REPUBLIQUE DU CAMEROUN

MINISTERE DE L'ENSEIGNEMENT SUPERIEUR

REPUBLIC OF CAMEROON

MINISTRY OF HIGHER EDUCATION

CAMEROON HIGHER NATIONAL DIPLOMA TRAINING PROGRAM

Volume 6

TERTIARY SECTOR
(continuation and end)



September 2018

TERTIARY SECTOR

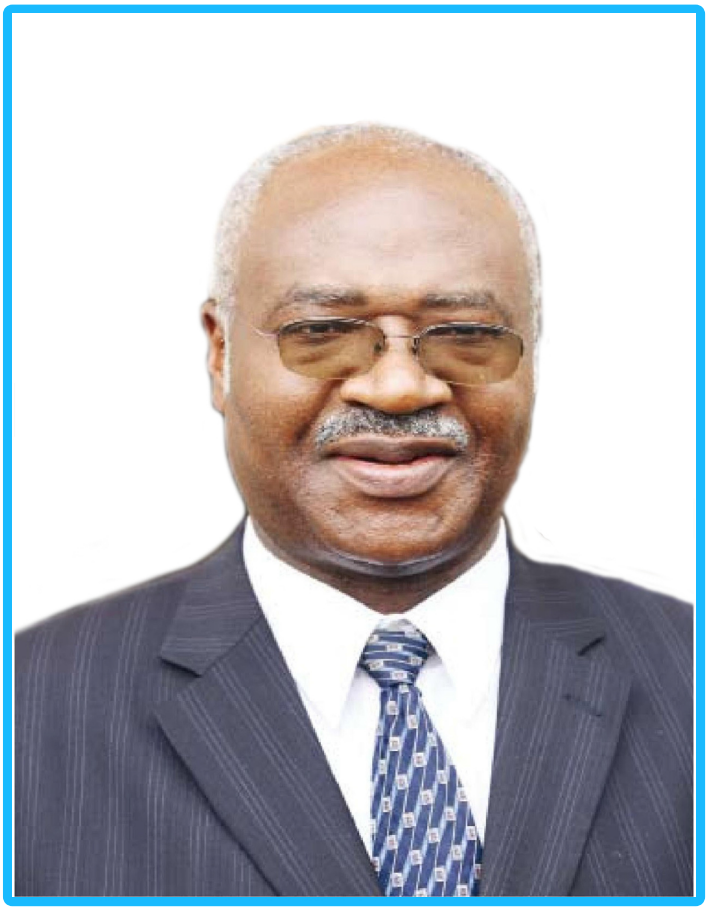
VOLUME 6



H.E. PAUL BIYA

President of the Republic of Cameroon,

”We need to radically transform the image of higher education in Cameroon”
(10th February 2008)



H.E. PHILEMON YANG

Prime Minister, Head of Government,

”In Higher Education, the Government is striving not only to increase and diversify training offers for the Cameroonian youth, but also to ensure quality, social relevance and professionalization of teachings. Furthermore, it is providing better working and living conditions to the members of the university community”

(26th November 2013)



Prof. JACQUES FAME NDONGO

Minister of Higher Education,
Chancellor of Academic Orders

”We must translate into reality the new vision of the University prescribed by the Head of State through far-reaching changes that seek, amongst other things, the improvement of the quality of university services in the areas of teaching and research, to make our universities more attractive and competitive at the national, sub-regional and international levels”

(Excerpt of the New Year Wishes Speech
at the University of Yaounde I, January 2010)

FOREWORD

Since November 2015, the Ministry of Higher Education has undertaken a vast and ambitious operation to review training programmes in the Brevet de Technicien Supérieur (BTS) and Higher National Diploma (HND) cycles. This initiative was incumbent on us as a categorical imperative since it became obvious that the programmes that were so far implemented had become obsolete because of the exponential evolution of the labour market.

If we recall that the programmes in question dated, most of them, as far back as 2001 and that they were developped as institutions and fields of study were set up, one easily understands why their review had become a must. Moreover, the advent of the BMD introduced innovations in our training and certification process that needed to be taken into account, especially as many BTS and HND holders now aspire to register in professional Bachelor's and Master's Degrees.

In order to reconcile this professional requirement with the legitimate need of students to pursue their academic programmes, we requested the support of three main stakeholders : representatives of the business world, teachers-experts from our universities and professional schools, proprietors/proprietresses of Private Institutions of Higher Education.

These three major stakeholders had the opportunity to brainstorm during the two (02) seminars we organized, the first took place on 28th November 2015 and the second on 16th march 2018, at the National Advanced School of Engineering of Yaounde I. The programmes that we are now putting at the disposal of the national university community is the fruit of their deliberations.

We can thus note that, thanks to this brainstorming, new fields of study emerged, others have been redesigned, while others have disappeared altogether, either because the labour market was already saturated, or because they had become inoperative. Trainings identified have been organized according to sectors of activity known to date : primary, secondary, tertiary and quaternary. Within these sectors, they have been divided into training areas, fields of study and specialties. We therefore have 7 major training areas, 21 fields of study and 130 specialties. These training areas have been grouped in a programme-document in 7 volumes, distributed as follows :

Volume 1 : Trainings of the Primary Sector (461 pages) ;

Volume 2 : Trainings of the Secondary Sector (356 pages) ;

Volume 3 : Trainings of the Secondary Sector (Continued) (514 pages) ;

Volume 4 : Trainings of the Tertiary Sector (627 pages) ;

Volume 5 : Trainings of the Tertiary Sector (Continued) (784 pages) ;

Volume 6 : Trainings of the Tertiary Sector (Continued) (572 pages) ;

Volume 7 : Trainings of the Quaternary Sector (246 pages).

The seven volumes put together make a total of three thousand five hundred and sixty (3560) pages, preceded by a statutory instrument to determine the system of studies and examinations of the Brevet de Technicien Supérieur.

All this arsenal is proof, if any were needed, that our educational and certification system is resolutely embarked on the quest for its effectiveness and social relevance. It is attentive to all innovations and adapts to the developments of our society.

Through this approach, we hope to meet the expectations of our partners and provide the nation with skills that it needs to achieve her emergence by 2035.

The Minister of Higher Education

Pr Jacques FAME NDONGO

REPUBLIQUE DU CAMEROUN
Paix-Travail-Patrie
****
MINISTERE DE L'ENSEIGNEMENT SUPERIEUR
****

REPUBLIC OF CAMEROON
Peace-Work-Fatherland
****
MINISTRY OF HIGHER EDUCATION
****

Order No. 18-00866/MINESUP/SG/DDES OF 02 NOV 2018 ESTABLISHING THE SYSTEM OF TRAINING, ASSESSMENTS AND SYLLABI FOR OBTAINING A HIGHER NATIONAL DIPLOMA (HND) IN THE REPUBLIC OF CAMEROON.

THE MINISTER OF HIGHER EDUCATION,

- Mindful of the Constitution.
- Mindful of law No. 2001/005 of April 16th, 2001 on the orientation of Higher Education.
- Mindful of decree No. 2011/408 of December 9th, 2011 to organize the government.
- Mindful of decree No. 2012/433 of October 1st, 2012 to organize the Ministry of Higher Education.
- Mindful of decree No. 93/026 of January 19th, 1993 to create Universities.
- Mindful of decree No. 93/027 of January 19th, 1993 laying down common provisions in state Universities modified and completed by decree No. 2005/345 of September 10th, 2005.
- Mindful of decree No. 2001/882/PM of September 10th, 2001 setting common rules applicable to the private institutions of Higher Education.
- Mindful of Order No.99/005/ MINESUP/DDES OF November 16th, 1999 to give the general depositions applicable to the organization of studies and the evaluation of State Universities of Cameroon.
- Mindful of Order No. 00/0007/MINESUP/SG/DDES/CJ of February 2nd, 2000 to create the National commission of Organization of the Higher National Diploma (HND) Examination.
- Mindful of Order No. 01/0014/MINESUP/DDES of February 26th, 2001 organizing the study schemes and evaluations and setting the study programme fields of the HND in the Republic of Cameroon.

ORDERS:

SECTIONI: GENERAL PROVISIONS

Article 1: This Order deals with the organization of studies, assessments and syllabi of the Higher National Diploma, abbreviated "HND" in Cameroon.

Article 2:(1) The HND is a national certificate of higher education which certifies an academic and technical qualification in two years or four semesters of study after the acquisition of the Baccalaureate Certificate or General Certificate of Education, Advanced Level.

(2) It certifies that the graduate can hold a position of a senior technician and can use his / her knowledge and skills to improve upon himself / herself or pursue university studies in his/her field of study.

(3) The HND shall indicate the sector, the field and the professional specialty in accordance with the training pursued by its holder;

Article 3: (1) The HND is defined by a standard that is characteristic of the professional and cross-disciplinary skills required to obtain it.

(2) The standard referred to in paragraph (1) of this article is defined by domain and for each field by an order from the Minister of Higher Education. It lists the abilities that the diploma holders must have, specifies the knowledge and skills that must be acquired and indicates the requirements needed to obtain the certificate.

Article 4: Only public or private institutions of higher education duly authorized by the Minister of Higher Education can provide courses preparing candidates for the HND.

SECTION II: THE ORGANIZATION OF STUDY

Article 5:(1) Studies for the HND must last two (2) academic years or four (4) semesters after acquisition of the Baccalaureate certificate, the General Certificate of Education, Advanced Level or any diploma or certificate deemed equivalent pursuant to Article (2) above at the end of Secondary Education.

(2) However, some training programmes may require one year of preparation or upgrading, without any modification of the academic base set in Article (2) above.

(3) Where necessary, a specific text of the Minister of Higher Education shall specify the training programmes referred to in paragraph (2) of this article.

Article 6: (1) The academic year is subdivided into two (02) semesters. A semester consists of fourteen (14) to sixteen (16) weeks dedicated to teaching and assessment.

(2) Each semester ends with an examination session comprising a regular session and a resit session open to students who fail in the regular session under conditions set by regulatory texts.

Article 7: (1) Courses taught in Higher Education Institutions are organised following a structured programme.

(2) One semester has seven (7) Courses (C) with a total of 30 credits.

(3) A Course is an identifiable group of objectives and outcomes called Constituent Elements (CEs) that are scientifically coherent and specific. Each Course has a value defined in number of adjustable credits based on the pertinence of the Constituent Elements.

(4) The Constituent Elements of a CU (CECU) comprise several forms of teaching: Lectures (L), Practical work (P), Tutorials (T), Student's Personal Work (SPW); activities applied in the form of internships in companies, projects, (remove) or end-of-study projects.

Article 8: (1) Credit is a value or unit that is used to quantify the total workload required for the student to achieve the training objective of a CU. The number of credits allocated to each semester is thirty (30) for all the CUs of the semester. The number of hours to be taught for a credit is fifteen (15) hours spread weekly in one semester.

(2) The credits are only obtained after work has been carried out, after an appropriate assessment either during a semester, or during a year, or at the end of the course.

Article 9: (1) The courses are structured into compulsory Courses and Elective courses.

(2) The compulsory CUs are the set of CUs that students enrolled in an HND cycle must offer. They constitute (90%) of credits of all the CUs of the training and (100%) of credits of the

official program published by the Minister of Higher Education and required for the National Examination. They are divided into three categories:

- The compulsory CUs linked to the discipline or disciplines corresponding to the field, representing (30%) of the overall hours taught and credits allocated to the compulsory CUs.

- Professional CUs organized around technical and professional contents representing (60%) of the overall hours taught and credits allocated to the compulsory CUs.

-Cross-discipline CUs linked to complementary training in different domains, representing (10%) of the hours taught and compulsory CU credits.

(3) Elective CUs organised by each institution per its specificity, allowing the student to deepen his specialization or explore to other fields of knowledge.

Article 10: The Higher National Diploma cycle is done in four (04) semesters. The hours taught for a lecture credit is 15 hours, a total of 30 credits per semester consist of 450 hours of courses per semester. There is a total of 120 credits making 1800 hours of lectures for all the training in 2 years, distributed as follows per semester:

a) Fundamental courses; 2 CU, 9 credits, 135 hours.
b) Professional courses; 4 CU, 18 credits, 270 hours.
c) Cross-discipline courses; 1 CU, 3 credits, 45 hours

Article 11: The teaching of French and English is compulsory throughout the training in accordance with the national decision on bilingualism. Likewise, the teaching of civics and ethical education is recommended throughout the training cycle.

Article12: The student is enrolled in a specialisation that he/she keeps throughout his/her training. He /She takes the cross-disciplinary lessons in general including classical aspects of the training.

Article 13: Practical lessons constitutes a decisive phase and is an indispensable base of the training.

SECTION III: INTERNSHIP IN A PROFESSIONAL MILIEU

Article 14: Each specialisation includes practical internships in companies. All HND candidates must complete an internship in a professional setting in one or more companies in the sector corresponding to their training.

Article 15: The internship in a professional setting aims at complementing the training of the candidate through the experience of professional practices corresponding to the skills required. It also allows the student to acquire qualities of rationality, professional aptitude and behaviours, and to develop a sense of responsibility by gradually adapting to the requirements of the job.

Article 16: (1) Internship in a professional setting is organized throughout the training leading to the HND. It constitutes an important and essential part of the student's training.

(2) No special provision may exempt an HND candidate from the obligation of carrying out an internship in a professional setting, referred to in paragraph (1) of this Article.

Article 17: (1) The search for companies or establishments to receive trainee students and the negotiation of the contents of the internship are carried out jointly by the student and the persons in charge of his/her training institution.

(2) The student's training institution is responsible in its entirety for the organisation of internship periods, their monitoring and their educational content.

(3) At the end of the internship, the candidate must produce an internship report.

(4) The institution must take all steps to find an internship for the student when the latter reports with evidence that his/her attempts to find an internship were unsuccessful.

Article 18: Internship in a professional setting is a Professional Course whose objectives and outcomes are considered in the assessments.

SECTION IV: TRAINING PROGRAM

Article 19: - The training to obtain the HND is structured into Sectors, Domains, Fields, Specialities and Options:

- A Sector consists of Domains;
-A Domain consists of Fields;
-A Field consists of Specialities from the same work-related group.
-A Speciality is a grouping of subjects forming a job profile required by the labour market.
-A Speciality may consist of options.

Article 20: The different sectors are as follows:

- Primary sector;
- Secondary sector:
- Tertiary sector;
- Quaternary sector.

Article 21: These sectors consist of the following domains:

-The primary sector includes the agro-pastoral domain, and the Water and Environmental domain.
-The secondary sector includes Industry and Technology.
-The tertiary sector includes the domains of Commerce, Management, Law, Tourism, Hospitality, Social Sciences, and Health.
-The quaternary sector includes the domains of Information and Communication Technologies

Article 22: (1) The following specialities are open in the following domains:

PRIMARY SECTOR
DOMAIN: AGRICULTURAL AND ENVIRONMENTAL SCIENCES

Field: Agricultural And Food Sciences
Specialties

1- Agricultural Engineering
2- Food Technology
3- Animal Production Technology

4- Crop Production Technology
5- Fisheries Management
6- Agro-pastoral adviser
7- Agro pastoral Entrepreneurship
8- Agricultural Business Technics
9-Aquaculture
10-Agricultural Production Technology

Field : Environmental Sciences
Specialties

1-Agro-Forestry and Forest Management
2- Nature Management and Protection
3-Risk Management
4-Pollution Prevention and Remediation
5- Meteorology
6- Solid Waste Management
7- Wildlife Management
8-Environmental Impact Assessment
9-Forest Engineering

Field :Water Engineering And Management
Specialties

1- Hydrology and Water Resources Management
2-Hydrogeology and Groundwater Management
3- Waste Water Management
4-Hydraulic Engineering and Water Infrastructure
5-Integrated Water Resource Management

SECONDARY SECTOR

DOMAIN: ENGINEERING AND TECHNOLOGY

Field: Civil Engineering

Specialties

1-Civil Engineering Technology
2- Topography
3-Urban Planning
4-Geotechnics
5-Sanitary Installation and Plumbing
6- Building Science and Technology
7- Wood Works
Options: 7-1-Carpentry
7-2- Joinery And Cabinetmaking
8- Real Estate Maintenance

9- Roads and Civil Engineering

Field:Mechanical Engineering Specialties

1-Metal Construction
2-Mechanical Manufacturing
3-Mechanical Construction
4- Boiler making and Welding

Field:Chemical Engineering Specialties

1-Chemical Manufacturing
2-Chemical Process Technology
3-Chemical Laboratory Technology

Field:Biological engineering Specialities

1-Agricultural Biotechnology

Field: Electrical and Electronic Engineering Specialties

1-Electronics
2-Electrotechnics
3-Electrical Power System
4- Maintenance of Industrial system
5-Maintenance of Biomedical Equipment
6-Control Instrumentation and Regulation

Field : Thermal and Energy Engineering Specialties

1-Air conditioning and Refrigeration
2-Sustenability and Renewable energy
3-Maintenance and management of fluid system

Field : Petroleum And Mining Engineering Specialties

1-Applied Geology
2-Drilling Technology
3- Quarries Operations
4- Petroleum Systems and Exploitation
5-Petroleum Logistics

TERTIARY SECTOR

DOMAIN: MANAGEMENT, BUSINESS STUDIES AND LEGAL CAREERS

Field : Management

Specialties

1- Assistant Manager
2-Operation of Air Transport
3- Management of Non-Governmental Organization (NGO'S)
4- Project Management
5- Human Resource Management
6- Quality Management
7- Logistics and Transport Management
8- Sport Management
9- Information Systems Management
10-Local Government Management
Options: 10-1 Accounting and Finance
10-2 Local Government Taxation
10-3 Local Government Administration
11- Statistics
12-Events Management
13-Port Shipping Management

Field: Business and Finance
Specialties

1-Accountancy
2-Marketing- Trade-Sale
3- Banking and Finance
4- International Trade
5-Microfinance
6-Insurance

Field: Legal Careers
Specialties

1- Legal Assistant
2-Business Law
3- Land Law
4-Stock Market Career
5-Customs and Transit .
6-Tax Management

DOMAIN: HOME ECONOMICS, TOURISM AND HOTEL MANAGEMENT,

Field : Home Economics and Social Work
Specialties

1- Bakery and Food Processing
2- Fashion, Clothing and Textiles
3-Beauty-Esthetics
Options: 3-1-Beauty care and Cosmetics
3-2 -Hairdressing Professions

4- Social Work

Field: Tourism and Hotel Management

Specialties

1-Tourism and Travel Agency Management
2- Hotel Management And Catering

DOMAIN: ARTS AND CULTURE, EDUCATION AND COMMUNICATION

Field: Education

Specialties

1-Didactics, Curriculum Development and Teaching
2-Education Management and Administration
3-Special Education
4-Distance and Continuing Education
5-Vocational Guidance and Counseling
6-Andragogy

Field: Communication

Specialties

1-Journalism
2-Advertisingand Public Relations
3-Corporate Communication
4-Printing, Editing and Publishing
5-Media photography and Audio visual

Field: Arts And Culture

Specialties

1-Gastronomic Arts
2-Cinematography
3-Sculpture
4-Caricature, Illustration and Comic Arts
5-Cartoon
6- Art Design
Options 6-1-Product Design
6-2-Graphic Design
6-3-Fashion Design
6-4-Interior Design
7-Performing Arts
8-Musicology
9- Painting

DOMAIN: HEALTH

Field : Medical and Biomedical Sciences

Specialties

1-Nursing
2-Medical Laboratory Sciences
3-Medical Imaging Technology
4-Pharmacy Technology
5- Dental Therapy
6-Dental Prosthesis
7-Midwifery
8-Optician/Clinical Optometry
9-Physiotherapy
10-Nutrition and Dietetics
11-Health Care Management
12-Health Sanitary Inspector
13- Ophthalmic Technician
14- Ultrasonography
15- Prosthesis and Orthotics

QUATERNARY SECTOR

DOMAIN: INFORMATION AND COMMUNICATION TECHNOLOGY

Field : Networks and Telecommunication

Specialties

1-Telecommunication
2-Network and Security

Field: Computer Engineering
Specialties

1-Computer Engineering
Options 1-1-Software Engineering
1-2-Computer Science and Networks
1-3-Data Base Management
2-Computer Maintenance
Option 2-1Hardware Maintenance
3-Industrial Computing and Automation
4-Computer Graphics and Web Design
5- E-commerce and Digital Marketing

(2) Other specialities and options may be created when the need arises, by Order of the Minister in charge of Higher Education.

SECTION V: ASSESSMENTS

Article 23 : (1) Courses are evaluated from 0 to 100.

(2) No one may be admitted to take a Course unless he has obtained an average score of at least 50 out of 100 for all the Constituent elements of the CU.

(3) Assessment is carried out per Course. The test may consist of several sections corresponding to the constituent elements of the CU.

Article 24: (1) Except for the professional internship CU, each CU is assessed as follows per level:

- Continuous assessment: 30% of the points
- Written examination: 70% of the points

(2) The continuous assessment mark includes marks for the following:

- Participation in tutorials and practical work;
- Written Tests
- Oral questions;
- Presentations;
- Projects.

(3) The professional internship Course includes at least two Constituent elements, one of which is dedicated to the company experience and the other to the end of training report and its defence.

Article 25: (1) Continuous Assessment marks are on the competence of each authorized teacher who teaches the corresponding course. At least one continuous assessment mark is required per course.

(2) The written examinations referred to in paragraph (1) of Article (24) above and all activities involved in evaluation per level are organized under the responsibility of the Management of each institution authorized to provide HND training and under the supervision of the Institution which ensures the academic supervision of the Institution concerned in accordance with the regulations in force.

(3) The transition from level 1 to level 2 is conditioned by a pass in all the CUs.

Article 26: (1) A National Examination taking place in a single annual session shall approve the completion of studies carried out in accordance with the provisions of this Order.

(2) The General Regulations of the National Examination for obtaining the Higher National Diploma are fixed when necessary by the Minister of Higher Education on the proposal of the National Commission for the Organization of National Examinations.

SECTION VI: TEACHING SYLLABUS

Article 27: The teaching syllabus of the training leading to the acquisition of the Higher National Diploma presented by sectors, domains, fields, specialities and possibly by options are annexed to this order.

Article 28: The effective opening of an HND training in an authorised public or private Institution for a field, a speciality or a given option, can occur only after a specific text of the Minister of Higher Education establishing teaching syllabuses of corresponding courses has been issued.

SECTION VII: FINAL PROVISIONS

Article 29: This order repeals all prior contrary provisions including Order No. 01/0014/MINESUP/DDES of 26 February 2001 organising the system of studies and assessments and setting the syllabus for HND courses in the Republic of Cameroon, as well as those of Order No. 05/0020/MINESUP of 12 January 2005 on the creation, system of studies, assessments and syllabi of the Higher Professional Diploma (HPD) of Higher Education Institutions of Cameroon.

Article 30: This order takes effect as of the 2018/2019 academic year.

Article 31: During the effective implementation of the new HND fields, the courses leading to HPD remain valid for a period of three (03) years.

Article 32: Heads of University Institutions, Heads of Authorized Institutions, the President of the National Commission for the Organization of National Examinations, the President of the National Commission for Private Higher Education and the Director of Development of Higher Education are responsible, in their respective spheres of competence for the implementation of this order which shall be registered and published in the official gazette in French and English.

THE MINISTER OF HIGHER EDUCATION,



Jacques Fame Ndongo

SUMMARY

FOREWORD 2

DOMAIN : **HEALTH**

Field : **MEDICAL AND BIOMEDICAL SCIENCES**

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MEDICAL IMAGING TECHNOLOGY 91

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DOMAIN

HEALTH

Field: MEDICAL AND BIOMEDICAL SCIENCES

Specialty:

NURSING

Field:	MEDICAL AND BIOMEDICAL SCIENCES

Specialty:	Nursing

1. The objective of the training

This training aims to put on the market in the employment of professionals able to analyze a situation of health, to make decisions within the limits oftheir competence and to conduct interventions alone or in a multidisciplinary team.

2. Required Skills

→ **Generic Skills**

- Be responsible, reflexive and relational ;
- Have adequate gestures and capacities;
- Develop adequate interpersonal and intrapersonal skills to be able to interact effectively with their patients, entourage and the health team
- Should be trustworthy and reliable;
- Have the capacity for critical thinking, analysis and questioning;
- Develop ethical values of a normal professional;
- Make thoughtful and informed decisions;
- Be able to act with autonomy and responsibility in his area ofcompetence.
- Master the computer tool and ICT

→ **Specific skills**

- Evaluate a clinical situation and establish a diagnosis in the Nursing field;
- Design and lead a project of Nursing;
- Accompany a person in the performance of daily health care ;
- Implement the actions towards diagnostic and therapeutic purposes;
- Initiate and implement the educational, preventive, curative and rehabilitative care;
- Communicate and conduct a relationship in a context of care;
- Analyze the quality of care and improve his professional practice;
- Be able to work with health information systems and related team;
- Organize and coordinate interventions among health caregivers;
- Be able to share knowledge and the skills with other health professionals.

3. Career opportunities

- Public Service;
- Privatehospitals and clinics;
- NGO (Non-GovernmentalOrganizations);
- Self-employment;
- The agri-food sector.

4. Organization of teachings

Semester 1

Field : Medical and Biomedical Sciences		Specialty: NURSING					
Course Code	Course titles	Number of hours					Number Of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
NUS111	Anatomy - Physiology I - Cell Biology - Histology - General Chemistry	60	24	0	6	90	6
NUS112	Microbiology I: Bacteriology - Parasitology - Biochemistry	30	12	0	3	45	3
Professional courses 60% (4 UC) 18 credits 270 hours							
NUS113	Sociology - anthropology and medical psychology	50	20	0	5	75	5
NUS114	The basis of the Science nurse I: Concepts and Theories in Nursing Sciences	44	10	0	6	60	4
NUS115	History of the Nursing profession (life cycle)	36	5	0	4	45	3
NUS116	Clinical Internship I (Medicine – General Surgery)	-	-	-	-	-	6
Transversals Courses 10% (1 UC) 3 credits 45 hours							
NUS117	Functional French and English	30	6	0	9	45	3
Total		**285**	**75**	**12**	**78**	**450**	**30**

Semester 2

Field : Medical and Biomedical Sciences		Specialty: NURSING					
Course Code	Course titles	Number of hours					Number Of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
NUS121	Anatomy and Physiology II	50	20	0	5	75	5
NUS122	Microbiology II (Virology - Mycology - Immunology)	40	16	0	4	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
NUS123	The foundations of science Nurse II - approach of Nursing care - Organization of Care targeted transmissions - First Aid	50	20	0	5	75	5
NUS124	Nursing care in medicine 1 - Ethics and Professional Ethics	40	13	0	7	60	4

NUS125	Public health: Epidemiology - Demography - Environmental Health and Health Promotion	30	10	0	5	45	3
NUS126	Medicine Course in paediatric I and II	0	0	70	20	90	6
Transversals Courses10% (1 UC3 credits 45 hours							
NUS127	Information and Communication Techniques - ICT	30	10	0	5	45	3
Total		**240**	**89**	**70**	**51**	**450**	**30**

Clinical internship

One month durind the academic year (240 hours =6CV, 1CV=40hours)

One month during holidays (240 hours =6CV, 1CV=40hours): Maternal and childcare

Semester 3

Field : Medical and Biomedical Sciences		**Specialty: NURSING**					
Course Code	**Course titles**	**Number of hours**					**Number Of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
NUS231	Applied Mathematics - Biostatistics - General biophysical and technology	50	20	0	5	75	5
NUS232	General pharmacology	40	16	0	4	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
NUS233	Nursing care in surgery and blood transfusion - Nursing in Pediatrics and Child Care	40	10	0	10	60	4
NUS234	Reproductive health: health mother - child - Obstetrical care - care to women suffering from obstetric pathologies gynecological	40	16	0	4	60	4
NUS235	Medical pathologies - infectious diseases and zoonoses, pediatric pathologies childhood	40	10	0	10	60	4
NUS236	ClinicalInternship III(obstecrical care : pre and post natal)	-	-	90	-	90	6
Transversals Courses10% (1course) 3 credits 45 hours							
NUS237	Medical French and English	30	10	0	5	45	3
Total		**240**	**82**	**90**	**38**	**450**	**30**

Semester 4

Field : Medical and Biomedical Sciences		Specialty: NURSING					
Course Code	Course titles	Number of hours					Number Of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
NUS241	Communication for behavior change(CBC) - Community Health - Health and Development	30	20	0	10	60	4
NUS242	Techniques of medical analysis laboratory - medical imaging techniques	25	20	20	10	75	5
Professional courses 70% (4 UC) 18 appropriation 270 Hours							
NUS243	Obstetrical pathologies gynecological	40	15	0	5	60	4
NUS244	Emergencies - operative Block - Anesthesiology	25		15	5	45	3
NUS245	Clinical Pharmacology - Nutrition and pathologies associated - Alternative Medicine	50	20	0	5	75	5
NUS246	Clinical Internship (Surgical ward and lab)	-	-	90	-	90	6
Transversals Courses10% (1 UC) 3 credits 45 hours							
NUS247	Civic education, Ethics and Initiation to research	30	10	0	5	45	3
Total		**200**	**85**	**125**	**40**	**450**	**30**

Semester 5

Field : Medical and Biomedical Sciences		Specialty: NURSING					
Course Code	Course titles	Number of hours					Number Of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
NUS351	Medical pathologies - priority health programs in Cameroon - CCC III	40	15	0	5	60	4
NUS352	The economics of health - Hospital management - system of health information	50	20	0	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
NUS353	Mental Health - Nursing in psychiatry - Nursing in geriatrics - Clinical Pharmacology 2 - Therapeutic monitoring	35	20	0	5	60	4
NUS354	Nursing care in resuscitation - care to	20	5	0	5	30	2

	persons with disabilities forces						
NUS355	Internship of Community Health II	0	0	70	20	90	6
NUS356	Clinical Internship (Intensive care – Neuro-geriartry)	0	0	70	20	90	6
Transversals Courses10% (1 UC) 3 credits 45 hours							
NUS357	Medical Law - Health at Work - School Medicine	30	10	0	5	45	3
Total		**175**	**70**	**140**	**65**	**450**	**30**

Semester 6

Field : Medical and Biomedical Sciences		**Specialty: NURSING**					
Course Code	**Course titles**	**Number of hours**					**Number Of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
NUS361	Technical care of specific 1 (neurology, ophthalmology, Stomatology, Dermatology - ENT)	30	0	40	5	75	5
NUS362	Techniques of specific care 2 - (Urology - Respiratory - Gastro-enterology- cardiology)	20	0	35	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
NUS363	Implementation professional situation 1 (MSP 1)	40	16	0	4	60	4
NUS364	Implementation professional situation 2 (MSP 2)	30	10	0	5	45	3
NUS365	Implementation professional situation 3 (MSP 3)	0	0	70	20	90	6
NUS366	Drafting of the research project (work of End of Studies)	50	0	20	5	75	5
Transversals Courses10% (1 UC) 3 credits 45 hours							
NUS367	Professional Ethics and Deontology	30	10	0	5	45	3
Total		**200**	**36**	**165**	**49**	**450**	**30**

5. Courses content

NUS111: Anatomy-Physiology I/Cell Biology-Histology/General Chemistry

- **Cell Biology - Histology: 1 credit (15 hours); L, T, SPW**

1. **Cell Biology and Histology**

- The cell:
  - Structure;
  - Multiplication;
  - Physiology;
- The tissue:
  - Epithelial tissue;
  - Connective tissue;
  - Nervous tissue;
- Concept of genetics.

- **Anatomy - Physiology I: 4 appropriations (60 hours); L, T, SPW**

1. **Nervous System**

- Histology of the central and peripheral nervous system;
- Physiology of the central and peripheral nervous system: nervous influx, transmission of the influx (chemical mediators, synapse, driving plate), arc reflex;
- Organization of the central nervous system and functional localization: spinal cord, and medulla oblongata, brain, meninges and CSF;
- System Device nervous, cranial nerves, plexus;
- Neuro-vegetative system: sympathetic and parasympathetic.

2. **The Endocrine System**

- Endocrine pancreas;
- Thyroid: anatomy - Histology - physiology;
- Parathyroids: anatomy physiology, metabolism of calcium;
- Adrenals: Histology Anatomy, Physiology.
- System hypothalamo-pituitary;
- The stimulines.

3. **Organ of meaning**

- The eye : the view;
- The ear: hearing and balance;
- Smell: Taste;
- Touch.

4. **System Musculoskeletal**
    - Ceos;
    - The osteites;
    - The osteomyelitis.
5. **Digestive System**
    - General topography;
    - The peritoneum;
    - Main categories of foods :
        - Energy needs;
        - Animal heat.
6. **Urinary system**
    - Structure and Physiology of the following organs: the kidney, the ureters, the urethra and bladder;
    - Excretory Role of the skin.

➢ **General Chemistry: 1 credit (15 hours); L, T, SPW**

1. Mixture and pure body
2. The major processes of immediate analysis
3. Simple body-to-body composed
4. Constitution of the material:atoms, molecules and ions
5. Chemical notation, symbol, Valencia, formula
6. The fundamental laws of Combinations: chemical equation, acids, bases, salts, concept of PH, equivalent, nomenclature, redox, degree of oxidation, catalysis.

NUS112: Microbiology I - Bacteriology - parasitology – Biochemistry

➢ **Microbiology - Bacteriology: 1 credit (15 hours); L, T, SPW**

1. **Introduction to the Bacteriology**
    - Place in the living world and ecological role of micro-organisms (saprophytes, commensalism, symbiosis and pathogens).
2. **General Bacteriology**
    - Structure of the bacterial cell, nutrition and growth, metabolism (anaerobic, aerobic conditions, fermentation), reproduction and genetics (genetic transfer, mutation), pathogenicity (notions of virulence, toxin).
    - BacterialEcology
    - Role of the field, reference mechanism of the host against the infection (Immunosuppression, opportunistic bacteria, nosocomial infections).

3. **Presentation of the bacterialsystematic**
4. **Study of the main species or bacterial groups pathogenic for man or likely to be**
    - Staphylococci, Streptococci, pneumococci, gonococcus, (history, habitat and epidemiology, fill pathogen, Bacteriological characters, diagnosis, treatment and prophylaxis).
5. **Bacteriological techniques**
    - Basic Techniques (microscopic examinations, insulation and identification), different types of levy in Clinical Bacteriology (technical and transport), methods of sterilization and preparation of media of cultures.
6. **Procedures for the sending of samples and of bacterial strains**
7. **Techniques of conventional identifications (1st part).**

➢ **Parasitology: 1 credit (15 hours); L, T, SPW**

1. Systematic study of human parasites, few definitions and concepts prior, mode of parasitism
2. Location of parasites
3. Epidemiology and evolutionary cycle
4. Parasitic disease: clinical description, pathology, defense of the body;
5. Prophylaxis (general and individual)

➢ **Biochemistry: 1 credit (15 hours); L, T, SPW**

1. Generality : enzyme, vitamin, a hormone
2. Basic concept of clinical biochemistry General: definition of a metering and exploration
3. Learning of normal and abnormal physiology of carbohydrates, lipids, proteins
4. Physiological study of different biochemical parameters of medical interest: techniques of biochemical assay and interpretation, normal values of biochemical constituents in biological fluids and pathological variations (1st part).

NUS113: Sociology -Anthropology and Medical Psychology

➢ **Sociology - Anthropology and Psychology : 6 credits (90 hours); L, T, SPW**

1. Sociology – Anthropology

- Introduction to the Sociology ;
- Concept of anthropology and ethnology;

- Evolution of life and of man in its dimensions biological, psychological and social assistance;
- Culture and cultural PWnomena,
- The innate, the acquis, myths and beliefs;
- Cultural attitudes to health, disease, death;
- Medical practices of yesterday, today alternatives and traditional medicine;
- Notions of group; social groups (family, working group, institution);
- Dynamics of small groups;
- Dynamics of Conflict (leaders);
- Communication and communication networks.

2. Psychology

- Introduction to Psychology
  - The major stages of life;
  - Emotional development, intellectual, psychomotor and psychosocial of the individual;
  - First Age, second age, age pre-school, school, adolescence, adulthood, aging;
- The Body: Body schema and body image
- The Personality
  - Dynamic aspect of the personality;
  - The unconscious;
  - Pulsion, refoulement;
  - Motivation.
- Mechanism of defense and of adaptation
  - Affective states : feeling - emotion - fear - anger - Distrust - a concern - Lines and behavior - the different modes of relationship;
  - Social: educative - cooperative - of authority - of dependency - of acceptance - of mothering;
  - The relationship between careers - Treated: specificities.

NUS114: Basis of Science nurse I: Concepts and Theories in Nursing Sciences

- **Concepts and Theories in Nursing Sciences: 2 credits (30 hours); L, T, SPW**

1. **Clarification of concepts**

- The health;
- The disease;
- Life;
- The death;

- The Continuum Health;
- Disease;
- The signs and symptoms;
- The need;
- The fundamentalneed;
- The concepts, the paradigm;
- The theories; - the models;
- The conceptualmodels.

2. **The Theories in Nursing Sciences**

- **The approach of Suzanne Kerouac**

  - The School of needs;
  - The school of the interaction;
  - The School of desired effects; - the School of the promotion of health;
  - The School of the human being unitary.

- **The thought of the autthors nursing**

  - Florence Nightingale;
  - Hildegard PEPLAN;
  - Martha Rogers;
  - Gerthud UJHELY;
  - Imogène King;
  - Nancy Roper;
  - Dorothy E. Orem;
  - Myra Levine;
  - Callista Roy;
  - AffefMelles;
  - Virginia Henderson;
  - Dorothy E. Johnson;
  - Marjory Gordon;
  - MC Gill;
  - Betty Neuman;
  - PENDER;
  - IDA Orlando;
  - Joyce Travelbee;
  - PARSE;
  - Leninger;
  - Laring Watson.

2. The Nursing care

- Toward a concept of Nursing;
- The categories and the components of care nurses.

3. The conceptual models in nursing

- Definition;
- Interest of conceptualmodels;
- Criteria for the choice of a conceptual model.

4. Study of the conceptual model of Virginia Henderson

- The components of the model:
  - the basic needs;
  - dependency, the independence;
  - Source of the difficulty.
- Table of analyzes of Virginia Henderson:
- Collection of data following the model of the Virginia Henderson.

5. Study of the conceptual model of Marjory Gordon

- Notions of 11 vital functions of the man;
- Mode of data collection according to the approach of Marjory Gordon.

NUS115: History of the Nursing Profession (Life Cycle)

➢ **History of the nursing profession : 1 credit (15 hours); L, T, SPW**

1. Health Among the primmitive peoples
   - Before JC;
   - In the middle Ages;
   - Of the XV to the VIII th century;
   - Since Florence Nightingale.
2. Currentorganization of Nursing
3. Role of the Nurse
4. History of the Nursing profession in Cameroon
5. The National Council of the order of professionals medico-sanitary
6. Overview On the other health professions
7. Presentation of the status of the body of the public health in Cameroon.

➢ **Life Cycle: 2 credits (30 hours); L, T, SPW**

1. Introduction to the growth and development
2. Prenatal stages, neonatal, childhood, adolescence and senescence
3. HumanGenetics
4. Inheritance and Counselling
5. The reproductive system of male and female infertility, male and female, mammary glands and lactation.

NUS116: Clinical Internship I (medicine – General Surgery)

- **Clinical internship I (Medicine – General Surgery): 6 credits (900 hours); P, SPW**
    1. Internship of nursing care in the service of medicine - Home - external care
    2. Internship of nursing care in surgery in the services of Surgery, Home - external care
    3. Internship of Nursing care in the paediatric services.

NUS117: Functional French and English

Objective: Upon completion of the course, the students should efficiently communicate with his/her colleagues and the patient in English and in French. Grammar, Conjugation, curriculum Vitae, Letter writing, reading Comprehension, Listening comprehension.Tenses. Also, besides grammar, a special emphasis should be placed on common vocabulary in the medical work.

Content:

- History and socio-cultural background of English in Cameroon
- Brief introduction to the structure of English
- Phoneme
- MorPWme
- Word
- Phrase
- Sentence
- Discourse
- Basic grammatic functionist
- Subject
- Object
- Grammatic categories: gender, personal number, count and non count nouns
- Spelling and punctuation
- Word formation
- Collocations
- Prepositions
- Some confusable works
- Synonyms, autonyms
- Figure of speech
- Idiomatic expressions
- Reported speech
- Difference between British and American English (pronunciation, grammar and vocabulary)
- Sound of English: in isolation and in connected speech
- Sentence stress and intonation

- Types of discourse: expository, descriptive, narrative
- Note taking (in lectures, in meetings)
- Turn taking conversational English
- Basic techniques of reading
- Basic techniques of writing
- Formal and informal letters
- Application for a job
- Administrative letters
- Invitations
- Writing CV
- Writing minutes of meetings
- General characteristics of the language in accordance with the area of specialization
- Technical writing
- Writing technical report
- Writing projects
- Writing technical instructions
- Summarizing documents
- Techniques in public speaking
- Techniques of negotiation

➢ **French : 1.5 credits (22 hours 30mn)**

Objective :

Ce cours de "French" a pour but de former des locateurs compétents pour pouvoir faire face à des situations courantes de communication en maîtrisant les différents paramètres de l'échange tels que le lieu, le temps, les interlocuteurs, les statuts de locateurs, les affectivités etc. Il vise également à amener les apprenants à être capable de comprendre et de produire à l'oral comme à l'écrit, des énoncés en langue française sur des sujets variés touchant leur domaine de prédilection, dont la médicine.

Indicative Content:

1. **Vocabulaire**
   - Introduction générale: apprendre ou ne pas apprendre le français? Pourquoi? Avantages et ouverture.
     - Saluer; se présenter quelqu'un
     - Demander une information; demander quelque chose, les sons [i], [j], [y], [w]; Demander une information, Proposer / accepter ou refuser une proposition; Demander une information; [m], [n], [ ] , Donner son opinion
     - Exprimer ses préférences; les sons [p], [b]
     - Préciser son identité; les sons [i], [y]
     - S'excuser et se justifier; le son [r], [ ], Dire l'heure
     - Parler de soi; les sons [u], [i], [y]; les sons [ ], [a]

- Caractériser les lieux (ce qu'on voit)
- Caractériser des personnes (ce que l'on voit) Identifier et caractériser des personnes
- Savoir téléphoner; communiquer, les sons [e], [ɛ], [ə], [ø]
- Exprimer ses besoins et ses goûts, ses préférences et les justifier les sons [9], [k], [ʃ], [3
- La négation; donner des ordres; répondre à des ordres.
- L'interrogation; proposer, accepter / refuser une idée les sons [s], [z], [t], [d],
- Medical French (medical terminologies in French).

2. **Grammaire**

- Du verbe : Conjugaison aux temps communément utilisés – présent, passé composé ; imparfait, futur, conditionnel, et plus-que-parfait, l'impératif, l'infinitif, voix passive ;
- De l'adjectif : Qualificatif, possessifs, démonstratifs, interrogatifs, numéraux, indéfinis ;
- Du nom et son article: masculin/féminin ; singulier/pluriel ; dénombrable, et non-dénombrable ;
- Du pronom : personnel, possessif, interrogatif, démonstratif, relatif, indéfini ;
- De l'adverbe et de la locution adverbiale : pour dire comment, où, quand et pourquoi ;
- Des fonctions grammaticales.

3. **Expression et communication**

- Compréhension et interaction au cours d'une discussion technique ;
- Communication orale courante ;
- Communication orale interactive
- De la phrase : simple, complexe, composée ; interrogative, déclarative, exclamative et impérative ;
- Lecture rapide et compréhension de texte ;
- synthèse d'un long texte
- De la communication : rédaction de texte, d'instructions, de rapport, d'une correspondance –d'une lettre recommandation ou de motivation, d'une, demande d'emploi, d'une demande d'explication, d'une réponse à une demande d'explication, d'un CV ;
- Gestion d'une table ronde/discussion : La prise de notes, la prise de parole
- Expressions figées

NUS121: Anatomy and Physiology II

- **Cardiovascular System: 1 credit (15 hours); L, T, SPW**

1. **The Heart**
   - Anatomy: configuring external and internal structure, histology of the heart muscle;
   - Physiology: automatism, revolution, noises of the heart, the electrocardiogram.
2. **The vessels**
   - Anatomy: arteries, veins: their structure, Anatomy of the large and the small circulation;
   - Circulatory physiology: blood pressure, venous circulation and capillary.
3. **The blood**
   - The plasma and dissolved substances, figurative elements, hematopoiesis, haemolysis; - Coagulation; - blood group.
4. **The reticulo-endothelialsystem**
   - Rate, lymphatic, thymus.

- **Respiratory system: 1 credit (15 hours); L, T, SPW**

1. **Anatomy**
   - Upper airway (anatomy endoscopy and non-surgical), nasal cavity, pharynx, larynx, trachea;
   - Bronchus, lungs, pleura, anatomy and histology.
2. **Physiology of breathing**
   - Mechanisms for regulating nervous;
   - Chemicalphenomena.

- **Digestive system: 1 credit (15 hours); L, T, SPW**

1. General topography; the peritoneum
2. The main categories of food

- Energy Needs;
- Animal heat.

- **Genito-urinary system (woman-man): 2 credits (30 hours); L, T, SPW**

1. Structure and Physiology of the following organs: the kidney, the ureters, the urethra and bladder
2. ExcretoryRole of the skin

3. Description anatomy and physiology of the genitalia of the Man and the woman

NUS122: Microbiology II (Virology - Mycology - Immunology)

- **Microbiology II (Virology - Mycology - Immunology): 4 appropriations (60 hours);L, T, SPW**

1. Characterization and classification of viruses and fungi
2. Infection, pathogenicity, virulence, exotoxicines and endotoxicines
3. Immune system: components, mode of action in the face of the antigen, active immunity, passive immunity, allergy.

NUS123: The Foundations of Science Nurse II - approach of Nursing care - Organization of Care targeted transmissions- First Aid

- **Approach of care: 1 credit (15 hours); L, T, SPW**

1. Analysis and interpretation of results
2. The concept of nursing diagnosis
3. Nursing intervention
4. File of nursing care

- **Planning care : 2 credits (30 hours); L, T, SPW**

1. The nurse throughout its activities, organizes and plans its actions in the permanent concern of the rules of hygiene and asepsis, of the economy and of the management of the stocks, the maintenance of the equipment and of the professional ethics;
2. Development of the plan of care (following the approach);
3. Preparation: application, monitoring of medical prescriptions;
4. Nurse prescription according to its responsibilities;
5. Basic care ;
6. Implementation of written therapeutic, dated, signed;
7. Participation in the functional explorations;
8. Emergency care, medical care, pre and postoperative care;
9. Application of the rules of hygieno dietary-;
10. Monitoring of medical prescriptions and side effects;
11. Relationship with the patient and his entourage, psychological support, IEC aid to the social support;
12. Execution of the administrative steps;
13. Oral transmissions and written of the actions undertaken in the folder of the Nursing;
14. Evaluations and readjustment of the actions undertaken.

- **First aid: 2 credits (30 hours); L, T, SPW**

1. The principles of first aid, injury, first aid in case of: accidents various (fractures, sprains, hemorrhages, burns, suffocation, poisoning, bite of beasts …)
2. Artificial Respiration
3. Cardiac massage
4. Transfer of injured.

NUS124 : Nursing care in medicine I - Ethics and Professional Ethics

- **Care in Medicine: 2 credits (30 hours); L, T, SPW**

1. Preparation of the patient's room
2. Rehabilitation of the bed, mode of installation of the patient
3. Hygiene, Comfort
4. Security and prevention of eschar
5. Organization of the truck
6. Technique of sampling, distribution of drugs
7. The protocols of the usual care (enemas, instillations, friction, massages and usual bandages, held of the sheet of temperature and transmission documents of care.

- **Ethics and Professional Deontology: 2 credits (30 hours); L, T, SPW**

1. Theoretical Bases of the ethics and the deontology
2. Philosophical Foundations of medical ethics and care
3. Values, beliefs, cultures, religions, standards, deviances
4. Respect for life and death, the concept of dignity, euthanasia, confidentiality
5. The professionalsecrecy
6. Ethics in the daily practice of care (case study from professional experience)
7. Right to the man
8. The right of the Child (child abuse)
9. The right of elderly persons, the Sick
10. Accompaniments of dying (palliative care)
11. The ethics of medical research and care, case study
12. Code of deontology of personal medico-sanitary.

NUS125: Public Health: Epidemiology - Demography - Environmental Health and Health Promotion

- **Epidemiology: 1 credit (15 hours); L, T, SPW**

1. Importance of the epidemiology, preventive care
2. Indices of community health in relation with the epidemiology

3. Analyticalmethods of demography
4. Program of investigation in Health
5. Epidemiological study of acute diseases and chronic conditions
6. Methodology and Statistics in the field of research
7. Analysis of the data
8. Introduction on the insects (brachycères, nematogeres, marangonins, arachnids malacology)

- **Demography: 0.5 credit (7.5 hours); L, T, SPW**

1. Definition
2. Purpose
3. The concepts of demography
4. The characteristics of the population
5. Concept of Gender, ratio, increased age pyramid
6. Stratification of the population
7. Interpretation.

- **Environmental Health: 1.5 credits (22.5 hours); L, T, SPW**

1. **Hygiene and Sanitation in the middle**
   - **Personal hygiene**
     - Physical (clothing, cleanliness, sport);
     - Mental (sleep, noise, addiction).
   - **Food Hygiene**
     - Food (balance, conservation);
     - Drinking water (domestic treatment of drinking water);
     - Addiction (tobacco, alcohol, drugs).
   - **Hygiene of the Environment**
     - Habitat (overcrowding, facilities, wastewater, waste);
     - Collective facilities.
2. **Hospital Hygiene**
     - Definition;
     - Importance;
     - Purpose;
     - Individual measures;
     - Collective measures Institutional and;
     - The nosocomial infection:

   - Definition;
     - Contributing factors;
     - Plan to Combat (organization of the fight);
     - Hygiene of the patient (toilet, bed linen, etc.);
     - Hygiene of the staff (held, hands);

- Hygiene of care and of the equipment of care (asepsis, antisepsis, decontamination, disinfection, methods and sterilization procedures physical and chemical);
- Specific hygiene in the surgical blocks;
- Remediation of the hospital environment (water, waste, facilities);
- Regulation of the movement of patients and staff in the hospital environment.

3. **The promotion of health**
    - Health Promotion;
    - Definition;
    - Different aspects;
    - Persons likely to participate;
    - The techniques of communications.

NUS126: Medicine Course in paediatric II

- **Medicine Course in paediatric II: 6 credit (90 hours); L, T, SPW**

1. Assess the needs of the Sick
2. Formulate the Nursing Diagnosis
3. Develop the plan of care
4. Make a dailyassessment
5. Administer the drugs in the time
6. Fill and ensure the follow-up of the medical file
7. Implementation of the protocols of care
8. Participation in continuous training

NUS127: Information and Communication Techniques – ICT

- **Techniques of Information and Communication 1**

1. Concepts and architecture of computers
2. Definitions: computing, information, computer, data, program, software, drivers
3. System of enumeration of base 2, the unit of measure of the information and its multiple
4. Components of the computer (hardware and software)
5. Study of an operating system
6. Study of a text treatment software: Microsoft Word
7. Study of a spreadsheet/Microsoft Excel
8. Study of a presentation software: Microsoft PowerPoint

- **Technique of information and communication 2**

1. Creation of a simple database with a spreadsheet (How to Give a name to a cell range)
2. Validation of Data in a range of cells on a spreadsheet

3. Creation of the statistical tables simple (modality, workforce, frequency) and automatic filling with functions such as NB, NB.If and NB.If.ENS, Average, Sum, if
4. Creation of graphics from statistical tables
5. Presentation and use of a statistical software (ex: Epi Info)
6. Creation of a questionnaire on EPI info or other
7. Data entry and analysis
8. Definition of the concepts of the computer network
9. Presentation of the types of media and networks
10. Presentation of Internet (Connection, research, download)
11. Networks withoutwires
12. Learning of a software application
13. Numbering system
14. Computer Security: Virus and antivirus

NUS231: Applied Mathematics -Biostatistics- General Biophysical and Technology

- **Applied Mathematics: 2crédist (30 hours); L, T, SPW**

1. **Descriptive statistics**
   - Variables;
   - Organization of data;
   - Description of data (tables and graphs);
   - Statistical Measures (Position parameters - dispersal parameters);
   - Representation of a distribution;
   - Act of distribution (binomial act - act of fish - normal law).
2. **Estimate**
   - Survey selection bias, raffle: the chance, random surveys, polls; empirical
   - Estimate of a parameter, estimate of an average unknown, an estimate of the percentage unknown, risk of error, size of a sample.

- **Biostatistics : 2 credits (30 hours); L, T, SPW**

1. **3e Part: statistical tests: Biostatistics (inferential)**
   - The principles of the tests; (Comparison test unto link test);
   - Comparison tests (Z-test or test of the gap reduces, Test of T Student- Test F of Fisher -Snedecor- chi-square test X^2 - Fisher exact Test not parametric or test of row);
   - Link test;
   - X^2 test of independence - X^2 Test of trend - correlation test – Regression

- Practical use of statistical tests

- **Biophysics and technology: 1 credit (15 hours); L, T, SPW**

1. Atomic Structure
2. The types of radiation
3. Wave Optical
4. Geometricaloptics
5. Physiological Optical

NUS232 : General Pharmacology

- **General Pharmacology: 4 credit (60 hours); L, T, SPW**

1. Definition, Origins of drugs
2. Studies of medicinalforms
3. The medical prescription: Writing and reading of a medical prescription
4. Measuringequipment and dosage
5. Routes of administration of drugs
6. Pharmacodynamics and Pharmacokinetics
7. Regulation and modalities of distribution of drugs
8. Classification of medicines, a concept of toxicity
9. Prescription and dispenNUSg of the drug to the hospital
10. Conservation and Monitoring
11. Drug intoxication

NUS233: Nursing care in surgery and blood transfusion - Nursing in Pediatrics and Child Care

- **Care in surgery: 1 credit (15 hours); L, T, SPW**

1. Definesurgery
2. Home and reception of the Sick
3. Installation of the sick
   - Comfort Care
   - Rehabilitation of the bed;
   - Positions of the sick.
4. Prevention of pressure sores
5. The identification of equipment of surgery
6. Identification of antiseptic and disinfectant
7. The bandages and the different types of Bands
8. Maintenance of equipment of surgery
   - Having served to a septic intervention;
   - Having served to an intervention aseptic.
10. Washing of hands

11. The types of dressing
    - Septic;
    - Sterile.
12. Protocol of the steps of a bandage.
13. The sutures of wounds and lesions
    - The different sutures.
14. The incisions
15. The plasters

➢ **Blood transfusion: 0.5 credit (7.5 hours); L, T, SPW**

1. The blood, hemostasis: the blood groups, the Cellular products and products derived from blood
2. The modes of collection of blood, conservation of blood products
3. Transfusion technique: Check transfusion pre, install products, blood transfusion safety, legislation relating to transfusion
4. The responsibility of the nurse vis-a-vis the blood transfusion

➢ **Care in Pediatrics: 1 credit (15 hours); L, T, SPW**

1. **General Care**
   - The nurse adapts its general knowledge to the specificities of the child to its status, its environment. It organizes a climate of security Parent - child unto caregiver.
2. **Care in neonatology**
   - Support for the premature in an incubator and the new-born; pathological
   - Hygiene of reinforced care;
   - Fight against the nosocomial infections;
   - Monitoring and maintenance of the brooder;
   - Prevention of complications, settings clinical signs;
   - IEC with parents.

➢ **Child care: 0.5 credit (7.5 hours); L, T, SPW**

1. Definitions
2. Issues of the national health strategy
3. Infant Development: Traction, awakening
4. Hygiene of the infant
5. Infant feeding (breast-feeding, weaning, diversified supply)
6. Vaccinations
7. Care Conceptualpre, prenatal, intra-partum, juvenile care and adolescents

8. The standards of family planning services: contraception, national strategy for the fight against AIDS/IST and opportunistic infections fertility, infertility
9. IEC and education for family life

- **Obstetrical care and gynecologic: 1 credit (15 hours); L, T, SPW**

1. **Prenatal Care**
   - **Prenatal Consultation**
     - Monitoring of pregnancy;
     - Search of edema, anemia, albumin, sugar;
     - Psychologicalpreparation for childbirth;
     - Preparation of the keychain of the mother and of the new-born;
     - Care in case of vomming, threat of abortion, hemorrhage.

NUS234: Health of reproduction: maternal and child health - Obstetrical care - care to women suffering from obstetric pathologies gynaecological

- **Family Planning (FP): 0.5 credit (7.5 hours); L, T, SPW**

1. Integration of the PF in the SSP
2. Nutritional surveillance of the mother and of the Child
3. Policy of breastfeeding
4. The standards of services of maternal and child health (MCH)

- **Intrapartum Care: 0.5 credit (7.5 hours); L, T, SPW**

1. Home and installation of the Nursing mother
2. Preparation of equipment
3. Monitoring the work (partogramme)
4. Normal delivrance

- **Post-partum care to: 0.5 credit (7.5 hours); L, T, SPW**

1. Care of the mother: vulva, perineum, breasts
2. Monitoring of the parameters and the risk of postpartum

- **Care of new-born: 0.5 credit (7.5 hours); L, T, SPW**

1. Immediate care: liberation of the respiratory tract, eyes, umbilical cord, toilet
2. Search for obvious malformations

- **Breast-feeding: 0.5 credit (7.5 hours); L, T, SPW**

1. Within the new-born
2. Lactogenesis

3. Maintenance of the lactation
4. Benefits and contraindications to breastfeeding

- **Artificial feeding: 0.5 credit (7.5 hours); L, T, SPW**

1. Disadvantages of breastmilk substitutes
2. Food diagram, withdrawal, ablactation
3. At the time of taking care of a Nursing mother, the nurse directs its actions on the IEC around the food hygiene, the rest of the mother and the home to the new-born

- **Gynecological Care: 1 credit (15 hours); L, T, SPW**

1. **Care are specific to gynecological pathologies, it is:**

- The care pre and post-operative of the gynecological surgery Breast and;
- Of the IEC, which will be oriented on the sexual education and on the risks of infertilities, after the gynecological infections neglected?

NUS235: Medical Pathologies - Infectious Diseases and Zoonoses Pediatric Pathologies Childhood

- **Infectious diseases and parasitic diseases: 2 credits (30 hours); L, T, SPW**

1. **Infectious pathologies**

- **Respiratory System**
  - Tonsillitis;
  - Tonsillitis;
  - Diphtheria;
  - Bronchitis;
  - Whoopingcough;
  - Pneumonia;
  - Broncho-pneumonia;
  - Pulmonarytuberculosis.
- **Cardiovascular System**
  - The pericardites;
  - The endocardites.
- **Digestive System**
  - Typhoidfever ;
  - Bacillarydysentery;
  - Cholera.
- **Genitourinary System,**
  - IST / AIDS;
  - The syphilis,

- The canker - Soft (chancrelle)
- The gonorrhea;
- Cystitis;
- The chlamydial infections.

- **MusculoskeletaLealth**
  - RAA;
  - The ostéites;
  - The osteomyelitis.
- **Otherinfectiousdiseases**
  - The tetanus;
  - Rabies;
  - The leprosy;
  - The cerebrospinalmeningitis;
  - The recurrentfevers;
  - Brucellosis;
  - The typhus exanthematic.
- **The Viral Diseases**
  - The parotitis ourlienne;
  - Influenza;
  - The AIDS;
  - Rubella;
  - The varicella;
  - The viral hepatitis;
  - Yellow Fever.

2. **ParasiticDiseases**

- Malaria;
- The trypanosomiases;
- The amoebicdysentery;
- The trichomoniasisuro-genital;
- The Intestinal parasitoses:
  - Ascaridiase;
  - Pinworms;
  - Trichuriasis;
  - Anguillulose;
  - Hookworm infections;
  - Taeniases;
  - Distomatoses;
- Other parasitoses:
  - Filariases;
    - The loase;

        - The dracunculiasis;
        - Onchocerciasis;
        - Filariasis to W. Bancroft;
    - The schistosomiases;
    - The intestinal flagelloses and uro-genital;
    - Hydatique cyst;
    - Toxoplasmosis;
    - Leishmaniasis;
    - The Gale.

- **Infectious pathology localized: 0.5 credit (7.5 hours); L, T, PW**

    - The wounds simple;
    - Infectedwounds;
    - The abscess (hot, cold, …);
    - The Furuncle and Carbuncle;
    - The paronychia;
    - The myositis, and pyomyosites;
    - The ulcer phagédénique;
    - The phlegmon sheaths;
    - The gas gangrene;
    - The lymphangitis.

- **Surgical pathologies: 0.5 credit (7.5 hours); L, T, PW**

    - Fractures, dislocation, sprains, burns;
    - The appendicitis, peritonitis, intestinal obstruction, the anus artificial, hernias, gastroduodenal ulcer punched, tumors, the ectopic pregnancy.

- **Pathologies by system: 1 credit (15 hours); L, T, PW**

1. Neurological pathologies

- Neurological pathologies and pharmacology;
- Comas, hemiplegia's, paraplegia's, epilepsy, SEP, abuses of the peripheral nerves (facial, sciatica), paralysis, brain tumor, cranial trauma.

2. Digestive pathologies

- Colic hepatic impairment;
- Abscesses and fistulas.

3. Cardiovascular pathologies

- The main diseases of the pericardium, the endocardium, myocardium, the pulmonary arteries;
- Infectious Diseases: genetic, degenerative diseases.

4. Urinary pathologies

- Nephrolithiasis;
- Urinary tract infection;
- Renalimpairment;
- Disorders of the Prostate;
- Renal tumors and visceral;
- Nephretiques colic.

5. Respiratory pathologies

- Main conditions of the pleura, pins, of the parenchyma, chest trauma.

6. Endocrine pathologies

- Of the pituitary gland;
- Thyroid;
- Parathyroids;
- The adrenals, pancreas;
- The ovariestesticles;
- Diabetesmellitus, diabetesinsipidus;
- Hypo and hyperthyroidism;
- Endemic goitre;
- Cushing's disease;
- Addison's disease.

NUS236 Clinical Internship3 (Obstetrical : Pre and Post Natal)

- **Clinical internship III: 6 credit (90 hours); L, T, SPW**

1. Internship of nursing care at the obstetrical services: Pre and Post natal

NUS237: Medical French and English

Objective: To develop communication skills in French and English language and thus enhance patient relationship as needed.

Content:

1. Grammar
2. Different parts of the human body
3. Conversation in French and English as specific to health care
4. Translation of Medical Terms, prescriptions, technical and protocol forms, drug dispensation notices
5. Drafting of reports
6. Documentation research
7. Use of data sheets and protocols in the French language.
8. Health structures, premises, equipment, professional categories
9. Drafting of researchtopics
10. Dissertation on the professional articles

11. Interviews - Speech unto etc. ….
12. Health structures, premises, equipment, professional categories
13. Hospitals
14. The Hardware
15. The staff
16. The Role
17. The pathologies
18. The drugs
19. **The pathologies by systems**
    - Urinary system;
    - Cardiovascular System;
    - Digestive system;
    - The endocrine system.
20. **The dispensing of drugs**

NUS241: Communication for Behavior Change (CBC) - Community Health - Health and Development

- **Communication for behavior change II: 1 credit (15 hours); L, T, SPW**

1. Determination of the health problems of a community
2. Prioritization criterion
    - Problems;
    - Behaviors,
    - Of the Forces.
3. Community balance
4. Development of a plan of action in community health
5. The techniques of communication
    - The meeting;
    - The group discussion;
    - The brainstorming;
    - The conference-debate;
    - The maintenance;
    - The counselling.

- **Community health: 2 credit (30 hours); L, T, SPW**

1. The man, its physical environment
2. Evaluation of the actions of the improvement of the quality of the Environment
3. Environmental factors affecting the health
    - noise, gas; pollution, waste, air, water.
4. Analysis of the health situation of the community
5. Health of the Environment
6. waste management;
7. Controls of vectors;
8. water supply;
9. Hygiene of the power supply;
10. Relations environmental factors and rural exodus.

- **Health and Development: 1 credit (15 hours); L, T, SPW**

1. Concept of Public Health
2. History and Evolution
3. Reorientation of primary health care (central level, intermediate, device, community participation, co-management, cost recovery, essential drugs, minimum package of activities)
4. The principles of care in public health
5. Organization of health services in Cameroon.

NUS242: Techniques of Medical Analysis Laboratory - Medical Imaging Techniques

- **Laboratory Techniques: 1 credit (15 hours); L, T, SPW**

1. Microbiological reminders
2. The microorganisms:
   o Bacteria;
   o Parasites;
   o Virus;
   o Fungi.
3. Appropriate tests for the implementation Evidence of microorganisms
4. The biological constants and their interpretation
5. The communication of the results of a laboratory exam.

- **Medical Imaging: 1 credit (15 hours); L, T, SPW**

1. Basic notions on the Radiation
2. Current Reviews and preparation of patients for a diagnostic radiology
3. Transit ulcer, barium enema, urography unto cholecystography, arteriography, scannography
4. For adiagnosis by ultrasound

5. For a diagnosis by nuclear magnetic resonance (NMR)
6. For a diagnosis by radioactive iodine
7. Radiation protection for personnel and patients.

NUS243 : Pathologies Obstetric and Gynecological

- **Obstetrical pathologies: 3 credits (45 hours); L, T, SPW**
    1. The obstetrics in its reports with the pathology medical-surgical
    2. Volmming gravidiques and pregnancy
    3. General classification of syndromes vasculorénaux-toxaemia of pregnancy outside of the paroxysmal accidents
    4. Eclampsia, haematomas retro-placental-apoplexy uteroplacental
    5. Urinary Tract Infections
    6. HearTHisease and pregnancy;
    7. Anemia and hematologicalmalignancies
    8. General infections and pregnancy: General Report Between General infections and pregnancy, means of preventive treatment (vaccinations) and curative treatment
- **Gynecological pathologies: 2 credits (30 hours); L, T, SPW**
    1. The obstetrics in its reports with the Gynecologic Pathology: uterine retroversion and pregnancy
    2. Fibroid tumors of the uterus and pregnancy
    3. Cysts of the ovary and pregnancy
    4. Malformation utero-vaginal and pregnancy
    5. Scaruterus and pregnancy
    6. Cancer of the cervix and pregnancy
    7. Infections of the genital tract and Pregnancy: genital track Bass, endométrites, salpingites, Tuberculosis

NUS244: Emergencies - Operating Block – Anesthesiology

- **Nursing care to emergencies: 1 credit (15 hours); L, T, SPW**
    1. Application of the general principles of nursing care to clients who need the care medico-surgical specialties
    2. The organization of the taking in charge of emergencies
- **Nursing care to the block operator: 2 credits (30 hours); L, T, SPW**
    1. The description of the operating block
    2. The trim of the Surgeon
    3. The washing of hands
    4. The storage of equipment
    5. Travel in the block; Neurosurgery
    6. Evacuation of haematomaunder duraux
    7. Extraduraux

8. Intra duraux, bypass CRL, cure of herniated disc
9. Bone transplantation
10. RDI

- **Nursing care in anesthesia: 1 credit (15 hours); L, T, SPW**

1. Definitions
2. The various types of anesthesia :
   - General anesthesias, by inhalation, by venous track;
   - Local anesthesia, locorégionales;
   - Spinal anesthesia;
   - The various phases of anesthesia;
   - Complications.
3. Pre care and postoperative

NUS 245: Clinical Pharmacology - Nutrition and pathologies assiocated - Alternative medicine

- **Clinical Pharmacology: 4 appropriations (60 hours); L, T, SPW**

1. Drugs of infectious diseases

- The antibiotics;
- The sulfonamides;
- The antiseptics;
- The anti-TB drugs;
- The antivirals;
- The Pest Control;
- The antifungals.

2. The drugs in the pain and inflammation:

- Analgesics;
- The anti inflammatory drugs;
- Corticosteroids.

- **Human Nutrition and pathologies associated: 2 credit (30 hours); L, T, SPW**

1. Nutrition

- Science of nutrition;
- Classification of food;
- Digestion relationship / absorption;
- Quality of foodpremises;
- Selection and formulation of balanced feeds;
- Use of Food tables;
- Daily needs for nutrients and calories; - food and life cycle,
- Dietetics and supply in pathology;
- Case Study;
- Nutritionaldiseases.

2. Nutritional pathologies

- Avitaminosis;
- The Drip and hyperlipidaemias;
- Obesity;
- Kwashiorkor;
- Slump.

NUS246: Clinical InternshipIV (Surgical Ward and Lab)

- **Clinical internship IV: 6 credits (90 hours); L, T, SPW**

1. Internship of nursing care in surgical ward
2. Internship in the laboratory of medical analyzes
3. Internship of nursing in operating block

NUS247 Civic education, Ethics and Initiation to Research

- **Ethics and Civic education: 2 credits (30 hours); L, T**

The Concepts

- The citizen;
- The Nation;
- The State;
- Publics Property and collective's goods;
- The freedoms;
- The public service;
- Ethics;
- Ethics, Law and reason;
- Ethical Problem ;
- Ethics and management.
- Civics
- Deontology
- Moral consciousness
- The universal declaration of Human Rights
- Good governance in public services
- The importance of civics to the life of the nation
- Functions of the state and its citizens
- Deontology, Professional ethics and professionalism
- Relationship between morality, law and ethics
- Codes of ethics

- **Initiation to research: 1 credits (15 hours); L, T, SPW**

1. Research in nursing
2. Sources of knowledge
3. Methods of reasoning

4. Stages of the research process (rational, assumptions, literature review, methodology, results/discussion, summary, bibliography)
5. Classification of research
6. Establishment of the Questionnaires
7. Ethics
8. Preparation and Presentation of Research Reports
9. Case practice: drafting of protocols of research

- **Construction of a Research proposal**: **Background:**

Literature review, formulating the problem statements, justification of studies, objectives, framing the questions according to general and specific objectives; is developing a testable hypothesis to achieve the objectives for quantitative research selection, referencing, etc.; Ethical considerations; Work plan: personnel; timetable project administration; Plans for dissemination.

Data collection and management: Design and Pretesting of measuring instruments (reliability and validity of instruments);training of interviewers; quality control of measurements; computerization, checking and validating, measurements; the issue of missing observations, statistical summarization of information; testing of hypothesis.

Analysis & presentation of Results; Report writing and format.

NUS351: Medical Pathologies - Priority Health Programs to the Cameroon - CBC III

- **The health programs in Cameroon : 2 credits (30 hours); L, T, SPW**

1. Malaria
2. Tuberculosis;
3. River blindness; etc.
4. Vaccination and ENP

- **CBC III (Communication for behavior change (III): 2 credits (30 hours); L,T, SPW**

1. **The educational program in health**
   - Definition ;
   - The components;
   - Elaboration.
2. **Monitoring and motoring an educational program**
   - Definition;
   - Principle;
3. **The supervision of an educational program in health**
   - Definition;
     - Supervision and motoring;
     - Why the supervision?
     - The steps of the Supervision;

- Supervision styles:
    - o Autocratic supervision;
    - o Anarchic Supervision,
    - o Democratic supervision;
- The benefits of the supervision.

4. **The evaluation of a health program**
   - Definition;
   - Type of Assessment;
   - The components (criteria) of the evaluation process;
     - The objectives;
     - The impact indicators;
     - The indicators of health coverage;
     - Community participation indicators;
   - Why assess;
   - How to assess;
   - Predictive Value and Program of struggle of a disease.

NUS352: The Economics of Health - Hospital Management System -Health Information

- **The economics of health: 2 credits (30 hours); L, T, SPW**

1. Basic concepts in health economics:
- The offer;
- The request;
- The financing of the health.

2. Concept of the market in health
- The supply of care;
- Request of care;
- Financing of care.

3. The funding to health
- Social protection;
- Pooling of the financing of the Health;

4. Financing of Health in Cameroon
- Community funding (CNPS, mutual health and system put in place by the state for public servants);
- Non-Community funding (budget of the ministries concerned, public health and other…);
- Bilateral and multilateral cooperation (NGOS, other donors …).

5. The Health Planning

6. Health system and theirassessment
- Effectiveness;
- Efficiency;

- Cost;
- Effectiveness/efficiency;
- Cost / efficiency.

➢ **Hospital management: 2 credits (30 hours); L, T, SPW**

1. HealthOrganization in Cameroon

- Mission of Health training on the national territory: health center, district hospitals, hospitals, central and regional, general hospitals, CHU, private hospitals and clinics laity and confessional, liberal medicine;
- Hospital reform, interŕrelation with national organizations that contribute to the health and the fight against poverty (other government departments, donors, international organizations, NGOS, associations).

2. Organization of health training, public and private

- Legislation which applies to health training;
- Economic and Financial Management;
- Workforce management, staff and the continuous training;
- Management of care and drugs.

➢ **Health Information System: 1 credit (15 hours); L, T, SPW**

1. Definition
2. Goals
3. Statisticalelements
    - Unit - Population, Sample ;
    - Sources of statistical data;
    - The statistical calculation.
4. The process of health information
    - Collection of data;
    - Media routing;
    - Treatment (counting, grouping, presentation);
    - Analysis and interpretation;
    - Retro-information and decision-making.

NUS353: Mental Health - Nursing in psychiatry - Nursing in geriatrics - Clinical Pharmacology 2 -Therapeutic Monitoring

➢ **Mental health and Nursing care in psychiatry: 1 credit (15 hours); L,T, SPW**

1. Worries and recklessness
2. Models of abnormalbehavior
3. Influence of the growth and development
4. Sociocultural practices and interpretation of mental health
5. Care of Persons of extinct mental pathologies

6. National Classification international and mental disorders
7. Specificbehaviors
8. Behavioral management
9. Role of the nurse
10. Legal coverage and preventive aspects of mental health

- **Geriatrics and care for the elderly: 1 credit (15 hours); L, T, SPW**

1. Psycho-social dimension of the geriatric patient

2. Geriatrics

- The types of aging;
- Aging of devices;
- The immune system;
- Nutritional problems of older persons;
- National Health Strategy in the field of policy of the elderly.

- **Clinical Pharmacology: 1 credit (15 hours); L, T, SPW**

1. Classification of psychotropicdrugs
2. Neuroleptics
   - Definition;
   - Classification;
   - Pharmacological effects;
   - Side effects.
3. Tranquilizers
4. The antidepressants
5. Mechanism of action and IEC
   - Chemotherapy;
   - Antiinflammatory;
   - Opioid Analgesics;
   - Corticosteroids.

- **Therapeutic monitoring: 2 credits (30 hours); L, T, SPW**

1. The anti infectives
2. The analgesic and anti-inflammatory
3. Pest control the
4. AntituberculosisDrugs
5. The antifungal agents
6. The diuretics
7. The digitalis glycosides
8. The anticoagulants
9. The Antihypertensive agents
10. Anticancer
11. Psychotropic substances
12. Principles of surveillance

o Therapeutic effect (Effectiveness of Treatment):

- Clinic;
- Biology;
- Paraclinical.

O Side effects:

- The route of administration;
- Intrinsic to medicine;

13. Advice to patients during treatment.

NUS354: Nursing care in resuscitation - Care to persons with disabilities forces

- **Resuscitation: 1 credit (15 hours); L, T, SPW**

1. Pathophysiology of fluid and electrolyte balance
2. Acido-basic
3. Nutritionalstatus
4. Pathophysiology of collapse, the shock, burns, poisoning chemical and drugs, coma; specialized nursing care
5. Implementation of quick action and conservatories
6. Preparation for and participation in the medical acts (intubation, trachea, cardiac massage, central catheter, stomach washing, the restoration of the blood volume)

- **Care of Persons with Disabilities Special: 2 credits (30 hours); L, T, SPW**

1. **The deficiencies psycho-mental, behavioral and cognitive or (DPIC/C)**
   - Definitions;
   - Aetiologies;
   - Examples;
   - Supported;
   - Device to help.
2. **Motor deficiencies**
   - Definitions;
   - Aetiologies;
   - Examples;
   - Supported,
   - Device to help.
3. **Sensory Disabilities**
   - Definitions;
   - Aetiologies;
   - Examples;
   - Supported;
   - Device to help.

4. **Visceral deficiencies**
    - Definitions;
    - Aetiologies;
    - Examples;
    - Supported;
    - Device to help.
5. **Deficiencies of presentation**
    - Definitions;
    - Aetiologies;
    - Examples;
    - Supported;
    - Device to help.
6. **Psychiatric disabilities**
    - Definitions;
    - Aetiologies;
    - Examples;
    - Supported;
    - Device to help;
    - Antisme.

NUS355: Internship in Community Health II

- **Internship Community Health II: 6 credits (90 hours); L, T, SPW**
    1. Integrate the community
    2. Make a study of the mid
    3. Do the Community balance
    4. Highlight the priorityproblems
    5. Prioritize the behaviors
    6. Develop a program of activity
    7. Run this program of activities
    8. The assess

NUS356: Clinical Internship V (Intensive Care – Neuro-geriartry)

- **Internship of clinical health V: 6 credits (90 hours); L, T, SPW**
    - **Internship in nursing:**
        - In Intensive Care;
        - Neuro-geriartry;

NUS357: Medical Law - Health at Work - School Medicine

- **Elements of labor law: 1 credit (15 hours); L, T, SPW**
    1. The sources of laborl aw
    2. The work contract

3. Collective labor relations

- **The elements of health at work: 1 credit (15 hours); L, T, SPW**

1. General information
2. Ergonomics of the work station
3. Prevention of work accidents
4. Hygiene of workers and of premises,
5. Medical surveillance of workers unto vaccination
6. IEC on the use of protective equipment (rear window, gloves, helmets, etc.)
7. Fight against alcoholism in the workplace.

- **Elements of school medicine: 1 credit (15 hours); L, T, SPW**

1. Definition and purpose
2. Medical examinations and school medicine the physical and psychological
3. The schooling of deficient, the disabled, children in difficulty
4. Control and Prevention of risks in the school environment
5. The schoolenvironment
    - Standards for the construction and installation;
    - Ergonomics of premises, the sanitary facilities;
    - Hygiene of the premises, food hygiene canteens;
    - The Infirmary in school environment;
    - The IEC in the school environment.

NUS361: Techniques for Specific Care 1 (neurology, ophthalmology, Stomatology, Dermatology - ENT)

- **Techniques of specific care 1: 5 credits (75 hours); L, T, SPW**

1. Nursing care in neurology

- Prevention of pressure sores;
- Participation in the laboratory examinations and functional Explorations (lumbar puncture, electroencephalogram);
- Monitoring of specificparameters.

2. Nursing care in ophthalmology

- Cataract;
- Glaucoma;
- Strabismus;
- Wound of the cornea;
- Myopia;
- Astigmatism ;
- Presbyopia.

3. Nursing care in stomatology

- Decay;
- Abscesses;
- Pyorrhée;
- Gingivitis;
- Infection of the oral cavity;
- Neoplasia;
- Mouthulcers.

4. Nursing care in ENT

- The tonsils;
- Vegetation;
- Cancer;
- Tracheotomy;
- Otitis and surgery of the inner ear;
- Surgery of the larynx.

NUS362: Techniques of specific care 2 (Urology - Respiratory - Gastro-enterology- cardiology)

- **Techniques of specific care 2: 4 appropriations (60 hours); L, T, SPW**

1. Nursing care for Urology disorders

- Bladderwashing;
- Bladdersurvey;
- Bladder instillation, monitoring of patients on dialysis.

2. Nursing care of disorders pneumologiques

- Aerosoltherapy;
- The humidifying;
- Postural drainage;
- Oxygen therapy,
- Pleural puncture,
- Pleural washing;
- Participation in reviews of functional exploration (saturation, spirometer….).

3. Nursing care for gastro-enterologic

- Gestures of emergency ;
- Participation in reviews of functional assessments (ultrasound, scintigraphy, electrocardiogram, explorers puncture).

4. Nursing care for cardiacdisorders

- Home;
- Gestures of emergencies;
- Fightagainst pain;

- The anguish ;
- Participation in the laboratory examinations and functional Explorations (ultrasound, scintigraphy, electrocardiogram, punctures explorers.);
- Application of specific treatments and their monitoring (pulse, blood pressure, integuments, diuresis, weight, edemas….);
- IEC on the rules of hygiene of life (physical activity, sport), and Dietetics (tobacco, alcohol, fats) in the prevention of cardiovascular diseases.

NUS363 : Implementation in the Professional situation 1 (IPS 1)

- **Implementation in the Professional Situation 1: 4 appropriations (60 hours); L, T, SPW**

1. Presentation of an approach to care or public health which will include
2. Elaboration of a project of care: capabilities expected during this first start in the professional situation (IPS1)
    - **Collect the data according to the guide provided to the student or used in the service**
        - Identify the person;
        - Talk to her or his entourage ;
        - Consult the service documents;
        - Refer to the referring caregiver.
    - **Analyze the data**
        - Classifying the data according to a model;
        - To establish links between the different elements.
3. Deduct the medical problems, nurses, psychosocial, of the patient

NUS364: Implementation in the professional situation 2 (IPS 2)

- **Implementation in the professional situation 2: 3 credits (45 hours); L, T, SPW**

1. Determination of objectives and / or the goals to achieve
2. Specify the actions to implement
3. Specify the means and / or the criteria to assess the achievement of objectives
4. Readjust in case of non achievement of objectives, after having identified the causes.

NUS365: Implementation in the professional situation 3 (IPS 3)

- **Implementation in the professional situation 3: 6 credits (90 hours); L, T, SPW**

1. Presentation of an approach to care or public health which will include

2. Elaboration of a project of care: capabilities expected during this first start in the professional situation (MSP1)
    - **Collect the data according to the guide provided to the student or used in the service**
        - Identify the person:
        - Talk to her or his entourage;
        - Consult the service documents ;
        - Refer to the referring caregiver.
    - **Analyze the data**
        - Classifying the data according to a model;
        - To establish links between the different elements;
        - Deduct the medical problems, nurses, psychosocial of patient;

            ✓ Argue the projects of itselfdoes:
            - Check the validity of the content that the student presents;
            - Understand the choices made by the student in regard to the regulation and / or the context;
            - Identify the capacity of the student to mobilize its knowledge and to establish links;
            - Explain, through cause-effect relationships for example, the links between problems and signs, problems and treatment; drugs and side effects;
            - Justify the choice of actions in the light of the problem and of the possibilities of the structure;
            - Evaluate the results obtained to wear of the criteria NUSce the beginning of the taken in care;

            ✓ Organize the Care:
            - Manage a group of sick and translmm the information relating to their taking into care;
            - Plan ;

            ✓ Achieve the Care:
            - Have the ability to establish a relationship with the people treated;
            - Have the ability to inform and educate;
            - Have the capacity to provide care techniques.

NUS366: Drafting of the Research Project (work of End of Studies)

- **Drafting of the research project: 5 credits (75 hours); L, T, PW**

(It depends on the theme of work of the learner; it must be drafted in accordance with the plan below)

1. Summary

2. Introduction: 2 pages maximum. The introduction, it is spring loaded to the problematic
    - One poses the question of research;
    - It sets the Assumptions;
    - On fixes the general objective;
    - It sets out the specific objectives and sets out the plan.
3. Chapter I, II: The literature review (Review of the literature)
4. Chapter II, III: The methodology
5. Chapter III, IV: Presentation of the results and discussion
    - Conclusion and Recommendations

NUS367: Professional Ethics and Deontology

Objective: At the end of the course, the student should be able to know those values and obligations which practice in the profession.
Content: Nurse, Patient, nurse/patient relationship, obligations of the nurse, rights of the patient, rights and responsibilities of the nurse, deontology, ethics, etiquettes, patient reception in hospital, nurse/patient-relative relationship. Medical jurisprudence, lab practice and the law, forensic nursing, malpractice, civic duties, organization of Government, Common law, labour law, Criminal Law,etc.

Health care Ethics

1. Morality and Ethics: Norms, Deviances, Religion, Values, Beliefs, Cultures
2. Bioethics
3. MLS Ethics
4. Moral Development
5. Ethical Principles: Autonomy, Freedom, Privacy, Confidentiality, Beneficence, Fidelity, Motivation, Justice, Veracity and Responsibility.
6. Code of Ethics health workers.
7. Application of Ethics to MLS Practice: Respect For Life And Death, The Concept Of Dignity, Euthanasia, Human Rights, Rights of The Child, Rights of The Elderly, Patients Rights
8. Ethical Decision Making Frameworks and their Application in diagnosis
9. Context And Conflicts With Bioethical Standards

Patient Rights:

10. Respect for life and death, the concept of dignity, euthanasia
11. Care for dying patients: Palliative care, Confidentiality, Professional secrecy, Medical Research and Nursing care ethics.
12. Code of ethics.

- HealthEmployee/employer contract law for health practitioners
- MLS and the law

Introduction to Law and Fundamental Rights

Law

- Sources of law
- Law and enabling Acts (text of application)
- The concept of legal personality
- Civil responsibility (contract, TORT)
- Criminal responsibility
- The court and their jurisdictions
- Labor law: formation and execution of labor contract, remuneration, condition of work, obligation of the employer and employee, termination of labor contracts

Fundamental Rights

- The concepts of human rights
- Sources of human right
- Major international conventions of human rights
- International conventions relating to women
- Children and the rights of the minorities
- The role of the judiciary and the legislative in the protection of human rights
- The Cameroon national commission of human rights and liberties
- The civil society NGO's and the protection of human rights

Law for Medical laboratory personnel

- Definition of Law, public law, private law
- The client's and MLS personnel's' constitutional right
- Administrative law related to licensing and regulation of health practice

Field: MEDICAL AND BIOMEDICAL SCIENCES

Specialty:

MEDICAL LABORATORY SCIENCES

Field:	MEDICAL AND BIOMEDICAL SCIENCES
Specialty:	**Medical Laboratory Sciences**

1. Objective of the training

This training aims to produce executives able to detect by laboratory tests, the various pathologies that can affect the human body.

2. Research Skills

→ **Generic skills**

- Receive or collect and check the biological sample and record the date, time of collection, patient details, etc ;
- Prepare the analyzers, the reagents and the biological sample (fractionation, distribution according to the type of analysis);
- Process the sample by centrifugation, dilution, heating, and monitor the progress of the analysis and record the data;
- Compare the results of the analysis with previous results, minimum values, maximum values and establish the report;
- Monitor the inventory status of consumables, establish replenishment orders and arrange the equipment according to their validity date and storage conditions;
- Check the operation of the analyzers, update the maintenance register and inform in case of malfunction;
- Disinfect, decontaminate, tidy the workstation and equipment;
- Proceed with the evacuation and disposal of waste.
- Master the computer tool and ICT.

→ **Specific skills**

- Perform biological analyzes on blood samples, secretions, tissues, urine, stools, etc
- Conduct biological analyzes in anatomo-cytopathology, bacteriology, Biochemistry, Parasitology, hematology, immunology / serology, virology;
- Check the feasibility of a biological sample and inform the patient about its progress;
- Take a blood sample, monitor the patient's reactions and intervene as needed
- Manage the stock of labile blood products in an establishment and supply the units of care;
- Conduct training actions within an organization.

3. Opportunities

- Public function;
- Hospitals and private clinics;
- NGO (Non Governmental Organizations);
- Self-employment;
- Agribusiness ;
- Occupational Medicine ;
- Research and training.

4. Organization of the Teachings

Semester 1

Field : Medical and Biomedical Sciences		**Specialty : Medical Laboratory Sciences**					
Code	**Courses titles**	**Hourly Volume**					**Number Of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental courses 30% (2UC) 9 credits 135 hours							
MLS111	Cell Biology and histology - Anatomy Physiology 1 -General Chemistry	70	12	0	8	90	6
MLS112	General Microbiology 1 - General biochemistry	32	8	0	5	45	3
Professional courses 60% (4 UC) 18 credits 270 hours							
MLS113	Sociology and anthropology, Medical - Medical Psychology - Ethics and Medical Ethics	44	10	0	6	60	4
MLS114	Life-cycle - Nursing - First Aid	42	8	6	4	60	4
MLS115	Physics- Mathematics - Biostatistics	40	14	0	6	60	4
MLS116	Clinical Internship 1(immersion)	0	0	70	20	90	6
TransversalsCourses10% (1 UC) 3 credits 45 hours							
MLS117	Functional English/ Functional French	30	9	0	6	45	3
Total		**258**	**61**	**76**	**55**	**450**	**30**

Semester 2

Field : Medical and Biomedical Sciences		Specialty : Medical Laboratory Sciences					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
MLS121	Anatomy and Physiology 2 - Organic Chemistry	60	22	0	8	90	6
MLS122	General Microbiology 2 - General Parasitology	28	6	6	5	45	3
Professional courses 60% (4 UC) 18 credits 270 hours							
MLS123	Techniques in the laboratory	30	2	10	3	45	3
MLS124	IEC 1- General hygiene and hospitable - Infectious and parasitic diseases	62	14	0	14	90	6
MLS125	General pharmacology - Nutrition - Epidemiology	34	6	0	5	45	3
MLS126	Clinical Internship 2(immersion)	0	0	70	20	90	6
Transversals Courses10% (1 UC) 3 credits 45 hours							
MLS127	General Economy - Demography	30	7	0	8	45	3
Total		**244**	**57**	**86**	**63**	**450**	**30**

Semester 3

Field : Medical and Biomedical Sciences		Specialty : Medical Laboratory Sciences					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
MLS231	IEC 2 - Health and Development - Community Health / Biosecurity/Quality management (ISO9001) / Environmental Management Sysem(ISO 1401)	65	20	0	20	105	7
MLS232	Initiation to research	20	4	0	6	30	2
Professional courses 60% (4UC) 18 credits 270 hours							
MLS233	Clinical haematology 1 - Medical Entomology - Blood Transfusion/ Quality Assurance	40	10	15	10	75	5
MLS234	Clinical Biochemistry 1 - Laboratory	30	6	20	4	60	4
MLS235	Clinical Bacteriology 1 - Laboratory	30	2	10	3	45	3
MLS236	Internship of community health 1/Hematology	0	0	70	20	90	6
Transversals Courses10% (1 UC) 3 credits 45 hours							
MLS237	Information and Communication Techniques	30	9	0	6	45	3
Total		**215**	**51**	**115**	**69**	**450**	**30**

Semester 4

Field : Medical and Biomedical Sciences		Specialty : Medical Laboratory Sciences					
Code	Courses titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
MLS241	Clinical Parasitology 1 - Medical Mycology - Immunology/serology	60	14	8	8	90	6
MLS242	The economics of health - a priority program of health in Cameroon	32	8	0	5	45	3
Professional courses 60% (4 UC) 18 credits 270 hours							
MLS243	Clinical Bacteriology 2 - Clinical Biochemistry 2 - Laboratory	30	4	20	6	60	4
MLS244	Clinical haematology 2 -The Laboratory	15	2	10	3	30	2
MLS245	Clinical Internship 3(parasitology/Immunology)	0	0	70	20	90	6
MLS246	Clinical Internship 4(serology/ Anapath/Histology	0	0	70	20	90	6
Transversals Courses10% (1 UC) 3 credits 45 hours							
MLS247	French and English for Medical profession and Law	30	10	0	5	45	3
Total		**167**	**38**	**178**	**67**	**450**	**30**

Semester 5

Field : Medical and Biomedical Sciences		Specialty : Medical Laboratory Sciences					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
MLS351	IEC3 - Health Information System - Health Management	60	12	0	18	90	6
MLS352	Rédactiondemémoire	15	0	0	30	45	3
Professional courses 60% (4 UC) 18 credits 270 hours							
MLS353	Clinical Parasitology 2 - Clinical Haematology 3 - Laboratory	40	8	45	12	105	7
MLS354	Clinical Bacteriology 3 – Laboratory - Virology	25	4	10	6	45	3
MLS355	Analytical Chemistry - Laboratory	15	4	5	06	30	2
MLS356	Internship of community health 2	0	0	70	20	90	6
Transversals Courses10% (1 UC) 3 credits 45 hours							
MLS357	Ethics and Civic education Law	30	9	0	6	45	3
Total		**185**	**37**	**130**	**98**	**450**	**30**

Semester 6

Field : Medical and Biomedical Sciences		Specialty : Medical Laboratory Sciences					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
MLS361	Microbiology of the environment - Food Microbiology	50	16	0	9	75	5
MLS362	Histopathology –Human Cytology	40	12	0	8	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
MLS363	Clinical Biochemistry 3 - Clinical Parasitology 3 - Laboratory	20	4	30	6	60	4
MLS364	Molecular Biology	20	6	0	4	30	2
MLS365	Clinical Internship 5(Biochemistry)	0	0	70	20	90	6
MLS366	Clinical Internship 6(MycoBacteriology)	0	0	70	20	90	6
Transversals Courses10% (1 UC) 3 credits 45 hours							
MLS367	Professional Ethics &Deontology	10	0	15	20	45	3
Total		**140**	**38**	**185**	**87**	**450**	**30**

5. Courses content

MLS111: Cell Biology and Histology - Anatomy Physiology 1 - General Chemistry

- **Cell Biology and histology: 1 credit (15 hours); L, T, P, SPW**

1. **The cell**
   - Structure
   - Multiplication;
   - Physiology.
2. **Thetissue**
   - Epithelial tissue;
   - Connective tissue;
   - Nerve tissue.
3. **Concept of genetics**

- **Anatomy - Physiology I: 4 appropriations (60 hours); L, T, P, SPW**

1. **Nervous System**
   - Histology of the central and periphral nervous system;
   - Physiology of the central and periPWral nervous system: nervous influx, transmission of the influx (chemical mediators, synapse, driving plate); CRA reflex;
   - Organization of the central nervous system and functional localization: spinal cord, and medulla oblongata, brain, meninges and CSF;
   - System Device nePWws, cranial nerves, plexus;
   - Neuro-vegetative system: sympathetic and parasympathetic.
2. **The Endocrine System**
   - Thyroid: anatomy histology unto unto physiology;
   - Parathyroids: anatomy physiology, metabolism of calcium;
   - Adrenals: Histology Anatomy, Physiology;
   - System hypothalamo-pituitary;
   - The stimulines.
3. **Organ of meaning**
   - The eye: the view;
   - The ear: hearing and balance;
   - The sense of smell;
   - The taste;
   - The touch.
4. **System Musculoskeletal**
   - Ceos;

- The ostéites;
- The osteomyelitis.

➢ **General Chemistry: 1 credit (15 hours); L, T, P, SPW**

1. Constitution of the subject, atoms, molecules and ions
2. Chemical notation, Symbol, Valencia, Formula
3. The major processes of immediate analysis
4. Simple body, body composed and mixing
5. The fundamental laws of Combinations: chemical equation, acids, bases, salts, concept of PH, equivalent, nomenclature, redox, degree of oxidation, catalysis

MLS112: General Microbiology I - General biochemistry

➢ **General Microbiology I: 1 credit (15 hours); L, T, P, SPW**

1. History of the microbiology and classification of micro-organisms
2. Introduction to the bacteriology: place in the living world and ecological role of micro-organisms, saprophytic, commensalism, symbiosis and pathogens
3. General bacteriology: classification, structure of the bacterial cell, nutrition and growth, metabolism (anaerobic, aerobic conditions, fermentation), reproduction and genetics (gene transfer, mutation), pathogenicity, notions of virulence, toxin
4. Bacterial Ecology: the role of the field, host defense mechanism against infection (immunosuppression, opportunistic bacteria nosocomial,)
5. Procedures for the sending of samples and of bacterial strains

➢ **General biochemistry: 2 credits (30 hours); L, T, P, SPW**

1. Generality: enzyme, vitamin, a hormone
2. Basic concept of clinical biochemistry General: definition of a metering and exploration
3. Learning of normal and abnormal physiology of carbohydrates, lipids, proteins
4. Physiological study of different biochemical parameters of medical interest: techniques of biochemical assay and interpretation, normal values of biochemical constituents in biological fluids and pathological variations (1st part)

MLS113: Sociology and Medical Anthropology- Medical Psychology - Ethics and Medical Deontology

- **Sociology and medical anthropology: 1 credit (15 hours) ; L, T, SPW**

1. Evolution of the man in his environment, the origin of the culture, myth, belief, religions
2. Cultural PWnomena in link with the dental problems
3. Cultural attitude in the face of the dental health, ethnology and ethno-pharmacy
4. Medical practices of yesterday, today, medicine alternatives and traditional medicines in link with the technical medical care and dental health
5. Chinese medicine, medicinal plants, homeopathies, manual practices, etc.

- **Medical Psychology: 1 credit (15 hours); L, T, SPW**

1. Study: behaviors, customs, food habits, environment of the communities
2. Organizations of the company: men in society (definition of the man, the individual, society), analysis of the life of a people
3. Professional Conduct of an agent of Health (laboratory technician): professional ethics, professional conscience
4. Approach of the lines in relation to the attitudes of the communities
5. Application of the psychology of groups of health

- **Ethics and medical deontology: 2 credits (60 hours); L, T, SPW**

1. **Civic training and ethics**
   - The citizen and the nation;
   - The State;
   - Public property and collective property;
   - The freedoms;
   - The public service;
   - Problem of ethics;
   - Ethics, Law and reasons;
   - Management and ethics of responsibility;
   - Ethics and management.

2. **Ethics and Medical deontology**
   - **Generality**
     - Ethics and Code of Conduct: Definition, theoretical basis;
     - Values, beliefs, culture, religion, Standard and deviances;
     - Respect for the life and the death, the concept of dignity, euthanasia;
     - Professional secrecy (definition and scope)and confidentiality;
     - Ethics in the daily practice of the techniques of medical analyzes (study cases from professional experiences); - Code of Ethics of the profession Laboratory Technician in Cameroon.

- **Professional Ethics**
  - Definition, purpose and importance of ethics for the laboratory technician;
  - Duty of health staff toward the hierarchical authorities, society, the sick, the collaborators, the profession and itself;
  - Right of the man (the child, the elderly and the patient);
  - Right of health personnel: protection and compensation;
  - Qualities of a good technician of medical analyzes: punctuality, attendance, effectiveness, obedience and goodness;
  - The sanction: legal, moral, happy, unhappy;
  - The legal aspects of the profession, the protection of the Analytical Report, Laboratory Manuals, the management of a laboratory and the computerized system of the laboratory.

MLS114: Cycle of Life - Nursing - First Aid

- **Life Cycle: 1 credit (15 hours); L, T, P, SPW**
  1. Introduction: embryological Terms
  2. Initial stages
  3. Gamete
     - 1St week of development;
     - 2th week of development (the embryo didermique);
     - 3th week of development (the trilaminar embryo).
  4. Embryonic period (the 4th week at the 7th week)
  5. Organogenesis and elements of teratology.
- **Nursing: 2 credits (30 hours); L, T, P, SPW**
  1. The injections
     - Intramuscular injections
     - Injections intra-venous thromboembolism, Subcutaneous Intradermal,
     - Installation of an infusion
     - Preparation of injection equipment
     - Accidents and Incidents of injections
     - Taken of the different parameters
     - IEC
  2. The usual dressings and bandage
     - Dry bandage: advantage and disadvantages technical unto unto equipment - IEC
     - Wet Dressings: advantage and disadvantages technical unto unto equipment - IEC
  3. Sterilization of equipment of care (decontamination, washing, cleaning)
  4. Washing and techniques of washing of hands

- **Practical work (06 hours)**

➢ **First aid Practice: 1 credit (15 hours); L, T, P, SPW**

1. Knowledge of first aid: history, objectives, use of emblems
2. Volunteering : rights and duties of the rescuer, first-aid attendant's role in the community
3. First relief to victims; general principles, clinical examination summary, gestures and techniques of first aid
4. First Aid in case of accident various (fractures, sprains, hemorrhages, burns, suffocation, poisoning, bite of beasts …)
5. Artificial respiration, heart massage and Transfer of injured.

MLS115: Physics - Mathematics – Biostatistics

➢ **Physics: 1 credit (15 hours); L, T, P, SPW**

- **Wave Optical:** electromagnetic wave, interference, diffraction, networks, diffusion, and polarization.
- **Geometrical optics:** reflection, refraction, notion of objects and optical images. Thin lenses. Dioptres plans and sPWrical.
- **Physiological Optical:** description of the eye. Accommodation. Amétropies of the eye (myopia, hyperopia, astigmatism). Visual acuity.
- **Instrumental Optical:** magnifying glass, microscope optical, electronic microscope, etc.
- **Corpuscular Optical:** photoelectric effect, level of energy of atoms and molecules.
- **Absorption and emission of light:** the act of Beer-Lambert, elementary notion of spectroscopy.

➢ **Mathematical: 1 credit (15 hours); L, T, P, SPW**

- **Analysis - function of a real variable:** percentage, rates, proportions, Rule of 3, equation 1 and 2nddegré, analysis and presentation of the functions, derived and differential, development in series, a study of usual functions (logarithm, exponential, power), graphic representation and application. - **Full calculation:** method of integration, integration Digital.
- **Differential Equation:** 1st-order equation (separable variable, homogeneous, linear); linear equations of the 2nd order, applications.
- **Functions in several variables:** derived partial and differential, calculation of error, method of least square.

➢ **Biostatistics: 2 credits (30 hours); L, T, P, SPW**

1. **Descriptive statistics**

- Descriptive statistics to one or two variables: measure of central tendency and dispersion.
- Graphical representation, diagram of dispersion.
- Correlation coefficient.
- The right of regression.
- Contingency table.
- Probability: elementary notion, functions of density theoretical and empirical, diagram quantile-quantile plots.
- Example of data in the sciences of life.

2. **Estimate**
   - Survey selection bias, raffle: the chance, random surveys, polls; empirical
   - Estimate of a parameter, estimate of an average unknown, an estimate of the percentage unknown, risk of error, size of a sample;

3. **InferentialStatistics**
   - Inferential Statistics: simple random sampling.
   - Central Liimm Theorem,
   - Estimate of the average and the proportion for large samples.
   - Experimental protocol simple.
   - Tests of hypotheses on an average and on a proportion.
   - Test of assumptions on a difference of two averages or of two proportions for large samples.
   - Practical use of statistical tests:

Comparison tests (Z-test or test of the gap reduces, Test of THeStudentŔ F-Test of Fisher unto Snedecor unto Chi-square test X^2 - Fisher Exact Test test not parametric or test of Row)

Link tests (test X^2 of independence unto X^2 Test of trend unto correlation test unto Regression)

- Use of statistical software.

MLS116: Clinical Internship 1(Immersion)

- **Clinical Internship 1: 6 credits (90 hours); P, SPW**

MLS117 : Functional English/ Functional French

Objective: Upon completion of the course, the students should efficiently communicate with his/her colleagues and the patient in English and in French. Grammar, Conjugation, curriculum Vitae, Letter writing, reading Comprehension, Listening comprehension.Tenses. Also, besides grammar, a special emphasis should be placed on common vocabulary in the medical work.

Content:

- History and socio-cultural background of English in Cameroon
- Brief introduction to the structure of English
- Phoneme
- MorPWme
- Word
- Phrase
- Sentence
- Discourse
- Basic grammatic functionist
- Subject
- Object
- Grammatic categories: gender, personal number, count and non count nouns
- Spelling and punctuation
- Word formation
- Collocations
- Prepositions
- Some confusable works
- Synonyms, autonyms
- Figure of speech
- Idiomatic expressions
- Reported speech
- Difference between British and American English (pronunciation, grammar and vocabulary)
- Sound of English: in isolation and in connected speech
- Sentence stress and intonation
- Types of discourse: expository, descriptive, narrative
- Note taking (in lectures, in meetings)
- Turn taking conversational English
- Basic techniques of reading
- Basic techniques of writing
- Formal and informal letters
- Application for a job
- Administrative letters
- Invitations
- Writing CV
- Writing minutes of meetings
- General characteristics of the language in accordance with the area of specialization
- Technical writing
- Writing technical report
- Writing projects

- Writing technical instructions
- Summarizing documents
- Techniques in public speaking
- Techniques of negotiation

- **French : 1.5 credits (22 hours 30mn)**

Objective :

Ce cours de "French" a pour but de former des locateurs compétents pour pouvoir faire face à des situations courantes de communication en maîtrisant les différents paramètres de l'échange tels que le lieu, le temps, les interlocuteurs, les statuts de locateurs, les affectivités etc. Il vise également à amener les apprenants à être capable de comprendre et de produire à l'oral comme à l'écrit, des énoncés en langue française sur des sujets variés touchant leur domaine de prédilection, dont la médicine.

Indicative Content:

1. **Vocabulaire**
   - Introduction générale: apprendre ou ne pas apprendre le français? Pourquoi? Avantages et ouverture.
     - Saluer; se présenter quelqu'un
     - Demander une information; demander quelque chose, les sons [i], [j], [y], [w]; Demander une information, Proposer / accepter ou refuser une proposition; Demander une information; [m], [n], [ ] , Donner son opinion
     - Exprimer ses préférences; les sons [p], [b]
     - Préciser son identité; les sons [i], [y]
     - S'excuser et se justifier; le son [r], [ ], Dire l'heure
     - Parler de soi; les sons [u], [i], [y]; les sons [ ], [a]

   - Caractériser les lieux (ce qu'on voit)
   - Caractériser des personnes (ce que l'on voit) Identifier et caractériser des personnes
   - Savoir téléphoner; communiquer, les sons [e], [ɛ], [ə], [ø]
   - Exprimer ses besoins et ses goûts, ses préférences et les justifier les sons [9], [k], [ʃ], [3
   - La négation; donner des ordres; répondre à des ordres.
   - L'interrogation; proposer, accepter / refuser une idée les sons [s], [z], [t], [d],
   - Medical French (medical terminologies in French).
2. **Grammaire**

- Du verbe : Conjugaison aux temps communément utilisés – présent, passé composé ; imparfait, futur, conditionnel, et plus-que-parfait, l'impératif, l'infinitif, voix passive ;
- De l'adjectif : Qualificatif, possessifs, démonstratifs, interrogatifs, numéraux, indéfinis ;
- Du nom et son article: masculin/féminin ; singulier/pluriel ; dénombrable, et non-dénombrable ;
- Du pronom : personnel, possessif, interrogatif, démonstratif, relatif, indéfini ;
- De l'adverbe et de la locution adverbiale : pour dire comment, où, quand et pourquoi ;
- Des fonctions grammaticales.

3. **Expression et communication**

- Compréhension et interaction au cours d'une discussion technique ;
- Communication orale courante ;
- Communication orale interactive
- De la phrase : simple, complexe, composée ; interrogative, déclarative, exclamative et impérative ;
- Lecture rapide et compréhension de texte ;
- synthèse d'un long texte
- De la communication : rédaction de texte, d'instructions, de rapport, d'une correspondance –d'une lettre recommandation ou de motivation, d'une, demande d'emploi, d'une demande d'explication, d'une réponse à une demande d'explication, d'un CV ;
- Gestion d'une table ronde/discussion : La prise de notes, la prise de parole
- Expressions figées

MLS121: Anatomy and Physiology 2 - Organic Chemistry

- **Anatomy and Physiology 2: 5 credits (75 hours); L, T, P, SPW**

1. **Cardiovascular System**
   - **The Heart**

     - Anatomy: configuring external and internal structure, histology of the heart muscle;

     - Physiology: automatism, revolution, noises of the heart, the electrocardiogram.

   - **The vessels**

     - Anatomy: arteries, veins: their structure, Anatomy of the large and the small circulation;

     - Circulatory physiology: blood pressure, venous circulation and capillary.

- **The blood**
  - The plasma and dissolved substances, figurative elements, hematopoiesis, haemolysis; - Coagulation; - blood group.
- **The reticuloendothelialsystem**
  - Rate, lymphatic, thymus.

2. **Respiratory system: 1 credit (15 hours); L, T, SPW**

- **Anatomy**
  - Upper airway (anatomy endoscopy and non-surgical), nasal cavity, pharynx, larynx, trachea;
  - Bronchus, lungs, pleura, anatomy and histology.
- **Physiology of Breathing**
  - Mechanisms for regulating nervous;
  - Chemical phenomena.

3. **Digestive system**

- General topography; the peritoneum
- The main categories of food
  - Energy Needs;
  - Animal heat.

4. **Genito-urinary system**

- Structure and Physiology of the following organs: the kidney, the ureters, the urethra and bladder
- Excretory role of the skin
- Description anatomy and physiology of the genitalia of the Man and the woman

➢ **Organic Chemistry : 1 credit (15 hours); L, T, P, SPW**

1. **Fundamental Concepts**

- Tetravalence of carbon;
- Carbon Chain linear cyclic;
- Concept of isometry;
- Nomenclature.

2. **General concepts on**

- The saturated hydrocarbons: methane;
- Unsaturated hydrocarbons: ethylene, acetylene;
- The aromatic hydrocarbons: chloroform;
- The halogen derivatives of hydrocarbons TRICHCMOROETHYLENE ;
- The alcohols methanol, ethanol;
- The PWnols;
- The aldehydes: formaldehyde;
- The ketones: acetone;
- The organic acids: acetic acids;
- The amines, methylamine;

- The acids: aniline.

3. **Simple concepts on the compounds multifunctional: Acids Alcohols, PWnol Acids, amino acids, etc.**

MLS122: General Microbiology 2 - General Parasitology

- **General Microbiology 2: 1 credit (15 hours); L, T, P, SPW**

1. Presentation of the Yeast/fungi of medical interest
2. Structure and identification of the yeasts
3. The different types of parasites and their hosts
4. Identification, nomenclature and classification of parasites

- **General Parasitology: 2 credits (30 hours); L, T, P, SPW**

1. Systematic study of human parasites, few definitions and concepts prior, mode of parasitism
2. Location of parasites
3. Epidemiology and evolutionary cycle
4. Parasitic diseases: clinical description, pathology, defense of the body. Prophylaxis
5. Classification of protozoa, of the PlatyhelmiNTDes, nematodes and trematodes: signs and symptoms, diagnostic techniques, treatment and prophylaxis
6.

- **Practical work (06 Hours)**.

MLS123: Techniques in the laboratory

- **Techniques in the laboratory: 3 credits (45 hours); L, T, P, SPW**

1. Technology and instrument

- Generality;
- Presentation of the different devices on the medical analysis laboratory;
- Study and application of the principles, techniques and basic instruments used in the laboratory on the pipetting of precision, scales, separation methods, microscopes, the PH-meter, type of water and the preparation including the notion of glassware and plastics;
- Safety in the laboratory.

2. The sampling techniques

- Concept of ethics relating to the collection;
- Hygiene of the levy, rule of aseptic;

- Home of the patient, registration of the patient, compendium of information clinic, assurance of compliance with the conditions prior to the good realization of the levy and the review;
- Knowledge of laboratory examinations: the choice of the appropriate equipment and conditions necessary prerequisites for a good collection;
- Preparing the Work station and the sample collection equipment;
- Anatomical data-physiological and points of collection;
- The different types of removal of organic products and pathological products: blood, cervico-vaginal uretral,, urine, pus and ulceration sputum, skin, etc.
- The sampling techniques for the completion of the reviews current and Special:Protocols, because of errors, security and prevention of complications.

3. Work Practices (10 Hours)

MLS124: IEC 1- General hygiene and hospitable - Infectious and parasitic diseases

➢ **IEC 1: 1 credit (15 hours); L, T, P, SPW**

1. Generality
2. Promotion of Health; definition, different aspects, persons likely to participate unto the techniques of communications
3. The concepts of the IEC
4. Principles and methods of communication
5. Means and levels of communications
6. The methods of assessment of the nutritional status of populations 7. Food ration of the different groups of individuals

➢ **General hygiene and hospitable: 2 credits (30 hours); L, T, P, SPW**

1. **General hygiene**

- Personal hygiene and dress hygiene;
- Food hygiene and hygiene of the habitat.

2. **Hospital hygiene**

- **General principles:**

- Epidemiology;
- Sources and vehicles;
- Contaminants;
- Mode of transmission.

- Development of a hospital

- Monitoring and reporting of any infection;
- Removal of Contamination;

- Architectural consideration;
- Bacteriological control.

- Role of the bacteriologist in the fight against the hospital infection
  - Personal hygiene and the collection, transport and treatment of samples;
  - Treatment of residues;
  - Washing and sterilization of equipment;
  - Collaboration with the other services;
  - General hygiene of the service of medical analysis.

➢ **Infectious and parasitic diseases: 3 credit (45 hours); L, T, P, SPW**

1. Infectious Diseases

2. **Infections Infectious Diseases**
   - The wounds simple;
   - Infected wounds;
   - The abscess (hot, cold, …);
   - The Furuncle and Carbuncle;
   - The paronychia;
   - The myositis, and pyomyosites;
   - The ulcer phagédénique ;
   - The phlegmon sheaths;
   - The gas gangrene;
   - The lymphangitis.

• **The generalized infections**

- Septicemia;
- The infectious shock.

• **Infectious Bacterial Diseases**

✓ <u>Respiratory device</u>

- Tonsillitis; - Diphtheria;
- Bronchitis ;
- Whooping cough;
- Pneumonia;
- Broncho-pneumonia;
- The pulmonary tuberculosis.

✓ <u>Cardiovascular System</u>

- The péricardites;
- The endocardites.

✓ <u>Digestive System</u>

- Typhoid fever;
- Bacillary dysentery;
- The cholera.

✓ <u>Genitourinary System,</u>

- Aids/IST;
- The syphilis,
- The canker-Soft (chancrelle);
- The gonorrhea;
- - Cystitis;
- - The chlamydial infections.

✓ Musculoskeletal Health

- Ceos;
- The ostéites;
- The osteomyelitis.

• **Other infectious diseases**

- The tetasin;
- Rabies ;
- The leprosy;
- The cerebrospinal meningitis;
- The recurrent fevers;
- brucellosis;
- Louse-borne typhus.

• **The Viral Diseases**

- The parotitisourlienne;
- Influenza;
- The AIDS;
- Rubella;
- The varicella;
- The viral hepatitis;
- Yellow Fever.

2. Parasitic diseases

- Malaria;
- The trypanosomiases;
- The amoebic dysentery;
- Trichomoniasisuro-genital;
- The Intestinal parasitoses:
    - Ascaridiase;
    - Pinworms;
    - Trichuriasis;
    - Anguillulose;
    - Hookworm;
    - Taeniases;
    - Distomatoses.
- Other parasitoses:
    - Filariases:
        - The loase;

- The dracunculiasis;
- Onchocerciasis;
- Filariasis to W. Bancroft.

- The schistosomiases;

o The intestinal flagelloses and uro-genital;

- Hydatique cyst;
- Toxoplasmosis;
- Leishmaniasis;
- The Gale.

MLS125: General Pharmacology - Nutrition – Epidemiology

- **General Pharmacology: 1 credit (15 hours); L, T, P, SPW**

1. Definition, Origins of drugs
2. Studies of medicinal forms
3. The medical prescription: Writing and reading of a medical prescription
4. Measuring equipment and dosage
5. Routes of administration of drugs
6. Pharmacodynamics and Pharmacokinetics
7. Regulation and modalities of distribution of drugs
8. Classification of medicines, a concept of toxicity
9. Prescription and dispensing of the drug to the hospital
10. Conservation and Monitoring
11. Drug intoxication

- **Nutrition: 1 credit (15 hours); L, T, P, SPW**

1. Definition, Origins of drugs
2. Science of nutrition
3. Classification of Food
4. Digestion relationship / absorption
5. Quality of local food
6. Selection and formulation of balanced feeds
7. Use of Food tables
8. Daily needs for nutrients and Calories
9. Food and life cycle
10. Dietetics and supply in pathology
11. Case Study
12. Nutritional diseases : voimming of the infant, acute diarrhea of the infant, deshydration of the infant, chronic diarrhea, constipation and the intestinal invagination in acute

- **Epidemiology: 1 credit (15 hours); L, T, P, SPW**

1. Definition of the concepts and importance of the epidemiology, preventive care
2. Indices of community health in relation with the epidemiology
3. Analytical methods of demography
4. Program of investigation in Health
5. Epidemiological study of acute diseases and chronic conditions
6. Methodology and Statistics in the field of research
7. Analysis of the data.

MLS126: Clinical Internship 2(Immersion)

- **Clinical Internship 2: 6 credits (90 hours); P, SPW**

MLS127: General Economy – Demography

- **General Economy: 2 credits (30 hours); L, T, SPW**

1. **Facts and economic thoughts:**
   - The major facts of the economic history;
   - The major schools of economic thought.

2. Markets and Prices

- The behavior of the producer: technology and cost of production, supply function;
- Consumer behavior: a function of request;
- Analysis of the markets and price formation.

3. **Currency and financing of the economy**

- Creation and measurement of the currency;
- Monetary institutions and financial resources;
- Capital markets.

4. International economic relations

- Areas of economic exchanges;
- Specialization and international trade;
- International payment;
- European construction.

5. The economic policies

- The objectives: growth, employment, prices, external trade;
- The means: Policies fiscal, monetary, industrial and employment policy and training.

6. Economic circuit and national accounting

- Institutional sectors, flow accounts, table (table of the whole economic activity,Table Input/Ouputs, Table of Financial Operations), aggregates and ratios;

- Evolution of the final consumption, gross fixed capital formation (GFCF) and savings.

- **Demography: 1 credit (15 hours); L, T, P, SPW**

1. Definition of concepts Demographics
2. Definition
3. Purpose
4. The concepts of demography
5. The characteristics of the population
6. Concept of Gender, ratio, increased age pyramid
7. Stratification of the population.

MLS231: IEC 2 - Health and Development - Community Health

- **IEC 2: 2 credits (30 hours); L, T, SPW**

1. Determination of the health problems of a community
2. Prioritization criterion
   - Problems;
   - Behaviors;
   - Of forces.
3. Community balance
4. Development of a plan of action in community health
5. The techniques of communication
   - The meeting;
   - The discussion of group;
   - The brainstorming session;
   - The conference-debate;
   - The maintenance;
   - The Counselling …
6. The principles of health promotion: Conference in Jakarta
7. The Ottawa conference

- **Health and Development: 3 credits (45 hours); L, T, P, SPW**

1. Public health concepts

- Definition of concepts;
- History and evolution;
- Determinants of Health - Health Indicators - risk factors.

2. Policy and the health system

- History and evolution of primary health care in Cameroon;
- The principles of care in public health;
- Strategy for the fight against poverty;
- Sectoral strategy for health;
- Organization of health services in Cameroon;

- Overview on the priority programs (ENP, malaria, AIDS, CGT, etc …);
- The objectives of the Millennium Development Goals (MDGS);
- The elements of social inequality in health (ISS);
- Reorientation of primary health care (central level, intermediate, device, community participation, co-management, cost recovery, essential drugs, minimum package of activities).

- **Community health: 2 credits (30 hours); L, T, SPW**

1. The man, its physical environment
2. Evaluation of the actions of the improvement of the quality of the Environment
3. Environmental factors affecting the health: noise, gas; pollution, waste, air, water
4. Analysis of the health situation of the community
5. Health of the Environment
    - Waste management;
    - Controls of vectors;
    - Water supply;
    - Hygiene of the power supply;
    - Relations environmental factors and rural exodus.

- **Quality assurance**
    - **Principle of assurancequality**
    - Introduction to quality assurance;
    - Quality control in practice;
    - Guide good execution of the Analyzes of Medical Biology (G.B.E.A);
    - ISO (International Organization for Standardization).
    - **Establishment of a policy of quality assurance in the laboratory**
    - Definition of the objective qualities;
    - Choice of Indicators qualifications and the development of the plan of action;
    - Instrument panel;
    - Management of the laboratory: planning the analyzes, material management, stocks, the Workspace, metrology, maintenance of equipment;
    - Quality audit, archiving, and traceability.

MLS232: Initiation to research and biostatistics

- **Research Project**

Objective: At the completion of this course, students should be able to:

- Understand the concepts of research in the biomedical sciences and be able to apply them
- Be able to accurately describe the fundamental concepts and approaches in qualitative and quantitative research methodology.
- Be able to find and appraise the available research literature through the use of valid resources, and thereby provide informed opinion.
- Be able to raise research questions in professional practice and apply appropriate research methodology to investigate and solve the research questions.
- Write a research proposal for approval by the Ethics Committee.
- Understand the role of bias and confounding and how to control for these in selection of study design.
- Appreciate the role of chance/random error, and the appropriate choice and application of statistical testing to assess this.
- Demonstrate the skills and knowledge required for independent or group research.

Content:

Introduction to research: Meaning and objectives of research; definition and Significance of health research, importance of research methodology for health science students.

Scientific research: Definition; C**haracteristic of scientific research:** Purposiveness, Rigor, testability, reliability, validity, replicability, precision, generalizability, objectivity); **Dimensions of scientific research** (concepts, theories, deductive & inductive reasoning, empiricism, variables, hypothesis, propositions **Elements of the Scientific Method**: Empirical Approach, Observation, Question, Hypotheses, Experiments, Analysis, Conclusion, and Replication

Scientific research process:

Categories of Research: Empirical and theoretical research, Basic and applied, Descriptive vs Analytical Research, Quantitative vs Qualitative Research, Conceptual vs Empirical Research, Etc.

- **Biostatistics I**

Objective: To summarize, analyze, present and interpret health statistical information.

Content:

1. Introduction
2. Basic concepts in biostatistics
3. Sampling techniques and data collection
4. Variables (Qualitative and Quantitative)
5. Presentation of data: Frequency and frequency distribution, bar charts, Histograms, pie charts etc.
6. Summarization of qualitative and quantitative data: mean, median, standard deviations and standard errors.

- **Biostatistics II**

Content

1. The concept and Principles of Significant tests and confidence intervals
2. Statistical testing and inference: The normal distribution and t-distribution, Chi squared test, Poison distribution, non-parametric tests etc.
3. Errors in statistics

Construction of a Research proposal: **Background:** Literature review, formulating the problem statements, justification of studies, objectives, framing the questions according to general and specific objectives; is developing a testable hypothesis to achieve the objectives for quantitative research selection, referencing, etc.; Ethical considerations; Work plan: personnel; timetable project administration; Plans for dissemination.

Data collection and management: Design and Pretesting of measuring instruments (reliability and validity of instruments);training of interviewers; quality control of measurements; computerization, checking and validating, measurements; the issue of missing observations, statistical summarization of information; testing of hypothesis.

Analysis & presentation of Results; Report writing and format.

MLS233: Clinical Haematology 1- Medical Entomology - Blood Transfusion

- **Clinical haematology 1: 3 credits (45 hours); L, T, P, SPW**

1. Hematopoiesis

- Presentation and description of the myeloid lineage and the lymphoid lineage;
- Physiology and pathology of the Hematopoiesis.

2. Haematological techniques

- Venous sampling;
- Enumeration formed elements of blood: red blood cells, white blood cells and blister card;
- Dosage of hemoglobin and hematocrit;
- Blood smears: mounting, panoptical staining of May GrunwaldGiemsa and establishment of the leukocytic formula.
- Practical work (15 Hours)

- **Medical Entomology: 1 credit (15 hours); L, T, P, SPW**

- Medical Entomology and major diseases transimmted by insects;
- Classification, medical importance, geographic distribution, morphology and diagnosis, Biology, cycle of transmission of the main pathogens and struggle of:
  - **Arthropods** : introduction, definition and distinction between immes and insects ;

- **The main** dust immes :Ixodés (Argas) and Trobodidés (Sarcoptes and Demodex);
- **The Insects:**tabanids (horse flies), sarcophagid flies(agents of myases), Psychodides (phlebotomussp), Simulidés (black fly), Culcidés (mosquitoes) and Muscidae (biting flies and flies cock-blowers);
- **Other insects:** Anoploures (lice), Hemiptera (bugs) and Aphaniptères (chip).

• Malacologie: classification, medical importance, geographic distribution, morphology and diagnosis, Biology, cycle of transmission of the main pathogens and fight of the main shellfish.

- **Blood Transfusion: 1 credit (15 hours); L, T, P, SPW**

1. The blood, hemostasis: the blood groups, the Cellular products and products derived from blood
2. The modes of collection of blood, conservation of blood products
3. Transfusion technique: Check transfusion pre, install products, blood transfusion safety, legislation relating to transfusion
4. The responsibility of the Technician vis-a-vis the blood transfusion.

MLS234: Clinical Biochemistry 1 – Laboratory

- **Clinical Biochemistry 1 - Laboratory: 4 appropriations (60 hours); L, T, P, SPW**

1. Physiological study of different biochemical parameters of medical interest: techniques of biochemical assay and interpretation, normal values of biochemical constituents in biological fluids and pathological variations (2nd part)
2. Exploration of the metabolism of carbohydrates, lipids, proteins, enzymes, mineral ions and acid-base balance
3. **Practical work** (20 Hours)

MLS235: Clinical Bacteriology 1 – Laboratory

- **Clinical Bacteriology 1 - Laboratory: 3 credits (45 hours); L, T, P, SPW**

1. Presentation of the bacterial systematic
2. The study of bacteria of medical interest: the Coccigram positive, the negative Coccigram and bacilli Gram positive (history, habitat and epidemiology, fill pathogen, Bacteriological characters, diagnosis, treatment and prophylaxis)
3. Bacteriological techniques: microscopic examinations, isolation and identification of the products of Clinical Bacteriology (technical and transport), methods of sterilization and preparation of media of cultures
4. Techniques of conventional identifications and generality on the Enterobacteriaceae (1st part)
5. **Work Practices** (10 Hours)

MLS236:Internshipof Community Health /Hematology

- **Internship community health 1 : 6 credits (90 hours) ; P, SPW**

MLS237: Information and Communication Techniques

- **Techniques of Information and Communication 1**

1. Concepts and architecture of computers
2. Definitions: computing, information, computer, data, program, software, drivers
3. System of enumeration of base 2, the unit of measure of the information and its multiple
4. Components of the computer (hardware and software)
5. Study of an operating system
6. Study of a text treatment software: Microsoft Word
7. Study of a spreadsheet/Microsoft Excel
8. Study of a presentation software: Microsoft PowerPoint

- **Technique of information and communication 2**

1. Creation of a simple database with a spreadsheet (How to Give a name to a cell range)
2. Validation of Data in a range of cells on a spreadsheet
3. Creation of the statistical tables simple (modality, workforce, frequency) and automatic filling with functions such as NB, NB.If and NB.If.ENS, Average, Sum, if
4. Creation of graphics from statistical tables
5. Presentation and use of a statistical software (ex: Epi Info)
6. Creation of a questionnaire on EPI info or other
7. Data entry and analysis
8. Definition of the concepts of the computer network
9. Presentation of the types of media and networks
10. Presentation of Internet (Connection, research, download)
11. Networks withoutwires
12. Learning of a software application
13. Numbering system
14. Computer Security: Virus and antivirus

MLS241: Clinical Parasitology 1 - Medical Mycology - Immunology/serology

- **Clinical parasitology 1: 2 credits (30 hours); L, T, P, SPW**

1. **The intestinal protozoa**
   - **Generality/classification;**

- **Rhizopods:** Entamoebahistolytica and other amoebae;
- **The flagellates:** Trcichomonasintestinalis, Giadaintestinalis, Chilomastixmesnii;
- **Ciliates:** Balandidium coli;
- **Sporozoaires:** generality, Isosporabeli, Cryptosporiumparvum, micro sporidia.

2. The Tissue protozoa

- **Sporozoaire:** plasmodia, Toxoplasmagondii;
- **Tissue flagellates:** Trypanosomasp and Leishmaniasp;
- Techniques for completion of the reviews of bases in Parasitology;
- The helminthiasis infections (1st part).

3. Practical work (04 Hours)

- **Medical Mycology: 2 credits (30 hours); L, T, P, SPW**

1. Introduction on the mycology: definition and development of the Mycology
2. Generality on the fungi : structure, nutrition and growth, reproduction, pathogenicity, mode of contamination, the role of fungi in the states of IMMunosuppression
3. The sampling techniques
4. Diagnosis of yeasts of medical interest: direct examination, culture and identification
5. Diagnosis of dermatophytes: direct examination, culture and identification
6. Theoretical study of deep fungal infections
7. Antifungal agents: Classification and mechanisms of action
8. Antifongigramm
9. **Practical work (04 Hours)**

- **Immunology / Serology: 2 credits (30 hours); L, T, P, SPW**

1. Introduction to the immunology: organs and cells of the immunity
2. Description of the elements of the immune system
3. Description of the mechanisms of the immune response
4. Regulation of the immune response
5. Introduction to the techniques of diagnosis immunological: agglutination reaction, etc.
6. Cell-mediatedimmune response: function of T cells, cells with the Antigen,cell mediated cytotoxicity, central role of macrophages, the lymphokines and cytokines produced by macrophages
7. The complement system: the different components, their role in the activation reaction (track alternates and Track Classic); become the activation
8. The major histocompatibility complex (MHC): origin and evolution of the MHC; the MHC genes in their chromosomal context; biochemistry of the

molecules of Class I and Class II of the MHC; a function of molecules invariant associated to the molecules HCMA class II in the presentation of the Antigen

9. Techniques of typing of MHC; the MHC, and organ transplantation
10. Immunological techniques
11. Work Practices (10 Hours)

MLS242: The Economics of Health - The priority program of health in Cameroon

- **The economics of health: 1 credit (15 hours); L, T, SPW**

1. **Basic concepts in health economics:** supply, demand, the financing of the Health;
2. **Concept of the market in health:** the supply of health care; request of care; financing of care;
3. **The funding in health:** social protection, pooling of the financing of the Health;
4. **Health Financing in Cameroon** : Community funding (CNPS, mutual health and system put in place by the state for public servants); non-Community funding (budget of the ministries concerned, public health and other…); bilateral and multilateral cooperation (NGOS, other donors, …);
5. **The health planning;**
6. **Health system and their assessment:** effectiveness, efficiency, cost, effectiveness/efficiency, cost / efficiency.

- **The priority Program of Health in Cameroon: 2 credits (30 hours); L, T,SPW**

1. Program for the fight against malaria;
2. Program to combat tuberculosis;
3. The Onchocerciasis Control Program;
4. Vaccination and ENP;
5. etc.....

MLS243: Bacteriology clinic 2 - Clinical Biochemistry 2 – Laboratory

- **Clinical Bacteriology 2: 2 credits (30 hours); L, T, PW**

1. Study of Enterobacteriaceae (suite and end)
2. Techniques of realization of bacteriological examinations with sensitivity
3. **Work Practices (10 Hours)**

- **Clinical Biochemistry 2: 2 credits (30 hours); L, T, PW**

1. Exploration of the kidney functions, cardio-vascular, hepatic, pancreatic, exploration of diabetes

2. Biochemistry of the urine
3. Quantitative analysis of proteins of the urine
4. Quantitative analysis of the uric acid
5. **Practical work (10 Hours)**

MLS244: Hematology Clinic2 – Laboratory

- **Hematology clinic 2 - Laboratory: 2 credits (30 hours); L, T, SPW**
  1. **Hemostasis and coagulation**
     - Definition, purpose, physiology and pathology of the primary hemostasis, of the secondary hemostasis and fibrinolysis;
     - Schema of the coagulation;
     - The pathology of the primary hemostasis and the secondary hemostasis;
     - Techniques for exploring the primary hemostasis, of the secondary hemostasis and fibrinolysis.
  2. **Staining vital fresh blood**
     - Brilliant cresyl blue (alcoholic reticulocytes and body of Heinz); - toluidine blue (granulations basophilic).
  3. **Global Test of hemostasis**
     - Bleeding time, time of coagulation, measure the resistance capillary and prothrombin time;
     - Time to Howells;
     - Test to the heparin;
     - Separate metering of the elements of the complex prothrombique; - speed of sedimentation of the RBCS; - globular Resistance osmotic.
  4. **Practical work (10 Hours)**

MLS245: Clinical Internship 3 (Parasitology/Immunology)

- **Clinical Internship 3: 6 credits (90 hours); P, SPW**

MLS246: Clinical Internship 4 (Serology/Anapath/Histology)

- **Clinical Internship 4: 4 appropriations (90 hours); P, SPW**

MLS247:French and English for Medical profession

Objective: To develop communication skills in French and English language and thus enhance patient relationship as needed.

Content:

1. Grammar
2. Different parts of the human body
3. Conversation in French and English as specific to health care

4. Translation of Medical Terms, prescriptions, technical and protocol forms, drug dispensation notices
5. Drafting of reports
6. Documentation research
7. Use of data sheets and protocols in the French language.
8. Health structures, premises, equipment, professional categories
9. Drafting of researchtopics
10. Dissertation on the professional articles
11. Interviews - Speech unto etc. ….
12. Health structures, premises, equipment, professional categories
13. Hospitals
14. The Hardware
15. The staff
16. The Role
17. The pathologies
18. The drugs

- **The pathologies by systems**

- Urinary system;
- Cardiovascular System;
- Digestive system;
- The endocrine syste

MLS351: IEC3 - Health Information System - Health Management

- **IEC 3: 2 credits (30 hours); L, T, SPW**

1. The educational program in health
   - Definition;
   - The components;
   - Development.
2. Monitoring and motoring an educational program
   - Definition;
   - Principle.
3. The supervision of an educational program in health
   - Definition;
   - Supervision and motoring;
   - Why the supervision?
   - The steps of the supervision.
   - The styles of supervision:
     - Autocratic supervision;
     - Anarchic supervision;
     - Democratic supervision.
   - The benefits of the supervision.

4. The evaluation of a health program
   - Definition ;
   - Type of Assessment.
   - The components (criteria) of the evaluation process:
     - The objectives;
     - The impact indicators;
     - The indicators of health coverage;
     - Indicators of community participation.
       - ✓ Why evaluate?
       - ✓ How to evaluate?
       - ✓ Predictive Value and Program of struggle of a disease.

- **Health Information System: 2 credits (30 hours); L, T, SPW**

1. Definition;
2. Goals;
3. Statistical elements:
   - Unit unto Population, Sample;
   - Sources of statistical data;
   - The statistical calculation.
4. The process of health information: - collection of data;
   - Media, routing;
   - Treatment (counting, grouping, presentation);
   - Analysis and interpretation;
   - Retro-information and decision-making.

- **Health management: 2 credits (30 hours); L, T, SPW**

1. Concepts
2. The Management Process
3. Health Organization in Cameroon
   - Mission of Health training on the national territory: health center, district hospitals, hospitals, central and regional, general hospitals, CHU, private hospitals and clinics laity and confessional, liberal medicine;
   - Hospital reform, inter Ŕrelation with national organizations that contribute to the health and the fight against poverty (other government departments, donors, international organizations, NGOS, associations).
4. Organization of health training, public and private
   - Legislation which applies to health training;
   - Economic and Financial Management;
   - Workforce management Workforce management, staff and the continuous training;
   - Management of care and drugs.
5. Mutual health.

MLS352: Drafting of end of course research

- **Drafting of end of course research: 3 credits (45 hours); L, SPW**

It depends on the theme of work of the learner; it must be drafted in accordance with the following plan:

1. Summary
2. Introduction: 2 pages maximum. The introduction, it is spring loaded to the problematic
   - It raises the question of research;
   - It sets the assumptions;
   - It sets the general objective;
   - It sets out the specific objectives and sets out the plan.
3. Chapter I, II: The literature review (Review of the literature)
4. Chapter II, III: The methodology
5. Chapter III, IV: Presentation of the results and discussion
   - Conclusion and recommendations;
   - Bibliography.

MLS353: Clinical Parasitology 2 - Clinical Haematology 3 – Laboratory

- **Clinical parasitology 2: 4 appropriations (60 hours); L, T, P, SPW**

1. Nematodes Intestinal disorders:
   - Ascaris Lumbricoïdes,
   - Trichuratricguira,
   - EntorobiusVemicularis, Ankylostomaduodenale, Teniasp
2. Sanguicoles nematodes
3. Skin nematodes
4. Techniques for the identification of a parasitic
5. Techniques of concentration
6. **Practical work (30 Hours)**

- **Clinical haematology 3: 3 credits (45 hours); L, T, P, SPW**

1. Study of the pathological blood

- Anemia;
- The leukopenia;
- The leucocytoses;
- The polyglobulies;
- Hematological malignancies : general study of the malignant cytology, classification, leucoses, malignant lymphomas and other diseases of the system; - the myeloid leukemia;
- The lymphoid leukaemia.

2. Practical work (15 Hours)

MLS354: Clinical Bacteriology 3 - Laboratory – Virology

- **Clinical Bacteriology 3: 2 credits (30 hours); L, T, P, SPW**

    1. Revision of the Systematic Bacteriology;
    2. **Practical work (15 Hours)**

- **Virology: 1 credit (15 hours); L, T, P, SPW**

    3. Generality on the virus;
    4. Classification and structures of the virus;
    5. Presentation of some of the viral diseases;
    6. Techniques for the identification of the virus.

MLS355: Analytical Chemistry – Laboratory

- **Analytical Chemistry - laboratory: 2 credits (30 hours); L, T, P, SPW**

- Generality: Definition, role, classification of methods of analyzes, steps of the quantitative analysis, errors in the chemical analyzes (systematic error, random error);
- Preparation of the sample for analysis: Sampling, sources of errors during the decomposition/dissolution of samples, elimination of interference when a reaction;
- Analytical technique: titrimétriques method (principle, technical and application); Techniques of titration acid/base (acidimétrie and alcalimétrie); Techniques of titration by precipitation (argentimétrie and thiocyanométrie) Techniques of titration complexométrique (chélatométrie); Method of titration by (redox Manganimétrie, iodometric and chromatométrie); gravimetric analysis (principle, technical and application).

MLS356: Internship in Community Health 2

- **Internship community health 2: 6 credits (90 hours); P, SPW**

MLS357:Ethics and Civic education and Initiation to research

- **Ethics and Civic education: 2 credits (30 hours); L, T**

The Concepts

- The citizen;
- The Nation;
- The State;
- Publics Property and collective's goods;
- The freedoms;
- The public service;
- Ethics;

- Ethics, Law and reason;
- Ethical Problem ;
- Ethics and management.

- Civics
- Deontology
- Moral consciousness
- The universal declaration of Human Rights
- Good governance in public services
- The importance of civics to the life of the nation
- Functions of the state and its citizens
- Deontology, Professional ethics and professionalism
- Relationship between morality, law and ethics
- Codes of ethics

- **Labor law: 1 credit (15 hours); L, T, SPW**

1. Definition of the right of labor, birth and evolution of labor law and sources
2. The contract of work (conclusion, implementation and rupture)
3. The conflicts of work (individual and collective)
4. The delegate of the staff, unions
5. Work accidents and occupational diseases
6. The hygiene and safety in the workplace

- **Administrative Law: 1 credit (15 hours); L, T, SPW**

Nature and function of the management of personnel, training and staff development, supervision and evaluation of employees; assessment of jobs and administration of salaries; trade union organizations and labor legislation, collective bargaining, grievance and strikes; administration services to employees. Practical application in industrial administration, public and the hospital.

- **Civil law: 1 credit (15 hours); L, T, SPW**

Society, ethics and the law; the foundation of the right and of the social life; concepts of health and education; place of the body in moral and in law; the right and duties of the individual and of the Community (right of patients, the rights of the person and the health care system); privatization and publicisation of health, respect for private life and social cost of health. Autonomy, participation, etc.

MLS361: Microbiology of the environment - Food Microbiology

- **Microbiology of the environment: 3 credits (45 hours); L, T, P, SPW**

1. Introduction and concept
2. The main microorganisms: description and habitat, power pathogens, epidemiology, higHCMighted and means of fight

3. Role of microorganisms in the cycle of nutrient inputs: Characteristics of microbial ecosystems
4. Soil microbiology, aquatic environments, the air
5. The methods of analysis: microbial techniques, immunological techniques, molecular techniques

- **Microbiology of food: 2 credits (30 hours); L, T, P, SPW**

1. Generality on the Microbiology of food
2. Microbiological Analysis of Foods
3. Principle, purpose and interpretation, multiplication factors of microorganisms, infections of food origins
4. Techniques of Microbiological Analysis of Foods: cooked dishes, meat and meat products, the product of the sea, milk and milk products, beverages other than water
5. Techniques for the microbiological analysis of natural waters and intended for human consumption: general methods of sampling and analyzes, microorganisms indicators of pollution, pathogenic microorganisms

MLS362: Histopathology – Human Cytology

- **Histopathology: 2 credits (30 hours); L, T, P, SPW**

1. Generality and general principles in anatomy and pathological cytology
2. Anatomy and Histology Normal: Female Genital Organs / endocrine organs
3. Cytology breast pathology and of the genital tract of women
4. Normal smears / pathological smears and classification of Bethesda
5. Cervical cancers

- **Human cytology: 2 credits (30 hours); L, T, P, SPW**

1. Cytology and cytopathologies of serosa (LCR, joint fluid and skin)
2. Tree broncho-pulmonary: Anatomy and normal histology, cytopathology inflammatory, of dystrophic tumor and
3. Urinary system: anatomy, histology, cytology of the urine, inflammatory tumor and
4. Typhoid, liver and the ganglion: anatomy and histology, cytology inflammatory tumor and
5. Precancerous lesion
6. Study of the sperm analysis
7. Standard techniques / special techniques (IMMunohistochemistry, etc.)

MLS363: Clinical Biochemistry 3 - Clinical Parasitology 3 – Laboratory

- **Clinical Biochemistry 3: 2 credits (30 hours); L, T, P, SPW**

  1. Biochemical reviews concerning the hormones, vitamins and oligo-elements.
  2. **Practical work (15 hours)**

- **Clinical parasitology 3: 2 credits (30 hours); L, T, P, SPW**

  - The techniques of concentration
  - **Practical work (15 Hours)**

MLS364: Molecular Biology

- **Molecular Biology: 2 credits (30 hours); L, T, P, SPW**

  1. Structure, ownership and molecular characteristics of nucleic acids (DNA and RNA)
  2. Biosynthesis of nucleic acids
  3. Biosynthesis of proteins
  4. Introduction to the Genetics
  5. Classical Genetics
  6. Gene and transmission of genetic information
  7. Use of Genetic Information
  8. Mechanism of replication, mutation.

MLS365: clinical internship 5 (Biochemistry)

- **Clinical Internship 5: 6 credits (90 hours); P, SPW**

MLS366: clinical internship 6 (Mycobacteriology)

- **Clinical Internship 6: 6 credits (90 hours); P, SPW**

MLS367: Professional Ethics &Deontology

Objective: At the end of the course, the student should be able to know those values and obligations which practice in the profession.

Content: Nurse, Patient, nurse/patient relationship, obligations of the nurse, rights of the patient, rights and responsibilities of the nurse, deontology, ethics, etiquettes, patient reception in hospital, nurse/patient-relative relationship. Medical jurisprudence, lab practice and the law, forensic nursing, malpractice, civic duties, organization of Government, Common law, labour law, Criminal Law,etc.

Health care Ethics

1. Morality and Ethics: Norms, Deviances, Religion, Values, Beliefs, Cultures
2. Bioethics

3. MLS Ethics
4. Moral Development
5. Ethical Principles: Autonomy, Freedom, Privacy, Confidentiality, Beneficence, Fidelity, Motivation, Justice, Veracity and Responsibility.
6. Code of Ethics health workers.
7. Application of Ethics to MLS Practice: Respect For Life And Death, The Concept Of Dignity, Euthanasia, Human Rights, Rights of The Child, Rights of The Elderly, Patients Rights
8. Ethical Decision Making Frameworks and their Application in diagnosis
9. Context And Conflicts With Bioethical Standards

Patient Rights:

1. Respect for life and death, the concept of dignity, euthanasia
2. Care for dying patients: Palliative care, Confidentiality, Professional secrecy, Medical Research and Nursing care ethics.
3. Code of ethics.
4. Health Employee/employer contract law for health practitioners
5. MLS and the law

Introduction to Law and Fundamental Rights

Law

- Sources of law
- Law and enabling Acts (text of application)
- The concept of legal personality
- Civil responsibility (contract, TORT)
- Criminal responsibility
- The court and their jurisdictions
- Labor law: formation and execution of labor contract, remuneration, condition of work, obligation of the employer and employee, termination of labor contracts

Fundamental Rights

- The concepts of human rights
- Sources of human right
- Major international conventions of human rights
- International conventions relating to women
- Children and the rights of the minorities
- The role of the judiciary and the legislative in the protection of human rights
- The Cameroon national commission of human rights and liberties
- The civil society NGO's and the protection of human rights

Law for Medical laboratory personnel

- Definition of Law, public law, private law
- The client's and MLS personnel's' constitutional right

Administrative law related to licensing and regulation of health practice

Field : MEDICAL AND BIOMEDICAL SCIENCES

Specialty :

MEDICAL IMAGING TECHNOLOGY

Field:	MEDICAL AND BIOMEDICAL SCIENCES

Specialty:	Medical Imaging Technology

1. Objective of the training

Given the current complexity of radiodiagnostic and radiotherapy techniques (computer science, quality assurance, etc.), on the one hand, and the requirements in terms of radiation protection and health safety (determination of effective doses in radiology, for example), on the other hand, It is necessary to set up a university level training to meet the current needs of hospitals in qualified professionals. It is wise to take into account, the phenomenon of staff turnover due to retirements and, to give technical managers the possibility of continuing their studies in a rapidly expanding field. This is the objective of the HND specialty Radiology and medical imaging.

2. Research Skills

→ **Generic skills**

- Be responsible and reflective;
- Have gestural skills and interpersonal skills;
- Recognize your emotions and use them with the necessary professional skills;
- Have proven trust and confidence;
- Have critical ability and questioning;
- Develop a professional ethic and normal;
- make thoughtful decisions;
- Act with autonomy and responsibility in the well-defined fields of its function;
- Track the inventory status of consumables, set up replenishment orders and arrange equipment storage;
- Check the operation of the devices, update the maintenance register and inform in case of malfunction;
- Master the computer tool and ICT.

→ **Specific skills**

- Research and process scientific professional data;
- Perform medical imaging (conventional radiology, MRI, CT scan, ultrasonography) diagnosis or pathology screening according to the medical prescription;
- Be able to perform dosimetric calculations;
- Calculate the doses of radioactive products of a preparation according to the treatment of a patient;
- Control the application of Quality-Safety and Environment procedures;

- Perform magnetic resonance imaging (MRI) examinations using radiographic techniques;
- Check the conformity of a sensitive equipment or installation;
- Perform CT examinations according to X-ray techniques;
- Perform mammography examinations using radiographic techniques;
- Be able to use ionizing radiation to destroy tumors or to intervene in nuclear medicine.

3. Opportunities

- Public function;
- Hospitals and private clinics;
- NGOs (Non Governmental Organizations);
- Self-employment;
- Agribusiness ;
- Occupational Medicine ;
- Research and training.

4. Organization of the Teachings

Semester 1

Field : Medical and Biomedical Sciences		**Specialty: Medical Imaging Technology**					
Code	**Courses titles**	**Hourly Volume**					**Number of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
MIT111	Chemistry - Physics Biology - Biochemistry - Microbiology	40	15	15	5	75	5
MIT112	Electronics – ECG - EEG	30	15	10	5	60	4
Professional Courses 60% (4 UC) 18 credits 270 hours							
MIT113	Mathematics - Statistics	35	20	0	5	60	4
MIT114	Radiology Anatomy	30	15	10	5	60	4
MIT115	Physics of Ultrasound, Physics of Magnetic Resonance, Physics of Radiation and Nuclear Physics, General Anatomyand Physiology	40	15	15	5	75	5
MIT116	Clinical internship (immersion)		-	60	15	75	5
Transversals Courses 10% (1 UC) 3 credits 45 hours							
MIT117	Methods of work -Bilingual training Information and Communication Technologies I (ICT)	25	10	5	5	45	3
Total		**200**	**90**	**115**	**45**	**450**	**30**

Semester 2

Field : Medical and Biomedical Sciences		Specialty: Medical Imaging Technology					
Code	Courses titles	Hourly Volume					Number of credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
MIT121	Psychology and Relationship of Assistance - General hygiene	30	15	10	5	60	4
MIT122	Care techniques-Nursing-First aid I-Epidemiology	40	20	10	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
MIT123	Radiation protection and Biological effects of radiation	30	15	10	5	60	4
MIT124	Ergonomics, General description of devices and technology	30	20	20	5	75	5
MIT125	Practical work in Chemistry, Microbiology, Physics and Electricity	40	15	15	5	75	5
MIT126	Dosimetry and ultrasound Internship	/	/	45	15	60	4
Transversals Courses 10% (1 UC) 3 credits 45 hours							
MIT127	French -Medical English	25	10	5	5	45	3
Total		**195**	**95**	**115**	**45**	**450**	**30**

Semester 3

Field : Medical and Biomedical Sciences		Specialty: Medical Imaging Technology					
Code	Courses titles	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
MIT231	Pharmacology of radiology, contrast medium, Nuclear medicine and Radiochemistry	40	20	10	5	75	5
MIT232	Radiation protection and biological effects of ionizing radiation, Computer Science applied to the imaging I	30	15	10	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
MIT233	Positioning and imaging techniques (IM2TECDOGY, IM2 TUrThEx, IM2TAUHGCC)	30	20	35	5	90	6
MIT234	Recording techniques, processing and printing of images I (IM2TRTLM1)	20	20	30	5	75	5
MIT235	Hospital management	20	10	10	5	45	3
MIT236	MRI Internship and MRI ability	/	/	45	15	60	4
Transversals Courses10% (1 UC) 3 credits 45 hours							
MIT237	ICT II and Civic Education and Ethics	25	10	5	5	45	3
Total		**165**	**95**	**145**	**45**	**450**	**30**

Semester 4

Field : Field : Medical and Biomedical Sciences		Specialty: Medical Imaging Technology					
Code	Courses titles	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
MIT241	General pathologies - Hematology	40	15	15	5	75	5
MIT242	Care techniques – Nursing- First aid II	30	10	15	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
MIT243	Community Health, Computer Science applied to Imaging II	30	15	10	5	60	4
MIT244	Quality control in conventional radiology(ISO 9001), Environmental management system (ISO 1401) and the patient protection	30	15	10	5	60	4
MIT245	Health Education and Life Cycle	30	20	5	5	60	4
MIT246	Nuclear medicine and Scanner Internship and aptitude	/	/	60	30	90	6
Transversals Courses10% (1 UC) 3 credits 45 hours							
MIT247	Initiation to research + Health Economics	20	10	10	5	45	3
Total		**180**	**85**	**125**	**60**	**450**	**30**

Semester 5

Field : Field : Medical and Biomedical Sciences		Specialty: Medical Imaging Technology					
CODE	Courses titles	Hourly Volume					Number Of Credits
		L	T	P	PW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
MIT351	Family Planning, Maternal and Child Health	30	15	10	5	60	4
MIT352	Image positioning Techniques : Radio-conventional, Dosimetry, MRI - Pediatrics	40	15	15	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
MIT353	Special pathologies Pediatrics - ENT	45	20	20	5	90	6
MIT354	Special Gynecological and Neurological Pathologies	30	15	10	5	60	4
MIT355	Computer Science applied to the Imaging III	30	15	10	5	60	4
MIT356	Conventional Imaging Internship	/	/	45	15	60	4
Transversals Courses 10% (1 UC) 3 credits 45 hours							
MIT357	Medical Law and Legal Environment	20	10	10	5	45	3
Total		**195**	**90**	**120**	**45**	**450**	**30**

Semester 6

Field : Field : Medical and Biomedical Sciences		Specialty: Medical Imaging Technology					
CODE	**Courses titles**	**Hourly Volume**					**Number Of Credits**
		L	**T**	**P**	**PW**	**Total**	
Fundamental courses 30% (2UC) 9 credits 135 hours							
MIT361	Angiography, Interventional Radio and Endoscopy	40	15	15	5	75	5
MIT362	Specific Law and Organization of work	30	15	10	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
MIT363	Pediatric Imaging, Dosimetry	20	10	10	5	45	3
MIT364	Internship special examinations and Operating Room	/	/	55	20	75	5
MIT365	Emergency Imaging internship	/	/	55	20	75	5
MIT366	Professional internship	/	/	55	20	75	5
TransversalsCourses 10% (1 UC) 3 credits 45 hours							
MIT367	Professional Ethics &Deontology	20	15	5	5	45	3
Total		**110**	**55**	**205**	**80**	**450**	**30**

5. Courses content

MIT111: Chemistry – Physics Biology- Biochemistry – Microbiology

- **General Chemistry: 2 credits (30 hours); L, T, P, SPW**

1. Atoms and Molecules

- Items unto the compounds- Mixtures unto Atomic Theory of Dalton unto the molecules unto atomic mass and molecular mass unto Constitution of the Atom unto the isotopes unto the mass spectrometer unto periodicity and classification of elements unto metals and non-metals unto load of the ions.

2. The electronic structure of the Atom

- Energy of ionization unto spectrum of rays of the Atoms - Atomic Theory of Bohr unto atomic theory undulatory - quantum numbers unto rules of Pauli and Hund unto electronic configuration of atoms unto atomic rays and periodicity.

3. Chemical reactivity

- Chemical equations by group unto redox reactions unto Numbers of oxidation and the weighting of the redox reactions unto combination reactions unto the decomposition reactions unto a substitution reaction unto reaction of double-displacement.

4. Quantitative aspects

- Mole and Avogadro's number unto stoichiometric coefficients in the chemical equations unto stoichiometric balance unto limiting Reagents unto performance of a reaction solutions unto molarity unto reaction in solution and in the gas phase - precipitation reaction unto the rules of solubility Réactions acid-base reaction unto of redox unto assays unto preparations of solutions.

5. Chemical connections

- Ionic bindings: Definition, electronic configuration of ions, ionic crystal and reticular energy covalent bonds: Models of Lewis, rule of the byte, formal charges, hybrids of resonance, and exceptions to the rule of the byte, Electronegativity, Polar Connections and dipole moments unto bond energy.

6. Geometry of the molecules

- Prediction of the geometry of the molecules unto RPECV theory: "repulsion of electronic pairs of the layer of Valencia" - Description of the 5 geometries.

7. Introduction to spectroscopic methods,

- Transmission and Absorption unto Law of Lambert-Beer unto notion of spectrum unto diagram of a spectrophotometer unto Molecular Spectroscopy UV unto visible.

8. Etas of light

- Solid, liquid and gas unto the intermolecular forces unto metal connections.

9. Chemical equilibrium

- Dynamic balancing unto equilibrium constant unto balance sheets of contents of equilibrated reactions unto reaction Quotient unto principle of the Chatelier unto influence of temperature.

10. Speed of the reactions

- Speeds of the reactions at initial speeds unto the reactions of order a unto the reactions of order two unto reaction mechanisms unto decisive step of speed unto energy of activation unto equation of the Arrhenius unto catalysis.

11. Acids and Bases

- Definitions unto ion product of water unto strong acids and low unto acidity constant Ka and strength of an acid unto strong bases and low Constant unto of basicity unto acid pairs-base combined unto Calculation of pH of solutions of acids, bases unto buffers mixtures and the equation of Henderson unto Hasselbach unto pH indicators unto titration of the acid and base unto titration curve Equivalence and half equivalence.

12. Solubility and reaction of precipitation

- Products of solubility unto the common ion effect unto complexation reactions and influence on the solubility unto reaction Quotient unto selective precipitation unto sulphide separation unto separation of hydroxides unto amphoteric hydroxides.

13. Introduction to spectroscopic methods

- Principle of the separation unto chromatography of absorption, of sharing, of steric exclusion and ionic unto thin-layer chromatography unto High Performance Liquid Chromatography unto gas chromatography.

14. Contrast products used in medical imaging

- Contrast Agents in radiology unto contrast agents in MRI unto radiopharceutiques compound used in nuclear medicine.

➢ **Organic Chemistry: 1 credit (15 hours); L, T, P, SPW**

1. Introduction

- Tour of the horizon unto write of structure unto structural isomers unto structural isomers unto Nomenclature unto the main functional groups.

2. Isometry

- Conformers and conformation of alkanes unto alkenes and isomeric cis or trans unto Enantiomères unto chiral molecules and achirales unto diastereomers.

3. Elements of reactivity of the main organic functions

- Low reactivity of alkanes unto Alkenes and Alkynes: Reactions of addition unto Arènes substitution reactions unto classification of organic functions by "groups of oxidation" - alcohols and other functions "+1" - aldehydes and ketones: Reactions of addition unto carboxylic acids and other functions "+3": substitution reactions.

4. Biological Substances

- Carbohydrates unto lipids unto amino acids and proteins unto nucleic acids.

➢ **General physics: 2 credits (30 hours); L, T, P, SPW**

First part: Mechanical

1. IntroductiOn

- Measures unto vector algebras.

2. Static: body at rest

- Solid Body at rest unto fluids at rest: Hydrostatic.

3. Kinematics: movement of a hardware point

- Curvilinear Movement General unto a particular case of the curvilinear movement: rectilinear movements, circular movements, periodic movements unto theorem of Fourier unto relativity of movement.

4. Dynamic: relationship between movement and cause of the Movement

- Law of the conservation of the quantity of movement and its consequences unto Dynamics of material point or of the solid in the translation unto law of conservation of angular momentum and its consequences unto the dynamics of a solid body mobile around a fixed axis.

5. Work and energy

- Pulse unto Work power unto untoEnergie unto different forms of energy unto units for the energy unto Basic Law: conservation of energy unto Energie recoverable and non-recoverable unto expression of the kinetic energy: energy of movement unto expression of the potential energy: energy of position unto force, potential energy, field, potential: for the gravitational force unto expression of the total energy for a particle unto expression of the total energy for a solid in rotation around an axis unto conservation of energy in the fluids (Bernoulli) unto applications of the principle of conservation of energy and the amount of movement.

Second part: Electromagnetics

1. **Electrostatic**

- Electrical interaction unto the charged particles: Law of the conservation of the load unto Coulomb's Law unto Electric Field unto energy electrical potential of a load unto electrical potential unto analogies between the gravitational interaction and the interaction unto electrical conservation of the electrical energy in an electric field - electrical power unto theorem of Gauss for the electric field on the matter unto electrical capacity unto capacitors.

2. **Electrical Circuits in continuous current**

- Ohm unto Pouillet unto origin of the electrical resistance in the conductors unto conductors, insulators and semi-conductors unto Association of resistors in series and in parallel unto Joule effect unto Electromotive Force unto Association of generators unto Kirchhoff unto Thévenin.

3. **Magnetism**

- Magnetic interaction unto representation of the field created by a permanent magnet unto theorem of Gauss for the magnetic field: Characterization of the magnetic field unto action of a magnetic field on a moving charge unto magnetic field creates by a moving charge unto action of a magnetic field on an electrical current unto magnetic dipole unto magnetic field produced by a current: act of an AMP unto Laplace unto electromagnetic field depending on the time unto Law of Faraday-Henry unto Effect of the magnetic field on the matter unto Summary of laws of electromagnetism and Maxwell equations.

4. **Electrical Circuits in alternating currents**

- Auto induction unto the electrical circuits in non-stationary unto the electrical circuits in stationary regime: series circuits and parallel circuits: power in alternative current, resonance, Quality Factor of a resonant circuit.

Third Part: Waves

1. **Definition**

- Elastic waves unto electromagnetic waves unto the wavefront unto intensity of the wave unto principle of superposition unto airwaves transverse and longitudinal.

2. **Spread of the wave**

- General equation of the wave propagation unto spread of harmonic waves;

3. **The properties of the waves**

- Polarization unto Interference diffraction unto unto Dissemination unto waves with interfaces: reflection, refraction, absorption.

Fourth part: geometrical optics

1. **Introduction**

- The light is a radius unto element of visual photometry unto general description for optical devices the Gaussian.

2. **Reflection**

- Laws of reflection unto reflection diffuse unto specular reflection unto reflection on a flat surface unto Description of sPWrical mirrors unto reflection on a sPWrical surface concave unto reflection on a surface sPWrically convex unto aberrations of the sPWrical mirrors.

3. **Refraction**

- Laws of the refraction unto Refraction of a environment less refractile to an environment more refractile unto Refraction of a environment more refractile toward an environment less refractile: critical angle and total reflection refraction unto to a flat interface unto refraction to a sPWrical interface unto refraction to several sPWrical interfaces: Lenses unto aberrations of lenses.

4. **Optical Instruments**

- Eye unto Magnifying Glass unto Microscope

➢ **Biology-Biochemistry: 2 credits (30 hours); L, T, P, SPW**

- Histology: description of the epithelia, connective tissues, cartilage tissue, bone tissue, adipose tissue, muscle tissue, nervous tissue, lymphoid tissues, blood, Cytology;
- Description of a eukaryotic cell animal, cell division, reproduction, biochemistry, classification and description of carbohydrates, lipids, proteins, nucleotides and nucleic acids, elements of enzymology, DNA to protein, glycolysis, catabolism of fatty acids, elements of MITunology, description of the main actors of the MITune system and their roles of defense against infectious agents, bases of the mechanisms.

➢ **Microbiology: 2 credits (30 hours); L, T, P, SPW**

1. The microbial world and microbiology

- Micro-organisms to microbiology;
- The boundaries of the world; microbial
- The evolution of the microbial world;
- The border eukaryotic molecular / prokaryote; - the microbial kingdoms.

2. The micro-eukaryotic organisms

- Common characteristics;
- The algae unto characteristics most shared unto classification;
- Protozoa unto characteristics most shared unto classification;
- The fungi unto characteristics most shared unto vegetative growth unto Reproduction Classification unto unto the yeasts.

3. The micro-prokaryotic organisms:

- Common characteristics;
- General Classification of bacteria;
- The archaea.

4. Viruses

- Common characteristics;
- Constituents;
- Classification criteria;
- Cycle of the viral infection;
- Integration within the cell genome;
- The Temperate bacteriophages;
- The oncogenic viruses;
- Culture and enumeration of virus.

5. Functional Anatomy of bacteria

- General characteristics;
- The Bacterial cytoplasm;
- The cytoplasmic membrane;
- The bacterial cell wall;
- The capsule;
- The bacterial spore;
- The Appendices external;
- The genetic heritage;
- Acquisition of genetic information.

6. Bacterial growth

- Bacterial multiplication;
- The growth of the population;
- Measurement of the growth of a population;
- Physico-chemical parameters affecting the multiplication.

7. Nutritional requirements of bacteria

- Source of energy;
- The nutrients;
- The culture media;
- Conservation of bacteria.

8. Metabolic Pathways of prokaryotes

- Metabolic pathways and energy;
- The APH and the NAD 3;
- The major stages of the metabolism;
- Re oxidation of coenzyme;
- Energy balance of catabolism;
- Photosynthesis.

9. Elements of bacterial systematic

- Organization of the Ranking;
- Difficulties related to the bacterial taxonomy;
- Classification criteria;
- Gram Eubacteria;
- Beyond the eubacteria commons.

10. The interactions micro-organisms /hosts

- Symbiotic associations;
- The interactions micro-organisms / human;
- The parasitism unto strategy of virulence;
- The physiological mechanisms of defense;
- The strategies of circumvention of the defenses of the host.

11. The strategies anti-microbial

- Sterilization, disinfection, antiseptic;
- Resistance to disinfection;
- Physical methods;
- Chemical agents septic anti and disinfectant unto the antibiotics; - vaccine strategies.

12. The operation of the microbial world

- Fermentation and bioconversion;
- Industrial fermentation;
- The bioconversion;
- Micro-organisms and industrial activity.

MIT112: Electronics – ECG-EEG

- **Electronic : 4 appropriations (60 hours); L, T, P, SPW**

First part: General electronics

1. **The signals and forms of waves encountered in electronics**
   - Harmonic signals, periodicals, touch, mundane- Fourier Transform.
2. **The filters**
   - Passive filters of the first and second order;
3. **The oscilloscope**
   - The different parts of the cathode ray tube (CRT) unto Creation modulation and concentration of the harness unto Deviation horizontally and vertically in a TRC unto the Post-Acceleration unto the screen unto the different features of the oscilloscope: figures of Lissajous unto Scan in saw teeth unto multitrace function.
4. **The semi-conductors**
   - Driver insulating unto unto semi-conductor unto pn-junction.

5. **The Diodes**
   - The semiconductor laser diodes ideal and actual unto Rectifiers diodes unto other types of diodes: Zener, Del, photodiode, Varicap.
6. **The transistors**
   - The transistors in the junctions unto the transistors to field effect - the MOS
7. **Integrated circuits**
8. **The operational amplifiers**
   - Connections of the operational amplifier unto the ideal operational amplifier unto the operational amplifier practice unto gain of an operational amplifier unto Rejection of common mode unto spectral response unto the slew rate unto inverting amplifier unto amplifier not inverter unto unto Adder Subtractor Amplifier unto circuit to logarithmic response unto circuit to answer anti-logarithmic unto multiplier Circuits unto splitters Circuits unto integrators circuits.
9. **Digital techniques**
   - The bases of the algebra of Boole unto the logical functions unto fundamental Combinatorial logic unto the binary adders unto addition of two numbers to a bit unto addition of two numbers to two bits unto addition of two numbers to n bits unto multiplexers (MUX); MUX to two tracks, MUX to 4 tracks unto the Circuits demultiplexers unto the binary comparators.

First part: applied to the imaging

1. **The sensors in medical imaging,**
   - The sensors for the imaging by reflection unto the sensors for the imaging by emission –
   - The sensors of ionizing radiation for the imaging by emission and transmission unto common characteristics of the detectors unto the Detectors The more common of the imaging systems
2. **The treatment of the analog signal**
   - Representation, modeling and classification of signals unto Fourier Transform unto Properties its systems of transmission unto function of dispersion unto convolution unto theorem of Plancherel unto transfer function of modulation unto windowing and Filtering Modulation unto unto noise.
3. **Digital Signal Processing**
   - Scan unto Sampling Nyquist unto unto Shannon unto Quantification unto transformed from Fournier discrete and Fast Fourier Transform unto digital filtering.
4. **Two-dimensional signals**
5. **Application**
   - Signal Processing with Matlab.

MIT113: Mathematics – Statistics

- **Mathematics: 3 credits (45 hours); L, T, P, SPW**

1. Introduction

-Elements of algebra and trigonometry, reminders of algebra: inequality unto the absolute values unto the Intervals unto equations and inequalities unto the coordinate system unto analytical representation and graphical representation unto symmetry of the Curves unto circles unto straight. Reminder of trigonometry: General unto trigonometric functions unto identities.

2. Numerical Functions of real variable 1èere part

-General, Definitions, properties of functions: party to increase function or decreasing unto periodic function. Operations on the functions: Sum unto Difference unto product unto the quotient unto composition of functions unto reciprocal functions. The main algebraic functions: ongoing functions unto linear functions unto Functions whole powers and rational unto the functions Polynomials unto rational fractions unto irrational functions.

3. Numerical Functions of real variable - 2e PART

- Transcendent function and their reciprocal.
  - **Trigonometric Functions Basic:** sinus functions, cosinus, tangents and their inverses,
  - **Trigonometric Function reciprocal:** Arcos functions(x), arsin(x), arc Tg(x), o **logarithmic function and exponential:** Definitions unto Loga function(x), ax, ln(x), ex,
  - **Logarithmic calculation -** Equations exponential and logarithmic;

5. Limits and continuity o Limits:

Definitions unto finite limits and infinite unto limit to the left unto limit to the right unto the calculation techniques of limits to forms undetermined.

- continuity: Definitions unto continuity to the left unto continuity to the right unto on an interval discontinuities unto theorem about continuity.
- bypass Definition: derived by a point unto derived to the left unto derived right unto derived function.
- Research of the derived functions: logarithmic derivative unto increase and differential.

6. Applications of the derivative.

- Theorem relating to the functions derivable unto study of the first derivative (direction of variation of a function, maxima and minima, tangents) unto study of the second derivative (points of inflection, concavity) unto asymptotes, comprehensive studies of functions of one real variable unto optimization problems and put in equation unto methods of Newton.

7. Primitivation

- Primitive Function unto methods of primitivation (by decomposition, by the parties, by change of variable) unto specific method (expression irrational, rational fractions of trigonometric expression).

8. Integration

- Definition of the integral unto properties of the ultimate (formula of the average, sharing of the interval of integration) unto Relationship Between primitives and integrals unto calculations of areas (flat surfaces, integrals convergent or divergent). Calculations of volumes (via the circular discs, via the cylindrical tubes)

9. Differential Equations

- Definitions unto differential equations of the first order (of the type y' = Φ(x), to separable variables, homogeneous, linear). Differential equations of the second order (of the type y'' = Φ(x), linear with constant coefficients).

10. Limited development of f(x)

- Formulas of Taylor and Mac Laurin unto Development of f(x) Following the powers of x unto development of NUS (x), cos (x), arc NUS (x), arc cos(x), arc Tg(x), ln (1+x), ex, Applications.

- **Statistics: 2 credits (30 hours); L, T, P, SPW**

1. Initiation to the bases of the inferential statistics
2. Descriptive statistics
3. Concept of probability, conditional probability
4. The main laws of chance
5. Confidence Intervals and Hypothesis tests in large samples

MIT114: Radiology Anatomy

- **Radiology Anatomy: 4 appropriations (60 hours); L, T, P, SPW**

The course of Radiological anatomy is based on the basic course of human Anatomy-Physiology. For each structure described in the basic course, supplements of anatomy description useful for understanding the radiological image, to the positioning of the patient or to the execution of specific maneuvers are made. Throughout these presentations, a particular effort is devoted to the understanding of the spatial configuration of the organs and structures described. Few marks of anatomy palpatoire are explained, so as to allow the correct positioning of the patient during the radiological examinations. These marks are shown concretely through exercise sessions of anatomy palpatoire, during which the students practice the a on the other the identification of structures accessible to the palpitation. For each body and structure, the image obtained in conventional radiology according to the implications of the most traditional is described. Each time there is a place, the images recorded by means of other techniques 'ultrasound, angiography, NMR, scintigraphy,…) are also explained. The iconographic documents are viewed, so static or dynamic sequences depending on the case, in the course of practical exercises conducted on computer

screen. After examination by the students themselves, clichés and sequences are projected on the big screen and are discussed under the direction of professor.

MIT115: Physical radiation of magnetic resonance of the Ultrasound and nuclear physics, General anatomy and physiology

- **Physical radiation of magnetic resonance of the Ultrasound and nuclear physics: 3 credits (45 hours); L, T, P, SPW**

1. **Introduction on the ionizing radiation**
2. **The X-RAYS**

-Production of RX unto tube to RX - spectrum characteristic - Braking unto RX of high energy unto quality of the radiation X unto mitigation of RX.

3. **The radiation ionizations in Nuclear Medicine**

-Constitution and dimension of the atomic nucleus unto classification and the properties of the particles unto the nuclear forces unto Default of mass and energy liaison of the nuclei unto natural and artificial radioactivity unto radioactive disintegration unto Diagrams of radioactive families unto Artificial Nuclear Reactions unto artificial radioactivity.

4. **Interactions of ionizing radiation with matter**

-Radiation directly and indirectly ionizing radiation unto the general aspect of the interaction between 2 charged particles unto linear energy transfer (TEL) unto linear density of ionization (DLI) unto interaction between electrons unto Contents unto Interaction heavy charged particles unto Contents unto neutron Interaction unto matter unto photon interaction unto matter linear absorption of photons.

5. **Ultrasound**

-The vibrations unto the airwaves Acoustic unto nature of its unto speed of sound unto acoustic pressure unto Energy, power, PFD and acoustic intensity transported unto the propagation of sound unto mitigation of its- Doppler Effect: fixed transmitter, mobile receiver unto mobile transmitter fixed receiver unto reflection of a wave on a moving barrier

- Ultrasound unto Definition Production unto unto explanation of the Piezo-electric effect unto Diagnostic Applications of us unto therapeutic action of the US.

6. **Nuclear magnetic resonance or Magnetic Resonance Imaging (MRI)**

- Magnetic moments and their behavior in a magnetic field- classic appearance and quantum.
- The basic principle of the MRI - time in MRI - the fields in MRI -behavior in magnetic moments in the magnetic fields.
- Magnetic Resonance - Action of the rotating field or the electromagnetic wave equivalent relaxation - NMR signal,
- Spatial localization - coding of the space by the frequency - First coding or selection of a cut - Locating a point on a cut

- Sequences of excitation used in imaging.

➢ **Anatomy and Physiology general: 2 credits (30 hours); L, T, P, SPW**

1. Osteology and arthrology
2. Neuro-anatomy and neurophysiology
3. Myology
4. Heart and blood vessels
5. Blood
6. Respiratory System
7. Digestive System
8. Immune System
9. Endocrine glands
10. Urinary system
11. The genital system (male and female)
12. Pregnancy
13. Growth
14. Senescence

MIT116: Clinical Internship (Immersion)

➢ **Clinical Internship (Immersion)**

MIT117: Methods of Work -Bilingual Training 1 - Techniques of Information and Communication 1

➢ **Methods of work: 1 credit (15hours); L, T, P, SPW**

1. Definition of concepts: Method, methodology, will, intelligence, knowledge, namely, organization, ability, memory, concentration
2. Symptom of a poor organization - the organization of the office
3. The management of the time - Synthesis and note taking
4. Preparation of the body for optimal learning: the power supply, relaxation, rest, physical and psychical
5. The organization of the work - the work environment
6. Reading: typologies, the taking of notes
7. Preparation for the review - the process of resolution of problems

➢ **Bilingual training 1: 1 credit (15 hours); L, T, P, SPW**

French expression

1. **Form of words in French**

- Prefix,
- Radical;
- Root, suffix.

2. Explanation of words and group of words

3. Morphosyntax and rhetoric

- Components and structure of the sentence:
  - Simple sentence;
  - Complex sentence;
  - Composed sentence.
- Figures of style:
  - Figures of analogy;
  - Figures of amplification;
  - Figures of opposition;
  - Figures of mitigation.

4. Administrative and professional correspondence

- The different parts of a administrative correspondence and the administrative style;
- Professional Correspondence:
  - Note of service;
  - Record (activity, mission);
  - The report (activity, mission).

5. Professional correspondence to individual dominance

- Application for employment;
- CV;
- Letter of motivation.

6. Methodological Considerations on the written exercises

- French composition;
- Contraction of text:
- French composition: Reminder methodological and implementation;
- Contraction of text: methodological reminder and application.

7. Study of the communication situations.

- Identification of the factors in the situation of communication (transmitter, receiver, code, channel, message, context);
- Situation of communication and verbal interactions;
- Study of the elements para verbal cues (kinesthetic, proxemics, MIMO-gestural, etc.;
- Identification and handling of figures of expression and thought metaphors, irony. Satire, parody, etc.); □ etc.

8. **Oral communication**

- **English Expression:**

Introduction - Course Content - Syllabus - Importance of English - Style in Business Writing - punctuation; capitalization - abbreviations.
The shares of Speech - Verbs - Question Words - Methodology: - of asking and answering questions

Economic Activities - Sectors of activity - Commerce and Trade Channels of distribution - Essay writing -specialized shops - active voice and passive voice - direct and indirect speech.

- **Techniques of Information and the communication I: 1 credit (15 hours); L, T, P, SPW**

1. Concepts and architecture of computers
2. Definitions: computing, information, computer, data, program, software, drivers
3. System of enumeration of base 2, the unit of measure of the information and its multiple
4. Components of the computer (hardware and software)
5. Study of an operating system
6. The devices (printers, scanner, …)
7. Study of a text treatment software: Microsoft Word

MIT121: Psychology and Relationship of Assistance - General Hygiene

- **Psychology and relationship of assistance: 2 credits (30 hours); L, T, P, SPW**

1. The experiences of Milgram
2. The relationship of care
3. Reflection: culture disease
4. The relationship of assistance
5. Brief overview of psychopathology
6. The death, mourning and the techno-scientific

- **General hygiene and hospitable: 3 credits (45 hours); L, T, P, SPW**

1. General, Definitions, epidemiology, Flores, germs, commensals, pathogens resistors, transmission route, Methods of Prevention
2. Antisepsis and disinfection, definitions, general principles, the main families of antiseptics and disinfectants, main indications and applications
3. Sterilization and single-use material, definitions and general principles, technical concepts, new technologies: Advantages and Limits, single-use material benefits and limitations, European legislation
4. Asepsis, general principles, prevention of infections, from the surgical site, urinary, related to the catheters, respiratory
5. Prevention of cross-transmission of infections, precautions standards, hygiene of hands, different types of insulation, objectives, practical achievements, surveillance, protective insulation
6. Hygiene of general services, waste management, maintenance of linen
7. Architecture, Design, situation in the hospital, ventilation, organization of own circuits and sales, materials of completion

MIT122: Care Techniques - Nursing - First Aid I, relationship, communication with the patient, Epidemiology

- **Techniques of care - Nursing - First Aid I: 2 credits (30 hours); L, T, P, SPW**
  1. Need to Move (manipulation of the bed, mobilization of the patient in bed and out of bed, position of the latter, surveillance and treatment of bedsores)
  2. Need to eliminate (elimination digestive - establishment of the bowl of bed, enemas, levies, care in case of diarrhea and constipation unto urinary disposals unto observation of the bladder drainage continuous, change of the bag collector or draining).
  3. Need for clothing (dressing and stripping of the patient with apparatus)
  4. Need to be clean (partial toilet or washboil)
  5. Need to breathe (oxygen therapy or aerosoltherapy)
  6. Need to Feed (installation of the patient for the meal, help to power, observation of dehydration, nausea, vomiting)
  7. Methods of investigations (statement of the temperature, blood pressure and pulsations)
  8. Monitoring (a patient plastered, post-operative, under infusion, of operative wound). Monitoring and knowledge of the symptom of shock
  9. Administration of Drugs (per-os, intramuscular, subcutaneous insulin-and anti coagulants). Dilution of a drug in an infusion
  10. Taking of blood and blood glucose levels at the end of the Finger
  11. Dressing of a simple wound
- **Communication Relationship with the patient: 1 credit (15 hours); L, T, P, SPW**
  1. Starting question: impact of the Universe hyper technicisé of medical imaging on the human relationship with the patient
  2. The rights of the Sick
  3. The expectations of the patient
  4. The home of the patient
  5. The information for the patient
  6. The most fragile patients
  7. The assertiveness and interactions, relational
  8. Reflection on the Exercise of the profession
- **Epidemiology: 1 credit (15 hours); L, T, P, SPW**
  1. Definition and generalities of epidemiology
  2. Approaches in epidemiology
  3. Interest of the epidemiology
  4. The frequency measures of health PWnomena
  5. Extent of morbidity and mortality
  6. Epidemiological Tripod: the epidemiological chain
  7. Epidemiological investigations and measures of association

8. Fight against an epidemic
9. Notions of sensitivity, specificity, predictive values
10. General prophylaxis of communicable diseases
11. Epidemiological surveillance and the PWnomena of mass.

MIT123: Radiation Protection and Biological Effects of Radiation

- **Radiation and biological effects of radiation: 4 appropriations (60 hours); L, T,P, SPW**

1. **Introduction to the dangers of ionizing radiation and to the protection against ionizing radiation**
   - Agencies at the origin of the Regulations - the international recommendations - Community legislation - reminders on ionizing radiation and on their interactions with matter - the protection against ionizing radiation.
2. **The quantities and units used in radiation protection**
   - Types of exhibitions - radiation field, fluence, fluence rate - Energie transferred, disseminated, absorbed - Kerma - absorbed dose - relationship between the Dosimetric Quantities - equivalent dose - Effective Dose - committed equivalent dose - the committed effective dose -concepts of collective dose.
3. **The Radio external exposure**
   - Measurement of the external exposure - protection against external exposure - the radioactive contamination - Contamination of the Environment - Contamination of places of work - dermal contamination.
4. **The radio internal exposure**
   - Quantification of the internal exposure - protection against the internal exposure - internal contamination.
5. **The detection of ionizing radiation**
   - Used dosimeters in radiation protection - General Principles - principle of Individual dosimeters.
6. **The Biological Effects of Ionizing Radiation**
   - The physical interactions - the Radiochemical reactions - the molecular lesions - the mechanisms of molecular lesions - the nature of the molecular lesions - the cellular damage - cell death - neoplastic transformation - hereditary effects - factors of cellular radiosensitivity - the tissue injury - the pathological effects of ionizing radiation in humans The deterministic effects - the stochastic effects.
7. **The inventory of human exposures**

- The Human Exposure of natural origin - the medical exposure - the exposure due to the nuclear test explosions. The exposure of industrial origin - the exposure of domestic origin - the incidents and accidents of exposure - the accidents of large scope - the incidents and accidents of restricted scope - the contention of the accidents.

8. **The legislation**

MIT124:Ergonomics, General description of the devices and technology

- **Ergonomics: 3 credits (45 hours); L, T, P, SPW**

- **First part:**
  1. The manual taken;
  2. The positions of the patient;
  3. The maneuvers of handling;
  4. Flipping and side to side movement;
  5. Enhancement, transfer: "Wheelchair stretcher";
  6. The chronology of the maneuvers of handling;
  7. The material aid.
- **Second part:**

- **General description of the devices and technology: 2 credits (30 hours); L, T, P, SPW**

  1. Part 1: Techniques using ionizing radiation (Rx, gamma radiation).
  2. Part 2: Techniques without ionizing radiation (MRI).

MIT125:Work practices of chemistry, microbiology, physics and electricity

- **The work practices of chemistry: 1.5 credits (22.5 hours); L, T, P, SPW**
- **Work microbiology practices: 1.5 credits (22.5 hours); L, T, P, SPW**
- **Practical work physics and electricity: 2 credits (30 hours); L, T, P, SPW**

MIT126:Internship Dosimetry and ultrasound Internship

- **Dosimetry internship: 2 credits (30 hours); L, T, P, SPW**

The reviews relate to different stages of the treatment in radiotherapy:

1. Know the different stages of processing;
2. Perform the quality control and the treatment plan in 2D and 3D ;
3. Illustrate the physical principles and the indices of quality and safety seen during the course.

- **Ultrasound internship: 2 credits (30 hours); L, T, P, SPW**

Discover and know the role of the technologist in ultrasound and ultrasound Doppler:

1. Put into practice the bases of the ultrasound and the physics of ultrasound;

2. Know the equipment used;
3. Type of equipment (ultrasound, vascular ultrasound);
4. Settings (The types);
5. Equipment Annex (consoles of viewing and archiving); - the imaging systems of reproduction (paper, films).
6. Know the techniques of examinations to know:
7. The different examinations performed;
8. The main indications (most common);
9. The different preparations;
10. Information to patients;
11. Learn how to prepare and have the patients for routine examinations;
12. Observe the various parameters, settings and necessary probes to ultrasound Explorations (what frequencies used and why);
13. Recognize on the images obtained the hasnormalnatomie of pathological anatomy.

MIT127: French - Medical English I

- **French - Medical English I: 3 credits (45 hours); L, T, P, SPW**

1. Grammar (identification for different partof speech, construction of tenses concords)
2. Anatomy (naming of body parts especially the reproductive system)
3. Construction of medical terms (medical terminology including priority health program, and their nomenclature in both language)
4. Translation of documents
5. Description of the health structure and component in both language
   - Naming of instruments used in the hospital;
   - Identification of personnel in the hospital (categories);
   - Units and departments of the hospital.

MIT231: Radio pharmacology and product of contrast, nuclear medicine and Radiochemistry

- **Pharmacology radio and product of contrast: 2 credits (30 hours); L, T, P, SPW**

1. Basic Concepts of Pharmacology;
2. Pharmacology;
3. Pharmacokinetics and toxicology;
4. Products of X-ray contrast, US, NMR;
5. Pharmacy radio: Radioactive kinetic, interactions matter and living, radiobiology, radio toxicology, radiochemistry, radio pharmacy and special general including insurance and quality control.

- **Nuclear Medicine and Radiochemistry : 3 credits (45 hours); L, T, P, SPW**

1st part: Apparatus in Nuclear Medicine

1. Reminders of physical principles;
2. Performance of the equipment;
3. Modality of use;
4. Quality checks;
5. Demonstration.

2nd part: The tracers in Nuclear Medicine

1. The main radio-isotopes and indications;
2. Preparation of radio-plotters;
3. Chemical aspects physiological and;
4. Review of the Isotopes used the most.

3rd part: Musculoskeletal System

1. The tracers

1. Implementation of the review and positioning;
2. Interpretation;
3. The main indications;
4. EndocrinePathologies, Thyroid, Parathyroid, Adrenal gland, uronephrologic system genital and;
5. General principles of the Examinations uronephrologic;
6. Physiology of plotters.

2. Digestive System

1. Isotopic exploration of the function of gastric emptying;
2. Study of the hepatocyte function and bile;
3. The Respiratory tests;
4. Inflammatory and infectious diseases;
5. Principle of preparation of labeled cells;
6. Imaging and main indication.

3. Anatomy cardio-vascular

1. Principles and method of assessment of myocardial perfusion;
2. Study of the viability;
3. Evaluation of ventricular function.

4. Respiratory System

1. Study of pulmonary perfusion;
2. Study of the pulmonary ventilation.

5. Central Nervous System

1. Study of the Cerebral Perfusion and dynamic test;
2. Introduction to brain receptors;
3. The Principles of therapy per radionuclide;
4. The PET scan-principle and indication in oncology, cardiology and neurology;
5. Patient preparation and practical realization;

6. Introduction to the isotopic techniques (non-PET) used in oncologiescintimammographie-detection of sentinel node-scintigraphy of hormone receptors.

MIT232 : Radiation- Protection and biological effects of ionizing radiation, Computer science applied to the imaging I

- **Radiation and biological effects of ionizing radiation: 2 credits (30 hours); L, T, P, SPW**

1. Introduction to the dangers of ionizing radiation and to the protection against ionizing radiation

- Agencies to the origin of the Regulations unto the international recommendations e Community legislation unto reminders on ionizing radiation and on their interactions with matter unto the protection against ionizing radiation.

2. The quantities and units used in radiation protection

- Types of exhibitions unto radiation field, fluence, fluence rate unto Energie transferred, disseminated, absorbed unto Kerma unto absorbed dose unto relationship between the Dosimetric Quantities unto equivalent dose unto Effective Dose unto committed equivalent dose unto the committed effective dose unto concept of collective dose.

3. The Radio external exposure

- Measurement of the external exposure unto protection against external exposure unto the radioactive contamination unto Contamination of the Environment unto Contamination of places of work unto dermal contamination.

4. The radio internal exposure

- Quantification of the internal exposure unto protection against the internal exposure unto internal contamination.

5. The detection of ionizing radiation

- Used dosimeters in radiation protection unto General Principles unto principle of Individual dosimeters.

6. The Biological Effects of Ionizing Radiation

- The physical interactions unto the Radiochemical reactions unto the molecular lesions unto the mechanisms of molecular lesions unto the nature of the molecular lesions unto the cellular damage unto cell death unto neoplastic transformation unto hereditary effects unto factors of cellular radiosensitivity unto the tissue injury unto the pathological effects of ionizing radiation in humans The deterministic effects unto the stochastic effects.

7. The inventory of human exposures

- The Human Exposure of natural origin unto the medical exposure unto the exposure due to the nuclear test explosions. The exposure of industrial origin unto the exposure of domestic origin unto the incidents and accidents of

exposure unto the accidents of large scope unto the incidents and accidents of restricted scope unto the contention of the accidents.

8. **The legislation**

- **Computer science applied to the imaging I: 2 credits (30 hours); L, T, P, SPW**

1. General Presentation and history
2. The user (login, password)
3. The file system (tree, path, handling)
4. The protection of files
5. A text editor (vi)
6. The shells of command
7. The redirection
8. The tubes of communication

MIT233: Techniques of positioning and training of images I

- **Techniques of positioning and training of images I: 6 credits (90 hours); L, T, P, SPW**
  Ultrasound and Doppler, gyneco (IM2TECDOGY)
  Emergencies, chest, ends (IM2 TUrThEx)
  Abdomen, Uro-Hepato, Gastro, cardio, Brain - Neck (IM2TAUHGCC)

1. Ultrasound imaging and Doppler
2. Theoretical bases on the acquisition of information and the training of the image accompanied by illustrations
3. Emergency action to be taken by the technologist in Imaging respond to emergencies: Supported adapted to the patient, realization of the balance sheet imaging with speed and efficiency, monitoring of vital signs, choice of supervisor, limits of its actions on the ground and commitment of its responsibility
4. UroHepato strategies of exams Rx us - CT and MR in the urologic pathology and hepatic, illustrated by the most common illnesses in these areas gastrotechniques, products of contrast and drugs used for the achievement of the conventional radiology of hypo pharynx, esophagus, stomach, duodenum, of the small intestine, and Colon
5. Application of basic pathologies
6. Gyneco HysteroSalpingographie, radiological examination consisting of the opacification of the genital tract women (uterus and fallopian tubes) - Breast Health or breast imaging:
7. Achievement of a standard review of mammography. After a few words on the breast cancer, its factors and risk, its clinical presentation, a description of the clinical examination, reminder of the indications of the mammographic examination, the modalities of the achievement of this review are described in insisting on the technical requirements and the quality criteria

8. Realization of additional shots made in mammography with description of the technical realization of these different incidence (snapshot rolled, profile, expansion, compressive centered, etc.)
9. The interest of the other reviews senologiques (ultrasound, scanner and Magnetic Resonance Imaging)
10. Adaptation of the examination to some special clinical circumstances, requiring dose modifications, the realization of clichés individuals (within inflammatory, follow-up after treatment of breast cancer, followed after establishment of prostheses, exploration in humans)
11. In Interventional breast health with a description of the different modalities, information on the equipment, the technical realization under ultrasound control or mammography and the technical realization under ultrasound control or mammography and the indications (cytoponction to the fine needle, gaseous kystographie, micro-biopsy, macro-biopsy, cutaneous Levy, scrapping and punch biopsy, tracking galactogrophie pre-surgical, x-ray and ultrasound of exhibit operative)
12. Technical chest of the x-ray and thoracic standard. Indications for the achievement of the standard radiography of the thorax. Notions of chest pathology

MIT234:Recording techniques, processing and printing of images1 (IM2TRTLM1)

- **Treatment of Image 1: theoretical and practical aspects: 2 credits (30 hours); L, T, P, SPW**
  - **1-** Photometry
    - Definition of the different quantities photometric: luminous power, light intensity, luminance, illumination and exposure; **-** difference and links between these sizes; **-** use of each magnitude.
  - **2-** Principle of photography by Radius X
  - **3-** The characteristics of the films contrast and gamma, grain and granularity, sharpness and acutance, resolution and curve MTF (Modulation Transfer Function), sensitivity and sensitometric curve
  - **4-** Composition of films for RX. Relationship between the composition of the film and its characteristics
  - **5-** The different stages of development of the films for RX. The role of different parameters of development: temperature of the baths, duration of development, etc.
  - **6-** Sensitometric curve : sailing, characteristics of an emulsion under- or over-exposed
  - **7-** The intensifying screens
  - **8-** The different types of screen-film combination

What torque to choose for what use? (Lung radios, the trunk, extremities, etc.).

The practical part consists of:

- The use of a software image manipulation (GIMP);
- The implementation in practice of the concepts studied in the first part.

- **Treatment of Image 2: theoretical and practical aspects: 2 credits (30 hours); L, T, P, SPW**

1- The models of colors

- The RGB (Red Green Blue);
- CMY (cyan magneta yellow);
- YcbCr;
- HSV.

2- The image formats: BMP

- Description of the model;
- Structure of a file;
- Compression.

3- RLE: GIF

- Description of the model;
- Compression Algorithm, and LZW decompression;
- Structure of a GIF file;
- JPEG;
- Principle of the Encoding sampling and model of colors;
- cosinetransform discreet;
- Quantification.

4- Coding of Huffman: PNG

- Description of the model;
- Algorithm for compression and decompression LZ77: comparison between the different formats.

NB: Each of the chapters is illustrated by practical exercises and complete by achievement of a work of synthesis on the different formats of images.

- **Scanner: 1 credit (30 hours); L, T, P, SPW**

1. Principles of bases and sequential scanner
2. Helical scanner mono and multi strips
3. The quality factors of the image
4. Post processing of images
5. Strategies for the acquisition and use of the products of contrast

MIT235:Hospital management

- **Hospital management: 3 credits (45 hours); L, T, SPW**

1. Health Organization in Cameroon

- Mission of Health training on the national territory: health center, district hospitals, hospitals, central and regional, general hospitals, CHU, private hospitals and clinics laity and confessional, liberal medicine;
- Hospital reform, interrelation with national organizations that contribute to the health and the fight against poverty (other government departments, donors, international organizations, NGOS, associations).

2. Organization of health training, public and private

- Legislation which applies to health training;
- Economic and Financial Management;
- Workforce management Workforce management, staff and the continuous training;
- Management of care and drugs.

MIT236:Internship MRI and MRI Ability

- **MRI internship and MRIAbility: 4 appropriations (60 hours); P, SPW**

1. Understand (in collaboration with the TRM or the doctor radiologist) the statement of the request for review:
2. Accommodate the patient and the support, explain the conduct of the review and highlight the against-possible indications to the review (essential);
3. Prepare equipment (antenna, containment,…) and argue the choice;
4. Put a infusion and inject the gadolinium by this infusion, choose the protocol of the review;
5. Install the patient depending on the protocol chosen (ensure respect for his person as well as to its comfort);
6. Practice routine examinations and learn to manage a program of patient;
7. Position the slices on the topogram and perform the necessary changes as a function of the structure sought (number of slices, thickness, dimensions, orientation, pre-saturation) and launch a sequence;
8. Apply all the principles of resonance acquired previously;
9. Recognize the main sequences used (ES/EG/IR/fast imaging);
10. Recognize the weighted images in T1 and T2;
11. Identify the key artifacts encountered (flows, movements …);
12. Best optimize the parameters of acquisition (acquisition time, matrix, resolution);
13. Choose the correct Windows In contrast of images provided to the radiologist;
14. Recognize on the images obtained, the normal anatomy of the Pathological Anatomy;

15. Take in hand of patients unstable and work in a quick way and effectiveness (AVC, patient of intensive care).

MIT237: Information andCommunication Technologies II and Civic Education and Ethics

- **Information and Communication TechnologiesII: 1 credit (15 hours); L, T, SPW**

1. Study of a spreadsheet/Microsoft Excel
2. Study of a presentation software: Microsoft PowerPoint
3. Study of a software for the creation and querying databases (Microsoft Access).

- **Civic Education and Ethics: 2 credits (30 hours); L, T, SPW**

Presentation of concepts:

- The citizen;
- The Nation;
- The State;
- Publics Property and collective's goods;
- The freedoms;
- The public service;
- Ethics;
- Ethics, Law and reason;
- Ethical Problem ;
- Ethics and management.
- Civics
- Deontology
- Moral consciousness
- The universal declaration of Human Rights
- Good governance in public services
- The importance of civics to the life of the nation
- Functions of the state and its citizens
- Deontology, Professional ethics and professionalism
- Relationship between morality, law and ethics
- Codes of ethics

MIT241: General pathologies - Hematology

- **General pathologies: 2 credits (30 hours); L, T, P, SPW**

1. Introduction: The mechanism of the disease, clinical examination, diagnostic value of the tests, Epidemiology
2. The water and electrolytes, acid-base balance
3. The disorders of the renal function

4. The cardiovascular system
5. The respiratory pathologies
6. General principles of oncology
7. The hematology
8. The Musculoskeletal System, rheumatology and traumatology
9. Endocrinology
10. Gastro-enterology, including diseases of the liver and gall bladder
11. Elements of clinical neurology

- **Haematology: 3 credits (45 hours); L, T, P, SPW**

First part: Elements of Hematology

1. Peripheral blood
2. Composition
3. Haematological cells: description, role, duration of life, apoptosis,
4. Parameters of the blood cell count,
5. Hematopoietic organs and Associates
6. Marrow, thymus, Ganglia, lymphoid formations
7. Hematopoiesis
8. Transport of blood cells
9. Blood circulation,
10. Lymph circulation
11. Hemostasis
12. Immunohematology
13. Blood groups,
14. Application: Transfusion, tests pre transfusion.

Second part: diseases of the blood and medical imaging

1. Lymphoma
2. Myeloma
3. Thromboembolic disease
4. Infection: detection of infectious homes
5. Disease of the erythrocytes
6. Iron metabolism

MIT242:Techniques of care - Nursing - First Aid II

- **Technical of care - Nursing - First Aid II: 4 appropriations (60 hours); L, T, P, SPW**

Introduction

1. The design of health and disease;
2. The Nursing;
3. Approach to a patient in its entirety.

1. Hospital hygiene

- Definition;
- Mechanism of infection; - Hygiene of the staff.

2. Handling of Patients

- Definition;
- How to address the handling;
- The main techniques of handling used in a radiology service,
- Incidents, complications;
- Risk prevention, protection of the caregiver.
- Pharmacology

3. The Vital Signs

- The temperature is taken;
- The breathing;
- The extent of the arterial pulse;
- The measurement of the blood pressure.

4. The achievement of dressings

- The Bandage simple;
- The drainage of wounds and the dressing of in drain.

5. The intravenous fluids

- The puncture of blood and blood sampling;
- Placement of a track of entry periPWral venous;
- The preparation of infusions and the manipulations of drugs;
- The withdrawal of the infusion;
- The track central venous;
- The puncture of a port to cath with injection of drugs;
- The withdrawal of the needle placed in a port-a-Cath.

6. The administration of medication in intramuscular injection

- Definition;
- The location of the site of injection;
- The technical equipment;
- The complications, incidents.

7. The administration of medication subcutaneously

- Definition;
- The location of the site of injection;
- The Hardware
- Technique;
- The complications, incidents.

8. The rectal probe and the enema

- Definition;
- Elements to be taken into consideration for the administration of an enema
- The hardware;
- Technique;

- The complications, incidents.

9. The Oxygen Therapy

10. Acts of assistance when handling interventional techniques

- The preparation;
- The conduct of the review.

11. Management and Small maintenance of equipment, apparatus and products

12. Other types of equipment and definition of terms

13. Emergencies and reanimations

- The respiratory arrest,
- Cardio-respiratory arrest or ARCA,
- The anaphylactic shock,

Conclusion

MIT243:Community Health, Computer Science applied to the Imaging II

- **Community health: 2 credits (30 hours); L, T, P, SPW**

1. Definition of concepts: health, community, community health, public health, community diagnosis, community participation, health development, relationship between health and development
2. Concepts on the promotion of health
3. Notions of needs and problems of public health
4. Concept of request/ supply of health care
5. Analysis of individual needs and the community
6. Study of the Determinants
7. Establishment of the profile of the community.
8. Methods and tools for data collection
9. Identification of key informants at the local level
10. Identification of priority problems in community health
11. Formulation of objectives
12. Identification of resources
13. Choice of strategies and interventions
14. Analysis of the Strengths, Weaknesses, Opportunities and Threats
15. Formulation of the program of intervention and Budgeting
16. Monitoring and Evaluation

- **Computer science applied to the Imaging II: 2 credits (30 hours); L,T, P, SPW**

1. Networks and Transmission
2. General introduction to telematics
3. Introduction to communication networks
4. The direct network (leased line)
5. The telephone network
6. The packet-switched network
7. The TCP/IP network

8. The network frame-relay
9. The ATM network
10. Concepts of local network
11. The requirements for the transmission of voice
12. The requirements for the transmission of the image fixed;
13. The requirements for the transmission of the moving image
14. The characteristics of the networks
15. The problem of the isochronism
16. Comparison of the networks and their ability to transmit the image DICOM medical (Digital Imaging and Communication in Medicine) is a standard used in medical imaging
17. PACS (Picture Archiving Communication System) is an integrated system of archiving and communication of medical images
18. Presentation of the Telemis software: software for secure distribution of medical images
19. The medical record
20. The computer through the hospital

MIT244:Quality control in conventional radiology (ISO 9001) Environemental management system (ISO 14001) and the patient protection

- **Quality Control: 4 appropriations (60 hours); L, T, P, SPW**
  1. **Quality control to the patients:**
     - H. Michel
     - Introduction to a quality approach;
     - What is the quality;
     - TQM/quality assurance;
     - Home and patient satisfaction;
     - Inquiry;
     - Standards of home;
     - Introduction to Quality Control: (quality of the treatment and safety of the patient)(ISO 9001),
     - In radiotherapy;
     - In radiology.
  2. **Quality control In radiotherapy**
     - S. Vynckier;
     - Importance;
     - Recommendations;
     - Quality control of devices of treatment;
     - Quality controls; Mechanical
     - Controls of dosimetric qualities;

- Quality control systems for the planning;
- Quality control of scanners for use in radiotherapy; - dosimetry in vivo.

3. **Quality control radiology**
   - J. Causing;
   - Evaluation of doses to the patient;
   - Medical exposures;
   - The quantities used in patient dosimetry;
   - Measurement and Calculation of patient doses;
   - Ct scan;
   - Barium enema;
   - Interventional chest;
   - Optimization of the dose to the patient;
   - Reference level;
   - Factors of optimization;
   - Optimization of the dose and the quality of the image;
   - Quality control.
4. **The quality assurance**
5. **Legal aspect of quality control**
6. **Quality control in mammography**
7. **Criteria of Quality of image,**
8. **Criteria for acceptability of facilities**
9. **Environemental management system (ISO 14001)**
10. **The patient protection**

MIT245:Education for the health and life cycle

- **Education for Health: 2 credits (30 hours); L, T, P, SPW**

1. Context and Problem of education for the health
2. Definition of certain general concepts related to education for health
3. The communication process
   - The barriers to communication;
   - The channels of communications;
   - The principles of good communication;
   - Types of communication.
4. Techniques and strategies of communication
5. Objectives, goals and priorities of the Education for the health
6. Basic principles, levels of intervention of the communication
7. Methods : presentations, meetings, role play, case study, demonstration, etc. their classification, criteria of choice
8. Means used in education for health: their classification, criteria of choice
9. Group Dynamics: JOHARI Window
10. Organization of an educational talk and its stages
11. Organization of a home visit is its steps

12. Layout of Tables during the sessions of the animation.

- **Life Cycle: 2 credits (30 hours); L, T, P, SPW**

1. Introduction: embryological Terms
2. Initial stages
3. Gamete
   - 1St week of development;
   - 2th week of development (the embryo didermique);
   - 3th week of development (the trilaminar embryo).
4. Embryonic period (the 4th week at the 7th week)
5. Organogenesis and elements of teratology
6. Introduction to the growth and development
7. Prenatal stages, neonatal, childhood, adolescence and senescence
8. Human Genetics
9. Inheritance and Counselling
10. The reproductive system of male and female infertility, male and female, mammary glands and lactation

MIT246: Nuclear Medicine Internship, Internship scanner and scanner Ability

- **Nuclear medicine Internship and internship scanner and scanner ability: 6 credits (90 hours); P, SPW**

Preparation of the review:

1. Organize the unfolding of the working day
2. Search for the radiological data of the patient (comparative, reports,…)
3. Choose the protocol of the review
4. Perform the settings machines in function of the examination to be carried out and the Protocol choice,
5. Check the facilities of emergencies in ensuring their proper functioning
6. Prepare the product of contrast and the Inject when this is necessary
7. Quote the emergency medicines and pharmaceutical products surge capacity in explaining their function and dosage
8. With the patient ask a track venous and prepare an infusion. In the course of the review:
9. Perform only the examinations regularly practiced in the service
10. Select and adjust the parameters of use and acquisition of each of the devices used;
11. Adapt in function of the conduct of the examination (technical choices, choice of medical equipment, attitude toward the patient…)
12. Choose the hardware correctly for single use, the use of economic manner and handle in sterile way

MIT247: Initiation to Research, GeneralEconomics

- **Initiation to research: 1 credit (15 hours); L, T, SPW**

  1. Introduction to the search
  2. Approach of the research: construction of a hypothesis, experimentation, validation, conclusion
  3. Implementation of a research protocol
  4. Bibliographical research
  5. Ethics in Health Research
  6. Critical reading of scientific articles
  7. Drafting and scientific presentation
  8. Preparation and Presentation of Research Reports
  9. Case practice: drafting of protocols of research

- **Construction of a Research proposal**: **Background:** Literature review, formulating the problem statements, justification of studies, objectives, framing the questions according to general and specific objectives; is developing a testable hypothesis to achieve the objectives for quantitative research selection, referencing, etc.; Ethical considerations; Work plan: personnel; timetable project administration; Plans for dissemination.
- **Data collection and management**: Design and Pretesting of measuring instruments (reliability and validity of instruments);training of interviewers; quality control of measurements; computerization, checking and validating, measurements; the issue of missing observations, statistical summarization of information; testing of hypothesis.
- **Analysis & presentation of Results; Report writing and format.**
- **General Economics: 2 credits (30 hours); L, T, SPW**

1. International economic relations

- Areas of economic exchanges;
- Specialization and international trade;
- International payment;
- Construction.

2. The economic policies

- The objectives: growth, employment, prices, external trade;
- The means: Policies fiscal, monetary, industrial and employment policy and training.

3. Economic circuit and national accounting

- Institutional Sectors, flow accounts, table (table of the whole economic activity, table input/ ouput, table of financial operations), aggregates and ratios.

4. Evolution of the final consumption, gross fixed capital formation (GFCF) and savings.

MIT351:Family planning, maternal and child health

- **Family Planning (PF): 0.5 credit (7.5 hours); L, T, SPW**
  1. Integration of the PF in the SSP
  2. Nutritional surveillance of the mother and of the Child
  3. Policy of breastfeeding
  4. The standards of services of maternal and child health (MCH)
- **Intrapartum Care: 0.5 credit (7.5 hours); L, T, SPW**
  1. Home and installation of the Nursing mother
  2. Preparation of equipment
  3. Monitoring the work (partogramme)
  4. Normal issuance
- **Post-partum care to: 0.5 credit (7.5 hours); L, T, SPW**
  1. Care of the mother: vulva, perineum, breasts
  2. Monitoring of the parameters and the risk of posPHartum

- **Care of new-born: 0.5 credit (7.5 hours); L, T, SPW**
  1. Immediate care: liberation of the respiratory tract, eyes, umbilical cord, toilet
  2. Search for Obvious malformations
- **Breast-feeding: 0.5 credit (7.5 hours); L, T, SPW**
  1. Within the new-born
  2. Lactogenesis
  3. Maintenance of the lactation
  4. Benefits and contraindications to breastfeeding
- **Artificial feeding: 0.5 credit (7.5 hours); L, T, SPW**
  1. Disadvantages of breast milk substitutes
  2. Food diagram, withdrawal, ablactation
  3. At the time of taking care of a Nursing mother, the nurse directs its actions on the IEC around the food hygiene, the rest of the mother and the home to the new-born
- **Gynecological Care: 1 credit (15 hours); L, T, SPW**
  - **Care are specific to gynecological pathologies, it is:**
  - The care pre and post operative of the gynecological surgery Breast and;
  - Of the IEC, which will be oriented on the sexual education and on the risks of infertilities, after the gynecological infections neglected.

MIT352 : Techniques of image position: Radio-conventional, Dosimetry, MRI – Pediatrics

- **MRI - Pediatrics: 2 credits (30 hours); L, T, SPW**

Practical modalities of realization of a MRI examination relative contraindications and absolute, preparation of the patient; choice of hardware (antennas, containment,…) Programming sequences and manipulation of the console, reproduction, reconstruction and archiving of images. The Artifacts Arts facts related to the patient artifact related to magnetic field, artifact related to calculation of the image; interpretation of the signal and the contrast in the IRL; List of Entities causing a high signal e, TI List of Entities causing a high signal in T2, list of years causing a low signal in MRI contrast products in MRI. What product to use; presentation of the different reviews in MRI modality and preparation MRI of the brain RM spine MRI; Angio member cardiac MRI MRI abdomen, MRI pediatric; quality of the MRI image; influence of the receiving equipment; influence of geometric parameters influenced the parameters of pulse.

- **Clinical MRI (IM2TECHTRM): 1 credit (15 hours); L, T, SPW**

Sequences of pulses and weights, filling the space-k, acquisition parameters and quality imaging, MRI angiography, diffusion imaging and infusion, functional imaging (bold), Spectroscopy.

- **Os and Positioning (IM2TECHRDC): 2 credits (30 hours); L, T, SPW**

Technique of correct positioning of the patient for each impact, implementation adequate place of the equipment for the realization of the snapshot (TABLE, TUBE, filters, collimation, chair or stretcher). Approach In free tube and on remote-controlled table. Handling of the patient for the dynamic tests.Measures of radiation protection for the patient and the technologist.Study of the imagery of reference to identify the criteria for success.

Positioning

This course of practice positioning refers strictly to the theoretical course.

MIT353: Special pathologies Pediatric – ENT

- **Special pathologies pediatric - ENT: 6 credits (90 hours); L, T, SPW**

1. **Pediatrics Neonatology**
   - Intrauterine life;
   - The adaptation to the extrauterine life;
   - The common ailments of the neonatal period; - Breastfeeding;
   - The pain in the child.
2. **The pathologies of the infant and the child**
   - Elements of pediatric gastroenterology;
   - Spitting up and vomiting;

- Tears of the infant;
- Abdominal pain acute of the child;
- Evaluation of the dehydration;
- Hirschsprung disease;
- Accidental ingestion of caustic soda;
- Mérycisme and anorexia;
- Celiac disease;
- Cystic Fibrosis;
- Intolerance to lactose ;
- Cow's milk protein allergy.

3. **Infectious pathologies in the child**
   - The acute fever in children;
   - The rash illnesses of the child;
   - Meningococcemia;
   - The other contagious diseases of childhood;
   - The recommendations in the area of immunization diagram in the child.
4. **The respiratory diseases in children**
5. **Sudden death and malaise of the infant**
6. **Nephrourology Pediatric**
7. **Haematological disorders**
8. **ENT.**

MIT354: Special Gynecological and Neurological Pathologies

➢ **Special neurological Pathologies: 2 credits (30 hours); L, T, P, SPW**

1. **Neurology**
   - Anatomy elementary neuroradiological;
   - Traumatic pathology, tumor cells, inflammatory and infectious diseases, vascular disease (including malformations) of the brain ;
   - Traumatic pathologies, degenerative, metastatic and of the Bone Spine;
   - Semiology of basis of the spinal cord.

➢ **Special gynecological Pathologies: 2 credits (30 hours); L, T, SPW**

1. **Gynecology :**
   - Summary of the theoretical and practical knowledge;
   - Clinical cases concrete and algorithms of reflection diagnostic and therapeutic treatment.

MIT355:Computer science applied to the Imaging III

- **Computer science applied to the Imaging III: 4 appropriations (60 hours); L, T, P, SPW**

1. **Extension of the concept of signal to images**
   - General information on the major medical imagers;
   - Main characteristics of medical images.
2. **Introduction to the treatment of medical images**
   - The methods of filtration;
   - Elements of Mathematical Morphology;
   - Analyzes and segmentation.
3. **The Algorithms for viewing**
   - Visualization of surfaces;
   - Display of volumes;
   - Animations.
4. **Computer implementation**
   - Introduction to the coding and the transmission;
   - Software integration.
5. **Applications**

   Imaging to two dimensions;
   - Imaging to three dimensions for the theoretical part, students participate in the course given to Louvain la Neuve in the framework of the license in medical biology.
   - Practical exercises in direct link with the concepts views to the theoretical courses are offered to students, they are to perform different treatments on medical images anatomical and functional.

MIT356: Conventional ImagingInternship

- **Conventional imaging Internship: 4 appropriations (60 hours); P, SPW**

1. Understand the conventional imaging and its different aspects to the sides of the diagnostic imaging (vascular, digestive, urologic, biopsies)
2. Describe the examinations performed
3. Accommodate the patient and the support according to the rules of professional ethics and explain the conduct of the review by providing the necessary information to the patient and his entourage
4. Install the patient depending on the protocol chosen (respect for the person and its comfort), perform several acts nurses (tables and sterile fields, hygiene, establishment of a infusion)

5. Define the protocol of the review and the modulate in function of a possible specific request
6. Provide in a sterile manner, the equipment requested by the radiologist, meet the requirements desired by the Radiologist (in the course of the intervention)
7. Be familiar with the different catheters, bloating and introducers used their dimensions
8. Maintain a follow-up contact with the patient during the examination, in order to ensure its monitoring and, to the need to reassure
9. Respect and ensure respect for the rules of safety and radiation protection
10. Perform the acquisition of images
11. Recognize on the images obtained the normal anatomy of the Pathological Anatomy;
12. Identify the key artifacts encountered
13. Interested in the Principle of operation of the equipment
14. Check the emergency installations in ensuring their good functional; Ranger and clean the room after review,
15. Respect the rules of hygiene and eliminate waste in respecting the environment

MIT357: Medical Law and LegalEnvironment

- **Elements of labor law: 1 credit (15 hours); L, T, SPW**

1. The sources of labor law
2. The work contract
3. Collective labor relations

- **The elements of health at work: 1 credit (15 hours); L, T, SPW**

1. General information
2. Ergonomics of the work station
3. Prevention of work accidents
4. Hygiene of workers and of premises,
5. Medical surveillance of workers - vaccination
6. IEC on the use of protective equipment (rear window, gloves, helmets, etc.)
7. Fight against alcoholism in the workplace

- **Elements of school medicine: 1 credit (15 hours); L, T, SPW**

1. Definition and Purpose
2. Medical examinations and school medicine the physical and psychological
3. The schooling of deficient, the disabled, children in difficulty
4. Control and Prevention of risks in the school environment
5. The school environment

- Standards for the construction and installation;
- Ergonomics of premises, the sanitary facilities;
- Hygiene of the premises, food hygiene canteens;
- The Infirmary in school environment;
- The IEC in the school environment.

MIT361:Angiography and Interventional Radio and Endoscopy

- **Angiography and Interventional Radio: 5 credits (75 hours); L, T, SPW**

1. Introduction radiological anatomy (Reminders), vascular pathology
2. Vascular Radiology
3. Vascular interventional radiology
4. Cardiology
5. Electrophysiology and manipulations
6. Interventional Neuroradiology
7. Interventional radiology non vascular
8. General Conclusions
9. Prospects for the future and critical analysis and invasive imaging non-invasive, progress in non-invasive imaging of the Heart
10. Future of interventional radiology.

MIT362: Specific right and organization of work

- **Specific right and organization of work: 4 appropriations (60 hours); L, T, SPW**

First part:

1. Definitions : The law, ethics and ethics
2. The professional secrecy
3. The right and medical imaging
4. The point of view of "users"
5. Carers and cared: pluralism of cultures
6. Analysis of a clinical situation: the modesty

Second part:

1. Structure of the hospital and Organization Chart
2. The traditional theories of organization of work: classical theories, theories humanists
3. The new forms of work organization
4. The versatility
5. The scheduling of work in a the imaging service
6. Practical organization in medical imaging in the short, medium and long term.
7. Elements of social right

MIT363: Pediatric Imaging, Dosimetry

- **Pediatric Imaging: 2 credits 30 hours); L, T, SPW**

1. Specific radiation protection and problematic to the pregnant woman
2. Technical and thoracic pathologies and upper airway
3. Techniques and traumatic pathology of the skeleton
4. Technical and digestive diseases
5. Technical and urinary pathologies

- **Dosimetry: 1 credit (15 hours); L, T, SPW**

1. Description of the different detectors. dosimetric Description of the dosimetric protocols
2. Description of the methods of planning a treatment therapeutic radio

MIT364: Special ExaminationsInternship and Operating Room

- **Special examinations Internship and Operating Room: 5 credits (75 hours); P, SPW**

- Learn to return and to went out of the room of operation;
- Acquire the attitudes required in the district procedure;
- Meet the requirements of aseptic;
- Learn how to contribute to the use of medical imaging techniques in the course of interventions;
- On the musculoskeletal system (Orthopedics);
- On the digestive system (endocrinology); - on the nervous system (neurosurgery).
- The reviews relate the techniques of exploration which require very specific conditions of aseptic and which can higHCMight specific pathologies thanks to the arthrographie.
- Take charge of all the requirements of aseptic necessary for the examination; this concerns:
  - The preparation of the room and its storage compartment;
  - The preparation of the equipment and products used for the review;
  - The framework of the patient, preparation for the review, monitoring and collaboration during the review, referral of the patient after the review:
  - Know and understand the pathologies sought; o know and understand the basic of objective anomalies visualized.

MIT365:Emergency imaging internship

- **Emergency Imaging of Internship: 5 credits (75 hours); P, SPW**

The peculiarity of the x-ray unit of emergencies wishes to its vocation for the reception of emergencies. The objectives of the content are double:

1. **The objectives of Behavior**
   - Be able to manage the fluctuations of the home of emergencies;
   - Managing her stress faced with the problems of the trauma;
   - Adapt to situations personal medical the patient; - to cope with the requirements of the doctor.
2. **The objectives of technical capacity**
   - Carry out the reviews in a manner that it does not start later (delivery of as good quality as in a service of imaging);
   - Ensure a secure job and take account of the measures of radiation protection (pregnancy of the patient or of the mother);
   - Know the special implications of the emergency room (in trauma);
   - Know the gradations of procedures according to the state of the patient and the priorities to grant them.

MIT366:Professional Internship

- **Professional Internship: 5 credits (75 hours); P, SPW**

1. Arrival and integration in the establishment
2. Working in a company
3. The holding of the Intern journal
4. The choice of the theme of work: in collaboration with mentors professional academic and
5. Elaboration of the canvas of research
6. The resources to operate
7. The organization of work
8. Drafting of the report
9. Presentation of the report before a jury

MIT367: Professional Ethics &Deontology

Objective: At the end of the course, the student should be able to know those values and obligations which practice in the profession.

Content: Nurse, Patient, nurse/patient relationship, obligations of the nurse, rights of the patient, rights and responsibilities of the nurse, deontology, ethics, etiquettes, patient reception in hospital, nurse/patient-relative relationship. Medical jurisprudence, lab practice and the law, forensic nursing, malpractice, civic duties, organization of Government, Common law, labour law, Criminal Law,etc.

Health care Ethics

- Morality and Ethics: Norms, Deviances, Religion, Values, Beliefs, Cultures
- Bioethics
- MLS Ethics
- Moral Development
- Ethical Principles: Autonomy, Freedom, Privacy, Confidentiality, Beneficence, Fidelity, Motivation, Justice, Veracity and Responsibility.
- Code of Ethics health workers.
- Application of Ethics to MLS Practice: Respect For Life And Death, The Concept Of Dignity, Euthanasia, Human Rights, Rights of The Child, Rights of The Elderly, Patients Rights
- Ethical Decision Making Frameworks and their Application in diagnosis
- Context And Conflicts With Bioethical Standards

Patient Rights:

- Respect for life and death, the concept of dignity, euthanasia
- Care for dying patients: Palliative care, Confidentiality, Professional secrecy, Medical Research and Nursing care ethics.
- Code of ethics.
- Health Employee/employer contract law for health practitioners
- MLS and the law

Introduction to Law and Fundamental Rights Law

- Sources of law
- Law and enabling Acts (text of application)
- The concept of legal personality
- Civil responsibility (contract, TORT)
- Criminal responsibility
- The court and their jurisdictions
- Labor law: formation and execution of labor contract, remuneration, condition of work, obligation of the employer and employee, termination of labor contracts

Fundamental Rights

- The concepts of human rights
- Sources of human right
- Major international conventions of human rights
- International conventions relating to women
- Children and the rights of the minorities
- The role of the judiciary and the legislative in the protection of human rights
- The Cameroon national commission of human rights and liberties
- The civil society NGO's and the protection of human rights

Law for Medical laboratory personnel

- Definition of Law, public law, private law
- The client's and MLS personnel's' constitutional right
- Administrative law related to licensing and regulation of health practice

Field : MEDICAL AND BIOMEDICAL SCIENCES

Specialty :

PHARMACY TECHNOLOGY

Field: MEDICAL AND BIOMEDICAL SCIENCES

Specialty: Pharmacy Technology

1. The objective of the training

This three-year specialty aims to train highly qualified pharmacy technicians who are able to participate in the design, manufacture, administration and storage of drugs under the direction of a pharmacist and provide high quality holistic pharmaceutical care in various clinical, industrial and academic contexts at the local, national or international level.

2. Research Skills

→ **Generic skills**

- Be responsible and reflective;Be proactive and able to take the initiative;
- Have interpersonal skills;Have organizational skills;
- Have proven trust and confidence;Have critical ability and questioning;
- Develop deontological and professional ethical values;
- Make thoughtful decisions;Compromise and listening skills;
- Have a good profile (dress and appearance);
- Have critical thinking skills;
- Be able to maintain professional and moral standards.
- Master the computer tool and ICT

→ **Specific skills**

- Make supplies and deliveries of medicines;
- Read and interpret prescriptions accurately;
- Establish the validity of prescriptions;
- Demonstrate systematic distribution procedures;
- Evaluate the appropriateness of the prescribed drugs;
- Keep records in a convenient and efficient manner;
- Repackage and re-label appropriately distributed drugs;
- Evaluate signs, symptoms and history to distinguish manageable conditions in the practice of pharmacy;
- Select and advise on the use of pharmacological and non-pharmacological treatment strategies and options, including without treatment;
- Apply first aid measures if necessary;
- Precisely calculate quantities of ingredients necessary for the preparation of pharmaceutical products;
- Select and identify the ingredients for the preparation of the drug product;

- Apply the principles and techniques of formulation to the preparation of pharmaceutical products;
- Ensure all drugs and chemicals are packaged, labeled and stored to maximize stability and safety;
- Examine and evaluate the history of the consumer and prescription drugs;
- Apply the principales and techniques of formulation to the preparation of pharmaceutical products;
- Ensure that everything is in accordance with local workplace policy and professional conventions for product preparation;
- Prepare and maintain the appropriate product documentation;
- Apply the principles and techniques of sterilization and asepsis related to the preparation of pharmaceutical products.

3. Opportunities

- Pharmacy technicians; Pharmacist Assistant;
- Pharmacist of hospitals;Pharmaceutical supplier;
- Work in the pharmaceutical industry or in the drug supply chain;
- Pharmacovigilance;Cosmetic industry;

4. Organization of the Teachings

Semester 1

Field : Medical and Biomedical Sciences		Specialty: Pharmacy Technology					
CODE	Course Title	Hourly Volume					Number of credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
PHT111	Anatomy-Physiology I, Cell Biology, Histology and Embryology	45	20	5	5	75	5
PHT112	Microbiology I - Bacteriology - parasitology - Biochemistry	35	15	5	5	60	4
Professional Courses 60% (4 UC) 18 credits 270 hours							
PHT113	General Chemistry I and General Biochemistry I	18	7	2	3	30	2
PHT114	Sociology -Anthropology and Medical Psychology	35	15	5	5	60	4
PHT115	General Pharmacology/Introduction to nursing I: General concepts-History-Theories-Human Development	50	25	10	5	90	6
PHT116	Introductory Bloc Posting in a Hospital	/	/	20	70	90	6
Transversals Courses 10% (1 UC) 3 credits 45 hours							
PHT117	Bilingual Training and Functional Computer	30	10	3	2	45	3
Total		**220**	**90**	**90**	**50**	**450**	**30**

Semester 2

Field : Medical and Biomedical Sciences		Specialty: Pharmacy Technology					
Code	Course Title	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
PHT121	Anatomy and Physiology II	45	20	5	5	75	5
PHT122	Microbiology II (Virology - Mycology - Immunology)	35	15	5	5	60	4
Professional Courses 60% (4 UC) 18 credits 270 hours							
PHT123	General Biochemistry II and General Chemistry II	35	15	5	5	60	4
PHT124	Pharmaceutical Microbiologyand Pharmaceutical Microbiology Practice	45	20	5	5	75	5
PHT125	Nursing Care I	5	30	5	5	45	3
PHT126	Hospital Internship II	/	/	20	70	90	6
Transversals Courses 10% (1 UC) 3 credits 45 hours							
PHT127	French medical - medical English - ICT II	30	10	3	2	45	3
Total		**205**	**80**	**135**	**30**	**450**	**30**

Semester 3

Field : Medical and Biomedical Sciences		Specialty: Pharmacy Technology					
Code	courses titles	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
PHT231	Physical Chemistry I, Organic Chemistry I	60	10	/	5	75	5
PHT232	Physical Chemistry I: Practice, Organic Chemistry I: Practice	/	20	35	5	60	4
Professional Courses 60% (4 UC) 18 credits 270 hours							
PHT233	Pharmaceutical I and Pharmacognosy I; Pharmaceutical I and Pharmacognosy I: Practice	45	20	5	5	75	5
PHT234	Clinical Pharmacology I Clinical Pharmacology I: Practice	40	10	5	5	60	4
PHT235	Pharmaceutical Chemistry I, Pharmaceutical Chemistry I: Practice	45	15	10	5	75	5
PHT236	Clinical Internship & Report(hospitals/drug stores/quality control)	/	/	50	10	60	4
Transversals Courses 10% (1 UC) 3 credits 45 hours							
PHT237	ICT III, Introduction to Operational Research	30	10	0	5	45	3
Total		**195**	**90**	**135**	**30**	**450**	**30**

Semester 4

Field : MEDICAL AND BIOMEDICAL SCIENCES		Specialty: Pharmacy Technology					
Code	Courses Titles	Hourly Volume					Number of credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
PHT241	Pharmaceutical Analysis I, Pharmaceutical Analysis I: Practice, Organic Chemistry II	40	20	10	5	75	5
PHT242	Epidemiology, prophylaxis and Vaccinations	30	15	10	5	60	4
Professional Courses60% (4 UC) 18 credits 270 hours							
PHT243	Pharmaceutical II and Pharmacognosy II	30	15	10	5	60	4
PHT244	Pharmaceutical II and Pharmacognosy II: Practice	40	20	10	5	75	5
PHT245	Clinical pharmacology II, Clinical pharmacology II: Practice	40	20	10	5	75	5
PHT246	Community/Hospital Pharmacy Practice	/	/	60	/	60	4
Transversals Courses 10% (1 UC) 3 credits 45 hours							
PHT247	Biomedical Statistics and Information, Education and Communication	30	5	5	5	45	3
Total		**160**	**65**	**200**	**25**	**450**	**30**

Semester 5

Field : Medical and Biomedical Sciences		Specialty: Pharmacy Technology					
Code	Courses titles	Hourly Volume					Number of credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
PHT351	Analytical Chemistry and Clinical Hematology	30	15	40	5	90	6
PHT352	Health Information System and Health Economics	25	10	5	5	45	3
Professional Courses60% (4 UC) 18 credits 270 hours							
PHT353	Pharmaceutical III and Pharmacognosy III, Pharmaceutical III and Pharmacognosy III: Practice	40	15	30	5	90	6
PHT354	Clinical pharmacology III, Clinical Pharmacology III: Practice	25	5	10	5	45	3
PHT355	Pharmaceutical Chemistry III and Pharmaceutical Chemistry Practice	25	5	10	5	45	3
PHT356	Clinical Internship & Research Project Evaluation	/	/	70	20	90	6
Transversals Courses 10% (1 UC) 3 credits 45 hours							
PHT357	Medical Law , Occupational Medicine, Civic education and Ethics	20	15	5	5	45	3
Total		**180**	**80**	**160**	**30**	**450**	**30**

Semester 6

Field : Medical and Biomedical Sciences		Specialty: Pharmacy Technology					
Code	Courses titles	Hourly Volume					Number of credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
PHT361	Pharmaceutical Biotechnology, Pharmaceutical Legislation	40	20	15	5	90	6
PHT362	Community Healthand Hygiene Sanitation	20	15	5	5	45	3
Professional Courses60% (4 UC) 18 credits 270 hours							
PHT363	Pharmaceutical IV and Pharmacognosy IV, Pharmaceutical IV and Pharmacognosy IV: Practice	40	20	28	2	90	6
PHT364	Clinical Pharmacology IV, Clinical Pharmacology IV: Practice	29	9	5	2	45	3
PHT365	Pharmaceutical Chemistry IV	29	9	5	2	45	3
PHT366	Hospital Internship VI	/	/	70	20	90	6
Transversals Courses 10% (1 UC) 3 credits 45 hours							
PHT367	Professional ethics and deontology	29	14	/	2	45	3
Total		**165**	**70**	**175**	**40**	**450**	**30**

5. Course content

PHT111: Anatomy-Physiology I, Cell Biology, Histology and Embryology

- **Cell Biology - Histology: 1 credit (15 hours); L, T, SPW**

1. **Cell Biology and Histology**
   - The cell:
     - Structure;
     - Multiplication;
     - Physiology;
   - The tissue:
     - Epithelial tissue;
     - Connective tissue;
     - Nervous tissue;
     - Concept of genetics.

- **Anatomy - Physiology I: 4 appropriations (60 hours); L, T, SPW**

1. Nervous System
- Histology of the central and peripheral nervous system;
- Physiology of the central and peripheral nervous system: nervous influx, transmission of the influx (chemical mediators, synapse, driving plate), arc reflex;
- Organization of the central nervous system and functional localization: spinal cord, and medulla oblongata, brain, meninges and CSF;
- System Device nervous, cranial nerves, plexus;
- Neuro-vegetative system: sympathetic and parasympathetic.

2. The Endocrine System
- Endocrine pancreas;
- Thyroid: anatomy - Histology - physiology;
- Parathyroids: anatomy physiology, metabolism of calcium;
- Adrenals: Histology Anatomy, Physiology.
- System hypothalamo-pituitary;
- The stimulines.

3. Organ of meaning
- The eye : the view;
- The ear: hearing and balance;
- Smell: Taste;
- Touch.

4. System Musculoskeletal
- Ceos;
- The osteites;
- The osteomyelitis.

5. Digestive System
- General topography;

- Organization of the Nervous System
- Cells of the Nervous System
- Membrane potentials
- Propagation of an action potential
- Transmission of an impulse from cell to cell
- Integrating impulse transmission
- Chemical nature of neurotransmitters.

The Central Nervous System

- Telencephalon (Cerebral Cortex)
- Diencephalon
- Mesencephalon
- Myelencephalon
- Ventricles and meninges of the Central Nervous System
- Spinal cord

The Periphral Nervous System

- Cranial nerves
- Spinal nerves.

PHT112:Microbiology I - Bacteriology - Parasitology -

Objective: On successful completion of this course, student will be able to:

- Know the different associations of parasites with the human
- Know various characteristics and transmission techniques of parasites
- Learn basic techniques used to identify parasites
- Study the life cycles of some common parasites.

Content:

- **Microbiology - Bacteriology: 1 credit (15 hours); L, T, SPW**
  - **Introduction to the Bacteriology**
  - Place in the living world and ecological role of micro-organisms (saprophytes, commensalism, symbiosis and pathogens).
  - **General Bacteriology**
  - Structure of the bacterial cell, nutrition and growth, metabolism (anaerobic, aerobic conditions, fermentation), reproduction and genetics (genetic transfer, mutation), pathogenicity (notions of virulence, toxin).
  - **Bacterial Ecology**
  - Role of the field, reference mechanism of the host against the infection (Immunosuppression, opportunistic bacteria, nosocomial infections).
  - **Presentation of the bacterialsystematic**
  - **Study of the main species or bacterial groups pathogenic for man or likely to be**
  - Staphylococci, Streptococci, pneumococci, gonococcus, (history, habitat and epidemiology, fill pathogen, Bacteriological characters, diagnosis, treatment and prophylaxis).

- **Bacteriological techniques**

- Basic Techniques (microscopic examinations, insulation and identification), different types of levy in Clinical Bacteriology (technical and transport), methods of sterilization and preparation of media of cultures.
  - **Procedures for the sending of samples and of bacterial strains**
  - **Techniques of conventional identifications (1st part).**

➢ **Parasitology: 1 credit (15 hours); L, T, SPW**

1. Systematic study of human parasites, few definitions and concepts prior, mode of parasitism
2. Location of parasites
3. Epidemiology and evolutionary cycle
4. Parasitic disease: clinical description, pathology, defense of the body;
5. Prophylaxis (general and individual)

PHT113: General Chemistry Iand General Biochemistry I

➢ **General Biochemistry: 1 credit (15 hours); L, T, SPW**

Objective: This course is designed to give a basic understanding of the Biomolecules that make up the living cell. It is limited at this level on the structural presentation of Biomolecules their properties and how some of the Biomolecules are applied in Chemical reactions that occur within the body.

Content:

1. Generality : enzyme, vitamin, a hormone
2. Basic concept of clinical biochemistry General: definition of a metering and exploration
3. Learning of normal and abnormal physiology of carbohydrates, lipids, proteinsPhysiological study of different biochemical parameters of medical interest: techniques of biochemical assay and interpretation, normal values of biochemical constituents in biological fluids and pathological variations (1st part)

➢ **General Chemistry: 1 credit (15 hours); L, T, SPW**

1. Mixture and pure body
2. The major processes of immediate analysis
3. Simple body-to-body composed
4. Constitution of the material:atoms, molecules and ions
5. Chemical notation, symbol, Valencia, formula
6. The fundamental laws of Combinations: chemical equation, acids, bases, salts, concept of PH, equivalent, nomenclature, redox, degree of oxidation, catalysis.

PHT114: Sociology -Anthropology and Medical Psychology

→ **Sociology - Anthropology and Psychology : 6 credits (90 hours); L, T, SPW**

1. **Sociology - Anthropology**
   - Introduction to the Sociology ;
   - Concept of anthropology and ethnology;
   - Evolution of life and of man in its dimensions biological, psychological and social assistance;
   - Culture and cultural PWnomena,
   - The innate, the acquis, myths and beliefs;
   - Cultural attitudes to health, disease, death;
   - Medical practices of yesterday, today alternatives and traditional medicine;
   - Notions of group; social groups (family, working group, institution);
   - Dynamics of small groups;
   - Dynamics of Conflict (leaders);
   - Communication and communication networks.
2. **Psychology**
3. **Introduction to Psychology**
   - The major stages of life;
   - Emotional development, intellectual, psychomotor and psychosocial of the individual;
   - First Age, second age, age pre-school, school, adolescence, adulthood, aging;
4. **The Body: Body schema and body image**
5. **The Personality**
   - Dynamic aspect of the personality;
   - The unconscious;
   - Pulsion, refoulement;
   - Motivation.
6. **Mechanism of defense and of adaptation**
   - Affective states : feeling - emotion - fear - anger - Distrust - a concern - Lines and behavior - the different modes of relationship;
   - Social: educative - cooperative - of authority - of dependency - of acceptance - of mothering;
   - The relationship between careers - Treated: specificities.

PHT115:General Pharmacology/Introduction to nursing I: General concepts-History-Theories-Human Development

→ **General Pharmacology: 4 credit (60 hours); L, T, SP**

Objective

Content:

1. Definitions
2. Origin of drugs: Study of drug forms

3. Drug prescription: Writing and interpretation of prescriptions
4. Measuring instruments and dosage
5. Drug administration routes
6. Pharmaco-dynamics and Pharmaco-kinetic elements: :Liberation, absorption, elimination, metabolism, interactions and side effects
7. Drug regulation and distribution conditions
8. Storage and monitoring
9. Arrangement of drug cupboards
10. Recognition of some common drugs
11. Drug poisoning

- **Introduction to nursing I: General concepts-History-Theories-Human Development**

PHT116: Introductory Bloc Posting in a Hospital

Objective:

Content:

1. Admissions and discharge
2. Reception
3. Vital signs
4. History taking
5. Identification of basic equipment in the different departments
6. Laboratory

PHT117: Bilingual Training and Functional Computer

- **Bilingual training 1: 1 credit (15 hours); L, T, P, SPW**

French expression

1. **Form of words in French**
   - Prefix,
   - Radical;
   - Root, suffix.
2. **Explanation of words and group of words**
3. **Morphosyntax and rhetoric**
   - Components and structure of the sentence:
     - Simple sentence;
     - Complex sentence;
     - Composed sentence.
   - Figures of style:
     - Figures of analogy;
     - Figures of amplification;
     - Figures of opposition;
     - Figures of mitigation.

4. Administrative and professional correspondence

- The different parts of a administrative correspondence and the administrative style;
- Professional Correspondence:
    - Note of service;
    - Record (activity, mission);
    - The report (activity, mission).

5. Professional correspondence to individual dominance

- Application for employment;
- CV;
- Letter of motivation.

6. Methodological Considerations on the written exercises

- French composition;
- Contraction of text:
- French composition: Reminder methodological and implementation;
- Contraction of text: methodological reminder and application.

7. Study of the communication situations.

- Identification of the factors in the situation of communication (transmitter, receiver, code, channel, message, context);
- Situation of communication and verbal interactions;
- Study of the elements para verbal cues (kinesthetic, proxemics, MIMO-gestural, etc.;
- Identification and handling of figures of expression and thought metaphors, irony. Satire, parody, etc.); □ etc.

9. **Oral communication**

- **English Expression:**

Introduction - Course Content - Syllabus - Importance of English - Style in Business Writing - punctuation; capitalization - abbreviations.
The shares of Speech - Verbs - Question Words - Methodology: - of asking and answering questions
Economic Activities - Sectors of activity - Commerce and Trade Channels of distribution - Essay writing -specialized shops - active voice and passive voice - direct and indirect speech.

- **Techniques of Information and the communication I: 1 credit (15 hours); L, T, P, SPW**

1. Concepts and architecture of computers
2. Definitions: computing, information, computer, data, program, software, drivers
3. System of enumeration of base 2, the unit of measure of the information and its multiple

4. Components of the computer (hardware and software)
5. Study of an operating system
6. The devices (printers, scanner, …)
7. Study of a text treatment software: Microsoft Word
8. Study of a spreadsheet/Microsoft Excel
9. Study of a presentation software: Microsoft PowerPoint

PHT121: Anatomy and Physiology II

Objective: Among the basic sciences of medicine fundamental to the practice of all branches, the most important are anatomy and physiology. Their studies have unique applications to all branches of medicine and extracts pertinent to all branches are higHCMighted.

- **Cardiovascular System: 1 credit (15 hours); L, T, SPW**

1. **The Heart**
   - Anatomy: configuring external and internal structure, histology of the heart muscle;
   - Physiology: automatism, revolution, noises of the heart, the electrocardiogram.
2. **The vessels**
   - Anatomy: arteries, veins: their structure, Anatomy of the large and the small circulation;
   - Circulatory physiology: blood pressure, venous circulation and capillary.
3. **The blood**
   - The plasma and dissolved substances, figurative elements, hematopoiesis, haemolysis;
   - Coagulation;
   - Blood group.
4. **The reticulo-endothelialsystem**
   - Rate, lymphatic, thymus.7

- **Respiratory system: 1 credit (15 hours); L, T, SPW**

1. **Anatomy**
   - Upper airway (anatomy endoscopy and non-surgical), nasal cavity, pharynx, larynx, trachea;
   - Bronchus, lungs, pleura, anatomy and histology.
2. **Physiology of Breathing - Mechanisms for regulating nervous; -** chemical phenomena.

- **Digestive system: 1 credit (15 hours); L, T, SPW**

1. General topography; the peritoneum
2. The main categories of food:

- Energy Needs;
- Animal heat.

- **Genito-urinary system (woman-man): 2 credits (30 hours); L, T, SPW**

1. Structure and Physiology of the following organs: the kidney, the ureters, the urethra and bladder
2. ExcretoryRole of the skin
3. Description anatomy and physiology of the genitalia of the Man and the woman.

PHT 122: Microbiology II (Virology - Mycology - Immunology)

- **Microbiology II (Virology - Mycology - Immunology): 4 appropriations (60 hours);L, T, SPW**

Objective: This course is designed to give a basic understanding of bacteria. Upon successful completion of the course, the student should be able to:

- Have a general notion of bacteria
- Know the useful and harmful effects of microbes to the human
- Know the interaction of host and bacteria that lead to infection
- Preliminarily identify and learn the basic techniques of culturing bacteria

Content:

1. Characterization and classification of viruses and fungi
2. Infection, pathogenicity, virulence, exotoxicines and endotoxicines
3. Immune system: components, mode of action in the face of the antigen, active immunity, passive immunity, allergy

PHT123: General Biochemistry II and General Chemistry II

- **General Biochemistry II**

Content:

1. Nucleotides and Nucleic acids: General notion, structure and function
2. Enzymes, properties, classification, characteristics, mode of action
3. Vitamins: Characteristics and classification
4. Hormones: Classification
5. Mineral elements: Notion of Major and Minor elements
6. Metabolism: Definition, importance, type

- **General Chemistry II**

Content:

1. Organic Chemistry
2. Introduction to Carbon Chemistry
3. Alkanes, alkenes, alkynes, benzene, halogens, alcohols and PWnols
4. Carboxylic acids and esters

PHT124: Pharmaceutical Microbiology and Pharmaceutical Microbiology Practice

- **Pharmaceutical Microbiology 4**

Objectives: This course is designed to give at students a general knowledge of microbiology in relation to Pharmaceutical sciences and knowledge of the role of microbes in pharmaceutical production, brewery and food industry.

Content:

TU1: Introduction to the scope of Pharmaceutical Microbiology.

TU2: Classification of various types of microbes

TU3: Microbial contamination in a pharmaceutical industry (small and large scale production), the air, equipments, humans, raw materials etc.

TU4: Microbial Control methods (Disinfection and Sterilization)

- Disinfection, factors influencing disinfectants, dynamics of disinfection disinfectants and antiseptics their evaluation, etc
- Sterilization, different methods, validation of sterilization methods & equipments,.etc
- MicrobialQuality control methods (raw materials, finished goods, etc
- Sterility testing as per B.P

TU5: Microbial identification methods (growth media, Staining, biochemical tests and techniques)

TU6: Microbes as sources of drugs **(**antibiotics, vaccins, microbes in biotechnology etc)

TU7: Microbes in Food and Brewery industries

TU8: Microbial assays of antibiotics

TU9: Microbial spoilage and preservation of Pharmaceutical products:

Types of spoilage, factors affecting the microbial spoilage of pharmaceutical products, assessment of microbial contamination and spoilage, preservation of pharmaceutical products, evaluation of microbial stability of formulations.

TU10: Microbiological standardization of raw materials.

- **Pharmaceutical Microbiology Practical**

Exercises illustrating the course contents of theory including:

PU1: Introduction To different laboratory equipments, processes, techniques, etc

PU2: Disinfection: preparation of disinfectants/antiseptics for various purposes

PU3: sterilization methods (aseptic procedures, dry heat, moist heat,**)**

PU4: Preparation of various types of culture media.

PU5: Demonstration on culture techniques

PU6: Culturing of aerobic and anaerobic microbes.

PU7: Isolation of pure culture of micro-organisms.

PU8: Sub culturing of microbes.

PU9: Identification and characterization of isolates (biochemical tests)

PU10: Staining methods: slide preparation, Grams and acid fast staining.
PU11: Sterility testing-different methods as per BP/USP
PU12: Microbial viable count in a pharmaceutical product and total count of bacteria
PU13: Thermal death time determination.

PHT125: Nursing Care I

- **Nursing Care I**

Techniques of care - Nursing - First Aid I: 3 credits (30 hours); L, T, P, SPW

- Need to Move (manipulation of the bed, mobilization of the patient in bed and out of bed, position of the latter, surveillance and treatment of bedsores)
- Need to eliminate (elimination digestive - establishment of the baNUS of bed, enemas, levies, care in case of diarrhea and constipation unto urinary disposals unto observation of the bladder drainage continuous, change of the bag collector or draining).
- Need for clothing (dressing and stripping of the patient with apparatus)
- Need to be clean (partial toilet or NUSk)
- Need to breathe (oxygen therapy or aerosoltherapy)
- Need to Feed (installation of the patient for the meal, help to power, observation of dehydration, nausea, vomiting)
- Methods of investigations (statement of the temperature, blood pressure and pulsations)
- Monitoring (a patient plastered, post-operative, under infusion, of operative wound). Monitoring and knowledge of the symptom of shock
- Administration of Drugs (per-os, intramuscular, subcutaneous insulin- and anti coagulants). Dilution of a drug in an infusion
- Taking of blood and blood glucose levels at the end of the Finger
- Dressing of a simple wound

PHT126: Hospital Internship

- **Hospital Internship**

PHT127: French medical - medical English - ICT II

- **Use of English and french**

Content:

1. Conversation in French and English as specific to health care
2. Translation of Medical Terms, prescriptions, technical and protocol forms, drug dispensation notices
3. Drafting of reports

4. Documentation research
5. Health structures, premises, equipment, professional categories.

- **French:**

1. Health structures, premises, equipment, professional categories
2. Hospitals
3. The Hardware
4. The staff
5. The Role
6. The pathologies
7. The drugs

- **English:**

1. Drafting of research topics
2. Dissertation on the professional articles
3. Interviews - Speech unto etc. ….

- **Information and CommunicationTechnologies: 1 credit (15 hours); L, T, SPW**

Technique of information and communication 2

1. Creation of a simple database with a spreadsheet (How to Give a name to a cell range)
2. Validation of Data in a range of cells on a spreadsheet
3. Creation of the statistical tables simple (modality, workforce, frequency) and automatic filling with functions such as NB, NB.If and NB.If.ENS, Average, Sum, if
4. Creation of graphics from statistical tables
5. Presentation and use of a statistical software (ex: Epi Info)
6. Creation of a questionnaire on EPI info or other
7. Data entry and analysis
8. Definition of the concepts of the computer network
9. Presentation of the types of media and networks
10. Presentation of Internet (Connection, research, download)
11. Networks withoutwires
12. Learning of a software application
13. Numbering system
14. Computer Security: Virus and antivirus

PHT231: Physical Chemistry I, Organic Chemistry I

- **Physical Chemistry I**

Objectives:

Content:

- Behaviour of gases

TU1: Kinetic theory of gases, deviation from ideal behaviour and explanation.

- The liquid state

TU2: Physical properties (surface tension, parachor, viscosity, rheochor, refractive index, optical rotation, dipole moment) and chemical constituents.

- Amorphous and crystalline solids

TU3: Geometry & symmetry of crystals, Millers indices, types of crystals, Physical properties of crystals, crystal diffraction.

- Thermodynamics:

TU4: Fundamentals, first, second, third and zeroth law, Joule-Thompson's effect, absolute temperature scale.

- Thermo chemistry

TU5: Definition & conventions, heat of reaction, heat of formation, heat of solution, heat of neutralization, heat of combustion, Hess law of constant summation, Bomb calorimeter, bond energies, Kirchhoff's equation.

- Solutions

TU6: Ideal and real solutions, solutions of gases in liquids, colligative properties. PH: determination of PH buffers, theory of buffers.

TU7: Adsorption: Freurdlich and Gibbs adsorption Isotherms, Langmuir theory of adsorption.

- Electro chemistry

TU8: Faraday's laws of Electrolysis, Electric conductance & its measurement, molar & equivalent conductivity and its variation with dilution. KoHCMrausch law, Arrhenius theory, degree of ionization & Ostwald dilution law. Transport number & migration of ion, Hittorfs theoretical device, theory of strong electrolytes (Debye Huckle theory).

- Chemical kinetics

TU9: Zero, first and second order reaction, complex reactions, elementary idea of reaction kinetics, characteristics of homogenous and heterogeneous catalysis, acid base and enzyme catalysis.

- Phase equilibria

TU10: Phase, component, degree of freedom, phase rule (excluding derivation).

TU11: Cooling curves & Phase diagrams for one & two component system involving eutectics, congruent & incongruent melting point (examples-water, sulphur, KI-H2O, NaCl-H2O system).

TU12: Distribution law & application to solvent extraction.

- **Organic Chemistry I**

Objectives: On successful completion of this course, student will be able to:

- Identify functional groups of organic molecules and recognize the occurrence of isomerism
- Distinguish between ionic and covalent compounds and describe the shapes of simple covalent molecules
- Classify organic and inorganic reaction types

- Understand separation methods for simple mixtures
- Predict changes in reactions at equilibrium
- Understand the uses of ultraviolet/visible spectroscopy

Content:

- **Basic Principles and Concepts of Organic Chemistry**

TU1: Structure and Properties : Atomic Structure, atomic orbital, molecular orbital, hybridization, sigma & Pi bond, covalent, electrovalent and co-ordinate bond, inductive effect, resonance, Polarity of bonds and molecules, dipole moment, resonance, inductive and electrometric effects, intra-molecular and intermolecular hydrogen bonding, acids and bases.

- **Classification & Nomenclature of organic compounds.**

TU2: Isomerism, geometrical isomerism, Stereochemistry including optical activity, stereoisomerism, specification of configuration and conformational analysis.

TU3: Important methods of preparation, reactions with special reference to mechanism of the following classes of compounds: Alkanes, alkenes, alkynes & dienes, free radical substitution reaction, alkyl halides, Alcohols.

- **Aromatic Compounds**

TU4: Structure and resonance of benzene, aromatic character, mechanism of electrophilic aromatic substitution, orientation effects in electrophilic substitution, nucleophilic aromatic substitution.

Resonance, orientation of aromatic substitution, arenes, amines (aliphatic & aromatic), PWnols, aryl halides.

- **Stereochemistry**

TU5: Stereoisomerism, optical activity, enantiomers, Diasteriomerism, mesostructures, specification of R and S, D and L configuration, racemic modification and resolution of recemic mixtures, conformational analysis, geometrical isomerism, it's nature of formation, nomenclature of isomers and determination of configuration.

TU6: Preparation, properties and actions of PWnols, sulphonic acids and derivatives, carboxylic acids, nitro compounds, amines, diazonium salts, aryl halides and ketones.

TU7: Poly nuclear aromatic hydrocarbons, Naphthalene, phenathrene and anthracene.

TU8: Heterocyclic compounds: Study of fundamentals of heterocyclics, nomenclature, methods of synthesis and important chemical reactions of the following:

- Five -membered heterocycles: Furan, thioPWne, pyrrole, thiazole, oxazole, imidazole, pyrazole, triazole and tetrazole.
- Six-membered heterocycles: Pyridine, pyridazine, pyrimidine, pyrazine and pyrones.
- Benz-fused heterocycles: Quinoline, isoquinoline, indole, acridines and xathone.
- Modern concepts of rational drug design: a brief introduction.

PHT232: Physical Chemistry I: Practice, Organic Chemistry I: Practice

- **Practical Physical Chemistry**

The practical aspect of this course shall include experiments on

PU1: Acid – base reactions – pH determinations, preparation of buffers etc.
PU2: Energy effects in chemical reactions.
PU3: Rates of chemical reactions.
PU4: Chemical equilibrium – reversible reactions.
PU5: Electrical conductivity of solutions.
PU6: Determination of melting points and boiling points.
PU7: Synthesis of Aspirin and other pharmaceutical bioactive substances.

- **Practical Organic Chemistry**

PU1: Introduction to Organic Chemistry laboratory techniques. Experiments in simple qualitative analysis.
PU2: Nitration: Preparation of Nitrobenzene from Benzene.
PU3: Halogenation: Preparation of p-Bromo acetanilide from Acetanilide.
PU 4: Oxidation: Preparation of Benzoic acid from toluene or BenzylcHCMoride
PU5: Reduction: Preparation of m-Nitroaniline from m-Dinitro Benzene.
PU6: Etherification: Preparation of n-Butyl acetate from n-Butyl alchol.
PU7: Acetylation: Preparation of Acetanilide from Aniline.
PU8: Etherification: Preparation of β-Naphthyl methyl ether from β-Napthol.
PU9: Hydrolysis (Saponification): Preparation of Benzoic Acid from Methyl Benzoate
PU10: Preparation of Benzoic acid from Benzamide.

PHT233: Pharmaceutical I and Pharmacognosy I

- **Pharmaceutical I**

Objective: This course is designed to:

- Enhance students' knowledge and skills in basic pharmaceutical calculations
- Introduce the students to the principles of drug dispensing
- Introduce the students to the basic pharmaceutical operations.

Content

TU1: Introduction to pharmaceutics and Historical background Metrology
TU2: Imperial, metric and S.I., weights and measures, interconversion
TU3: Introduction to Dosage forms Classification of solids, semisolids and liquid dosage forms, conventional and novel delivery systems.
TU4: Pharmaceutical Additives Acids, bases, buffers, antioxidants, water etc.
TU5: Pharmaceutically acceptable glass.
TU6: Diluents, vehicles, bases, solvents, organoleptic additives, surfactants, polymers and their applications.

TU7: Size reduction and Size Separation ; Definitions, principles of size reduction, objectives of size reduction, factors affecting size reduction; principles, laws and factors affecting energy requirements, different methods of size reduction, study of hammer mill, fluid energy mill and disintegrator. Various methods and equipments employed for size separation e. g., sieving, sedimentation, centrifugal elutriation, microscopic methods.

Mixing and Homogenization

TU8: Theory of mixing: solid-solid, solid-liquid, liquid-liquid and semisolid mixing. Study of different types of mixers used in pharmaceuticals like planetary mixers, sigma mixers, turbo dispensers, double cone mixers, Colloid mill, Triple roller mill.

- **Clarification and Filtration**

TU9: Definitions, theory and factors affecting filtration, types of filter media, filter aids, and selection of filters. Equipments like gravity filter, pressure filter, vacuum filters, filter press, leaf filters, continuous rotary drum filter, edge filter, sand filter, membrane filters. Centrifugal type filters; batch, semi continuous & continuous type.

- **Heat Processes**

TU10: Evaporation: Factors affecting evaporation, study of evaporating stills and evaporating pans, heat transferring evaporators, vapor compression evaporators and evaporation under reduced pressure.

- **Distillation**

TU11: Importance of distillation in Pharmacy, methods of distillation.

Brief introduction to freeze drying, sublimation, desiccation and exsiccation, efflorescence and its importance.

- **Extraction and Galenicals**

TU12: Extraction processes and study of percolation and maceration and their modifications, their applications in the preparation of tinctures and extracts.

- **Pharmaceutics I Practical**

PU1: Preparation of following classes of products involving the use of calculations in metrology (at least 2 products from each category wherever applicable): Aromatic waters, injections, solutions, spirits, glycerin, syrups, elixirs, lotions, mucilages and liniments, suppositories, tablets, powders and capsules.

PU2: Demonstration of equipments (working procedure) for

- Size Reduction and size separation, Mixing and homogenization, Clarification and filtration, Evaporation, Distillation and Percolation

- **Pharmacognosy I**

Objectives: After completing this chapter, the students should be able to;

- Describe the origin, chemistry, biosyNTDesis and pharmaceutical importance of various classes of natural products including alkaloids, carbohydrates, glycosides, acids, PWnolic compounds, fats and oils etc.

- Identify plants based on their macroscopical and microscopic characters.
- Identify the cell contents of plants
- Cultivate medicinal plants under appropriate conditions
- Collect, dry and preserve medicinal plant products.
- Prepare, extract and separate natural plant products.
- Differentiate between alkaloids, glycosides, fats & oils, terpenoids etc

Content:

TU1: **Introductory Pharmacognosy**: Historical development, modern concept and scope of Pharmacognosy. Outline Significance of Pharmacognosy in various systems of medicine.

Plant classification

Plant nomenclature and taxonomy

Vegetative anatomy of plants

TU2: Classification of crude drugs: Based on alphabetical, morphological, pharmacological, chemical and taxonomical methods, official and unofficial drugs, organized and unorganized drugs.

TU3: Definition of crude drug: Sources of crude drugs viz; Herbs, Animals, inorganic matter, plant tissue culture and marine sources as well as the role of herbal drugs in national economy.

TU4: Cultivation of herbal drugs: Factors influencing variability in drug activity, type of soils, fertilizers, plant hormones and their applications, polyploidy, mutation and hybridization in medicinal plants.

TU5: Production Factors: Factors involved in the preparation of herbal drugs for market from cultivated and wild sources including collection, drying, storage and transport methods.

TU6: Study of morphological and histological characters of crude drugs: Ergastic cell inclusions, anatomical structures of bark, fruits, seeds and monocot and dicot stems, leaves and roots.

TU7: Phytoconstituents of medicinal importance: Introduction, classification and chemical tests of: Carbohydrates, polysaccharides, mono-, di- and tri-terpenes, steroids, saponins, glycosides, flavonoids, PWnolic compounds, tannins, carotenoides, alkaloids, iridoides and amino acids.

TU8: Principles of plant classification: Diagnostic features and medicinal significance of important plants with special reference to:

- Algae: Rhodophyceae (Agar, Alginic acid, Diatoms, Carrageenan and Cetraria).
- Fungi: Eumycetes (Ergot, Yeast, Mushrooms, Antibiotics, and Lycopodium).
- Gymnosperm: Pinaceae (Turpentine, Colophony), Gnetaceae (EPWdra).
- Angiosperm: Apocynaceae, Asteraceae, Convolvulaceae, Lamiaceae, Rubiaceae, Rutaceae, Solanaceae, Scrophulariaceae, Apiaceae,

Leguminosae (Caesalpinaceae, Mimosaceae, Papilionaceae), Papaveraceae, AcaNTDaceae and Euphorbiaceae.
- Pteridophytes: Male fern.

TU9: Techniques in microscopy

- **Pharmacognosy I Practical**

PU1: Microscopic preparation. Staining and surface preparation.

PU2: Microscopical studies of basic tissues, bark, stem (Dicot, Monocot), Root (Dicot, Monocot), seed, leaf, fruits, trichomes, stomata, calcium oxalate crystals, starch, pHCMoem fibres.

PU3: General chemical tests for alkaloids, glycosides, tannins, resins and proteins.

PU4: Study of diagnostic characters of families mentioned in the theory.

PHT234: Clinical Pharmacology I, Clinical Pharmacology I: Practice

- **Clinical Pharmacology I**

Objectives: At the end of this unit, the students will know:
- The treatment of the various infective organisms.
- Drug resistance
- Spectrum of activity of each drug
- Side effects/contraindications and management of toxic effects of each class of drug.

Content:

TU1: Chemotherapy

General Principles of Chemotherapy, Sulfonamides, Cotrimoxazole, Quinolones, Antibiotics – Penicillins, Cephalosporins, CHCMoramPWnicol, Tetracyclines, Macrolides.

Chemotherapy of Parasitic infections, Tuberculosis, Leprosy, Malaria, Fungal infections, viral diseases, Introduction to Immunomodulators and Chemotherapy of Cancer.

TU2: Pharmacology of Endocrine System
- Hypothalamic & pituitary hormones, Thyroid hormones & Thyroid Drugs, Parathormone,Calcitonin & Vitamin D, Insulin, oral hypoglycemic agents & glucagon.
- ACTH & Corticosteroids, Androgens & anabolic steroids, Estrogens, Progesterone &Oral Contraceptives, Drugs acting on uterus.
- Principles of Toxicology

Definition of poison, general principles of treatment of poisoning with particular reference to barbiturates, opioids, organophosphorous & atropine poisoning, Heavy metal Anatagonists.

- **Clinical Pharmacology I Practicals**

PU1: Students will study generic and proprietary drugs available in the local hospital and community pharmacies used for the management of cancer as well as bacterial, fungal, viral, parasitic and protozoal infections. Emphasis will be laid on the dosage form, route of administration, indications, contraindications, side effects, interactions and also their generic and trade names.

PHT 235: Pharmaceutical Chemistry I, Pharmaceutical Chemistry I Practice

Objective: The course gives the student an understanding of:

- The molecular basis of the discovery, design, synthesis and mode of action of drugs;
- The physical and chemical properties of drugs in relation to drug action.
- Therapeutic uses of inorganic pharmaceuticals

Content

TU1: Introduction: Definitions, evolution and scope of Pharmaceutical Chemistry.

TU2: Drug discovery, Design, development, Principles of drug discovery, sources of drugs

TU3: Physiochemical properties of drugs and drug action

TU4: Basic Principles of Medicinal Chemistry: Optical, geometric and bioisosterism of drug molecules and biological action.

TU5: Stereochemistry and drug action

TU6: Drug-receptor interaction including transduction mechanism and drug receptor theories

TU7: Inorganic pharmaceuticals

- Major physiological ions, electrolytes used in replacement therapy, physiological acids-base balance, electrolytes used in acid-base therapy, electrolyte combination therapy.
- Essential and trace ions: Copper, zinc, iron, selenium, sulfur and iodine.
- Gastro-intestinal agents: Acidifying agents, antacids, protective and absorbents, saline cathartics.
- Topical agents: Antimicrobials and astringents.
- Dental products: Anti-caries agents and dentifrices.

Miscellaneous Inorganic Pharmaceutical agents: Inhalants; respiratory stimulants, expectorants and emetics, antidotes.

PHT236 :Clinical Internship & Report (Hospitals/Drug stores/Quality Control)

Broad Objectives:

Having successfully gone through three semesters of studies and eight weeks of clinical block posting on the general functioning of a community health institution, the students have acquired appreciable knowledge in some aspects of pharmacy management. Some of these aspects are;

- Drugs conservation,
- Interpretation of medical prescription,
- Drug repackaging and dispensing

Specific Objectives/ Content:

During this internship, students are expected to;

- Work practically on theoretical lessons in community/public hospitals by visiting various units in the hospital setting.
- Gain more practical exposure on the above spects in different clinical settings and pharmacies
- Build up team spirit.
- Proper drug dispensing
- Patient counseling
- The stock management cycle.

MIT237:Information and the communication technologiesIII,Introduction to research

- **Information and Communication Technologies III: 1 credit (10 hours); L, T, SPW**

1. Study of a spreadsheet/Microsoft Excel
2. Study of a presentation software: Microsoft PowerPoint
3. Study of a software for the creation and querying databases (Microsoft Access).

- **Initiation to research: 1 credit (10 hours); L, T, SPW**

1. Introduction to the search
2. Approach of the research: construction of a hypothesis, experimentation, validation, conclusion
3. Implementation of a research protocol
4. Bibliographical research
5. Ethics in Health Research
6. Critical reading of scientific articles
7. Drafting and scientific presentation

Construction of a Research proposal: **Background:** Literature review, formulating the problem statements, justification of studies, objectives, framing the questions according to general and specific objectives; is developing a testable hypothesis to achieve the objectives for quantitative research selection, referencing, etc.; Ethical considerations; Work plan: personnel; timetable project administration; Plans for dissemination.

Data collection and management: Design and Pretesting of measuring instruments (reliability and validity of instruments);training of interviewers; quality control of measurements; computerization, checking and validating, measurements; the issue of missing observations, statistical summarization of information; testing of hypothesis.

Analysis & presentation of Results; Report writing and format

PHT241: Pharmaceutical Analysis I, Pharmaceutical Analysis I: Practice, Organic Chemistry II

- **Pharmaceutical Analysis I,**
- **Pharmaceutical Analysis I: Practice,**
- **Organic Chemistry II**

PHT242: Epidemiology, Prophylaxis and Vaccinations

Objective:

Content:

TU1: Definition; Incidence, prevalence, morbidity, lethality, contagiousness, attack rate, warning threshold, primary and secondary warning.

TU2: Epidemiological tripod

TU3: Epidemics, endemo epidemics, pandemics, demographic notions.

TU4: Prophylaxis: Definition, prophylactic measures, systemic reporting, early screening, isololation, quarantine, rat extermination, desensitization, molluse control. Disposal of waste water and human and animal refuse.Physical, chemical, and radioactive pollution control; chemo-prophylaxis.

TU5: Immunization; Definition, classification, Expanded program on immunization: origin, target population; Immunization strategies; Management of immunization activities. Planning, organization, supervision, evaluation of immunization coverage; Procurement and storage of vaccines, Monitoring of immunized population and IEC, Cameroon vaccination schedule: New-born, pre-school age, adults.

PHT 243: Pharmaceutical II and Pharmacognosy II

- **Pharmaceutics II**

Objectives: This course is designed to:

- Enhance students' knowledge and skills in basic pharmaceutical calculations
- Introduce the students to the principles of drug dispensing
- Introduce the students to the basic pharmaceutical operations

Content:

TU1: Introduction to unit operation and pharmaceutical engineering. Concept and requirement, basic laws, materials and energy balances.

TU2: Conveying of Solids

Belt conveyors, chain conveyors, screw conveyors and pneumatic conveyors.

TU3: Pharmaceutical Plant Construction

Selection of materials for pharmaceutical plants, study of factors like physical, chemical, mechanical and economical.Suitability of different materials for different plants i.e. Ferrous metals -Cast iron, steel, stainless steel; Non-ferrous metals - copper and alloys, aluminum and alloys, lead, tin, silver, nickel and alloys, chromium, zinc;

Non-metals glass, stoneware, slate brick, concrete, asbestos, plastics, rubber, timber, ceramics and enamel.

Corrosion: Types, causes, theories and methods of prevention of corrosion.

TU4: Environmental Pollution and safety hazards

Mechanical, chemical, electrical fire and dust hazards, safety requirements; fire extinguishers; accident records.Environment control and effluent treatment.

TU5: Flow of fluids

Fluid static and dynamics, basic equations, laws of conservation in fluid flow.

Measurement of pressure: Manometers, Types of flow, Reynold's number and its significance; distribution of velocities in a pipe; friction losses; pipe fittings and joints.

Measurement of fluid flow: Principle, and construction of venturimeter, orifice meter, pitot tube, weirs, Rota meter, and positive displacement meter-current meter and disc meter.

Flow controls: Plug cock, globe valves, gate valves, and water hammer, unidirectional valves, automatic regulating valve.

Pumps: Reciprocating pumps, positive displacement pumps, rotary pumps - volute and centrifugal pumps.

Blowers-Compressors, evacuators

TU6: Heat transfer

Modes of heat transfer; heat transfer coefficient; OHTC.Convection- concept of film overall coefficient, evaluation of individual film coefficient. Radiation - Stefan Boltzmann law; heating media, equipments, lagging.

Fuels-solid, liquid, gases.Steam as heating medium-properties and uses of steam, steam traps, pressure reducing valve, steam heated heat exchanger, lagging, condensation, heating by electricity.

TU7: Distillation

Theory of distillation, vapor liquid equilibrium relationship, volatility and relative volatility, Azeotropic and zeotropic mixture, phase diagrams. Rectification and construction of columns; molecular distillation; steam distillation; eNTDalpy composition diagram and determination of number of theoretical plates; HEPH.

TU8: Refrigeration and Air Conditioning

Refrigeration: Theory of refrigeration, refrigeration current cycle and equipments employed for large-scale refrigeration.

Air conditioning: Theory of air conditioning, application and types, humidification and dehumidification, cooling towers.

Humidity: Determination methods, methods of increasing and decreasing humidity. Application of humidity control in pharmaceutical industries.

TU9: Drying

Theory of drying - principles, equilibrium moisture content, rate of drying; drying of dilute solutions and suspensions - drum dryer, spray dryer; drying of solids - convection type, tray dryer, tunnel dryer, rotary dryer, fluidized bed dryer, vacuum dryer, oven dryer, freeze dryer, radiant heat dryers. Automation in drying process.

TU10: Autoclave Process Control System

Process variables, temperature, pressure, flow, level and vacuum and their measurements. Elements of automatic process control systems. Elements of computer aided manufacturing (CAM).

TU11: Crystallization

Characterization of crystals and factors affecting them, suppersaturation theory and its limitations, nucleation mechanisms, crystal growth, study of various types of crystallizer, tanks, agitated batch, Swenson Walker, single vacuum, circulating magma and crystal crystallizer, cacking of crystals and its prevention.

- **Pharmacognosy II**

Objectives: The students will be required to know the various plant products, their composition and their pharmacological action

Content:

TU1: Biosynthesis: Formation of primary and secondary metabolites. Study of Calvin cycle, TCA cycle, Shikimic acid pathway, acetate hypothesis, isoprenoid pathway.BiosyNTDesis of carbohydrates, lipids and volatile oils.

TU2: Resins: Study of drugs containing Resins and Resin Combination like Podophyllum, Cannabis, Capsicum, Shellac, Asafoetida, Balsam of tolu, Balsam of peru, Benzoin, Turmeric, and Ginger.

TU3: Volatile oils : General methods of obtaining volatile oils from plants, Study of volatile oils from Mentha, Coriander, Cinnamon, Jatamansi, Cumin, Black pepper, Cassia, Lemon peel, Orange peel, Lemon grass, Citronella, Caraway, Dill, Spearmint, Clove, Fene Nutmeg, Eucalyptus, Chenopodium, Cardamom, Valerian, Musk, Palmarosa, Gaultheria.

TU4: Phytochemical constituents of medicinal plants : Introduction to active constituents of drugs : Their isolation, classification and properties with Qualitative chemical tests of the following – Alkaloids, Saponins, flavonoids, glycosides carbohydrates, fats and oil, terpenoids, acids, alcohols, Talc, Diatomite, Kaolin, Bentonite, Gelatin and Natural colors.

TU5: Herbarium: Preparation of herbarium sheets and their importance in authentication of plants.

TU6: Fibers: Study of fibers used in pharmacy such as cotton, silk, wool, nylon and glass

TU7: Tannins: Study of tannins & tannin containing drugs like Gambier (Pale Catechu), Black Catechu, Gall and Myrobalans. Utilization of aromatic plants & desired products with special reference to Peppermint oil, Lemon grass oil & Eucalyptus oil etc.Role of aromatic plants in national economy like in perfumery, cosmetics etc.

TU8: Drugs of Animal origins: Shellac, cochineal, cantherides, spermaceti, woolfat, lard, beeswax, honey, musk, lanolin, and gelatin.

TU9: Enzymes- Biological sources, preparation, characters and uses of Diastase, Papain Bromalain, Yeast, Pancreatin, Urokinase, Pepsin, Trypsin, Pencillinase, Hyaluronidase and Stryptokinase, etc.

TU10: Natural pesticides and Insecticides- Tobacco, Pyrethrum, Cevadilla, Neem, Ryania Introduction to herbicides, fungicides, fumigants and rodenticides.

PHT244: Pharmaceutical II and Pharmacognosy II: Practice

- **Pharmaceutics II Practical**

Objective:

Content:

Experiments based upon theoretical portion preferably on the following:

PU1: Effect of thickness of filter media, hydrostatic pressure, size of filter media etc. on filtration rate.

PU2: Rate of drying, equilibrium moisture content, determination of factors affecting rate of drying.

PU3: Comparison of single stage and multiple stage extraction in solid-liquid extraction.

PU4: Efficiency of a simple distillation unit and effect of insulating materials on the efficiency.

PU5: Determination of efficiency of a steam distillation unit.

PU6: Determination of hardness of water.

- **Pharmacognosy II Practical**

PU1: Morphology of mentha, Lemongrass, Nutmeg and chenopodium.

PU2: Morphology of Turmeric, Ginger, Euncalyptus.

PU3: Morphology and microscopy of Coriander and Cinnamon.

PU4: Morphology and microscopy of Clove and to study its transverse section.

PU5: Study of Cotton, Silk and Wool along with their chemical Tests.

PU6: To study the morphology and chemical tests of Talc, Diatomite, and Kaolin

PHT245: Clinical Pharmacology II, Clinical Pharmacology II: Practice

- **Clinical Pharmacology II**

Objective: At the end of this unit, the students will have knowledge on:

- The various drugs of the autonomic various system like cholinergic and anticholinergic drugs and their uses, adrenergic drugs and adrenergic blockers and their uses.
- The dose, side effects, drug interaction and management of toxicity of the drugs studied

Content:

TU1: **Pharmacology of Autonomic Nervous System**

- Cholinergic receptors, cholinergic drugs (parasympathomimetics, cholinomimetics, and anticholinesterases).

- Anticholinergic drugs.
- Adrenoceptors, sympathomimetics, adrenoceptors blockers.
- Drugs action on autonomic ganglia (ganglionic stimulants, ganglion blocking agents).
- Neuromuscular blocking agents and centrally acting muscle relaxants.

TU2: Autocoids

- Histamine, Antihistaminics.
- Serotonin, agonists and antagonists.
- Arachidonic acid metabolites.
- Renin Angiotensin Aldosterone System, Plasmakinins, VIP, neurotensin, substance P, PAF.

TU3: Drugs in Ocular Pharmacology

- Mydriatic and miotic agents and drugs used in glaucoma. Brief review of pathology

- **Clinical Pharmacology II Practical**

PU1: Students will study generic and proprietary drugs available in the local hospital and community pharmacies used for the management of the respective disease conditions. Emphasis will be laid on the dosage form, route of administration, indications, contraindications, side effects, interactions and also their generic and trade names.

PHT246: Community/Hospital Pharmacy Practice

- **Part I -Hospital Pharmacy**

TU1: Status of health delivery systems in Cameroon**.**

- Definition and role of hospitals in the health delivery systems.
- Types of hospitals.

TU2: Hospital Pharmacy

- Definition, functions and objectives of hospital pharmacy.
- Location, layout and flow chart of material and men, personnel and facilities required including equipments.

TU3: Drug distribution system in Hospitals

i) Out patients

ii) In patients: Detailed discussion of:

- Unit dose dispensing
- Floor ward stock system and satellite pharmacy services
- Central sterile services, bed side pharmacy
- Prepackaging.

TU4: Over the Counter (OTC) Drugs

- Its establishment, dispensing, personnel, space, equipment, apparatus and other facilities required to achieve safe, efficient and speedy dispensing of drugs.

TU5: Maintenance of records of issue and use of narcotics and dangerous drugs, ward stock medicines and emergency drugs.

TU6: Medical Stores Objectives, layout facilities; procedures for procurement of drugs and supplies from medical stores depot, manufacturer, distributor, local market, procedure and limits of emergency purchase.

TU7: Pharmacy Therapeutics Committee.

- Constitution and functions of Pharmacy therapeutics committee.
- Hospital formulary system and its organization, functions and composition.

TU8: Drug Information service and drug information bulletin

TU9: Manufacturing of pharmaceuticals in hospitals

- Sterile Manufacturing: Large and small volume parenterals, facilities, requirements, layout, production planning, manpower requirements.
- Non-sterile manufacture: Liquid orals, external bulk concentrates.

TU10: Surgical instruments, hospital equipments and health accessories: Nomenclature and uses.

- **Part II- Clinical Pharmacy**

TU11: Introduction to clinical pharmacy practice

- Definition and scope, common daily terminology used in the practice of medicine, functioning and working of clinical pharmacy unit, manpower requirements.

TU12: Pharmacists and patient counseling including specific examples

TU13: Drug interactions of clinical important drugs

- Introduction and Definitions
- Mechanism of drug interactions, Drug - Drug Interactions with reference to Analgesics, Diuretics, Cardiovascular drugs, Gastrointestinal agents, Vitamins and Hypoglycemic drugs.

TU14: Compliance to treatment and role of pharmacist

- mpact of diseases on drug action

TU15: Drugs in clinical toxicity.

- General treatment of poisoning,
- Systemic antidotes.
- Treatment of poisoning due to insecticides,
- Heavy metals, narcotics, barbiturates
- Organophosphorous compounds

TU16: Pharmaco –economics.

PHT247: Biomedical Statistics, and Information, Education and Communication

- **Biomedical Statistics**

Objective: To summarize, analyze, present and interpret health statistical information.
Content:

- Variables (Qualitative and quantitative)
- Presentation of data: bar charts, pie diagrams, histograms and tables, frequency and frequency distribution
- Summarization of quantitative and qualitative data: mean, median and mode, standard deviations and standard errors, proportions etc
- The concept and principles of significance tests and confidence intervals
- Sampling
- Statistical testing and inference: The normal distribution and t-distribution, Chi squared test, Poison distribution, non-parametric tests etc.
- Errors in statistics

➢ **Information, Education and Communication**

Definition of terms.

- Goals, objectives, priorities, basic principles, levels of intervention.
- Methods: classification, choice criteria, evaluation of population knowledge, aptitude, attitude vis-à-vis health.
- New approaches and community involvement.
- Analysis of a community health situation: problems and resources.
- Formulation of educational objectives: choice of strategies, methods and means.
- Drawing up of evaluation protocol.

PHT351: Analytical Chemistry and Clinical Hematology

Objective: This course is designed to give the student a background on analytical methods used in pharmaceutical manufacturing and quality assurance of drugs.

Content:

1- Analytical Chemistry

TU1: Principles and methods of analysis

- Significance of qualitative analysis in quality control
- Techniques of analysis
- Types of error, precision and accuracy

TU2 : Gravimetric Analysis

- Precipitation techniques
- Solubility product
- Colloidal states
- Suppersaturation
- Coprecipitation, filtration papers, thermogravimetric curves

TU3 : Titrimetric Analysis

- Fundamentals of volumetric analysis
- Methods of Concentration expression
- Acid – base or Neutralization titrations

- Redox, Iodometric, precipitation, complexometric, potentiometric titrations.

TU4 : Separation Techniques

i) Bulk separation eg filtration.

- Temperature dependent effects (distillation, evaporation, and drying)
- Solubility effects (solvent extraction, crystallization and precipitation)
- Ion exchange (dialysis and lyophilization)
- Instrumental Separations
- Chromatographic Techniques e.g GC, HPLC, TLC etc
- Spectroscopic methods

- **Pratical Training**

PU1: Introduction to analytical tools, calibration of instruments
PU2: Standardization experiments
PU3: Titrimetric analyses
PU4: Experiments based on gravimetric analysis
PU5: Experiments on complexometric, redox titrations
PU6: Non-aqueous titrations using percHCMoric acid
PU7: Experiments on drug syntheses and purity determinations

2- Clinical Hematology

Objective:

- To familiarize students with basic notions of hematology and blood banking
- To enable students know the hematological reactions to drugs
- To enable students understand the side effects of blood transfusion and how to minimize these effects.

Content:

TU1: General notions of blood function and composition

TU2: Theoretical and practical aspects of laboratory diagnosis of primary and secondary disorders of blood and blood forming organs including anaemia, leukaemia and coagulation serum defects.

TU3: Haematologic reactions to drugs
TU4: Drug-induced hemolysis, immune haemolysis
TU5: Reactions primarily affecting granulocytes
TU6: Drug-induced thrombocytopenia
TU7: Other hypersensitivity reactions

- Lymphadenopathy and atypical lymphocytes
- Marked esinophilia

TU8: Physiology of haematopoiesis
TU9: Analysis of various blood parameters
TU10: Blood as a drug
TU11: Blood grouping and blood transformation.
TU12: Blood coagulation factors

TU13: Cameroon blood policy
TU14: The role of the laboratory in anticoagulant therapy.

PHT352: Health Information Systems and Health Economics

- **Health Information Systems**

Objective: The main objective of this course is to enable the student to be able to Collect, summarize, analyze and present health information from an individual patient and community, in a manner that it can be useful in taking important decisions on individual patients and on the community and the health system.

Content:

TU1: Definition and goals.
TU2: Statistical elements: units, populations, samples.
TU3: Statistical sources; statistical calculations.
TU4: The Health Information Process.
TU5: Data collection, collection media, forwarding, treatment.
TU6: Analysis and interpretation; feedback and decision taking.
TU7: Computerization of Health information
TU8: Role of health information in health care management.

- **Health Economics**

Objective: The main objective is to enable students appreciate the economic dimensions involved in the provision of efficient health care in a manner that it will be effective, equitable, affordable and sustainable, to a vast majority of the population at the same time minimizing all the available resources, especially when these resources Are often limited and are in high competition with other aspects of social life.

Content:

1. **Basic concepts in health economics:**
   - The offer;
   - The request;
   - The financing of the health.
2. **Concept of the market in health**
   - The supply of care;
   - Request of care;
   - Financing of care.
3. **The funding to health**

- Social protection;
- Pooling of the financing of the Health;

4. **Financing of Health in Cameroon**
   - Community funding (CNPS, mutual health and system put in place by the state for public servants);
   - Non-Community funding (budget of the ministries concerned, public health and other…);
   - Bilateral and multilateral cooperation (NGOS, other donors …).
5. **The Health Planning**
6. **Health system and theirassessment**
   - Effectiveness;
   - Efficiency;
   - Cost;
   - Effectiveness/efficiency;
   - Cost / efficiency.

PHT353: Pharmaceutical III and Pharmacognosy III,Pharmaceutical III and Pharmacognosy III: Practice

- **Pharmaceutical III**

Objective: This course exposes the students to:

- The composition of dosage forms, the properties and characteristics of ingredients used in the different pharmaceutical formulations
- Enhance students' knowledge and skills in basic pharmaceutical operations (particle size reduction and separation, Mixing and homogenization, Clarification and filtration, Extraction processes)
- Introduce the students to the various type of packaging materials, their advantages, limitations and uses.

Content :

TU1: Capsules:

- Advantages and disadvantages of capsule dosage form
- Material for production of hard gelatin capsule, size of capsules,
- Methods of capsule filling, soft gelatin capsule shell and capsule content,
- Importance of base adsorption and minim/gm factors in soft capsule,
- Quality control, stability testing and storage of capsule dosage forms.
- Micro-encapsulation : Types of microcapsule, importance of microencapsulation in pharmacy, microencapsulation by multi orifice
- Spray drying, spray congealing, polymerization, complex, formulation, emulsion, air
- Suspension technique, coating pan and other techniques, evaluation of micro capsules.

TU2: Tablets:

- Formulation of different types of tablets, granulation technology on large-scale by various techniques, physics of tablets making, different types of tablet compression machinery and the equipments employed, evaluation of tablets.
- Coating of Tablets: Types of coating, film forming materials, formulation of coating solution, equipments for coating process, evaluation of coated tablet. Stability kinetics and quality assurance.
- Approaches to Sustained and controlled release dosage forms. In-vitro methods of evaluation.
- Formulation and evaluation of Ophthalmic, Nasal and Ear products.

TU3: Parenteral Products:

- Preformulation factors, routes of administration, water for injection,
- Pyrogenicity, nonaqueous vehicles.
- Formulation details, containers and closures and their selection.
- Prefilling treatment, washing of containers and closures, preparation of solution and suspensions, filling and sealing of ampoules, vial, infusion fluids, lyophilization
- Preparation of sterile powders, equipment for large scale manufacture and evaluation of parenteral products.

TU4: Surgical Products:

- Definition, primary wound dressing, absorbents, surgical cotton, surgical gauzes etc,
- Bandages, adhesive type, protective cellulosic hemostasis, official dressings, absorbable and non-absorbable sutures, ligatures and catguts.
- Packaging of Pharmaceutical Products: Packaging component types, specifications and methods of evaluation, stability aspects of packaging equipments, factors influencing choice of containers, legal and other official requirements for containers, package testing.

- **Pharmaceutics III Practicals**

PU1: Preparation, Evaluation, Packing of the following dosage forms.

- Capsules : chlororamphénicol capsules IP
- Parenteral : Dextrose – NaCl IV infusion IP
- Parenteral : Metronidazole infusion
- Eye drops: chlororamphénicol eyedrop

PU2: Evaluation of Materials used in pharmaceutical packaging.

- **Pharmacognosy III**

Objective: At the end of this study, students will discover the biological sources of some chemicals, how their presence is being tested, their uses, etc.

Content :

TU1: Carbohydrates:

- Biological sources, chemical constituents, adulterants and uses of: Starches, Acacia gum, Tragacanth, Sterculia, Guargum, Plantago, Pectin, Sodium alginate, Agar, Baeland Honey.

TU2: Lipids:

- Biological sources, chemical constituents, adulterants & uses of: Arachis oil, castor oil, sesame oil, cotton seed oil, olive oil, chalmogra oil, shark liver oil, cod liver oil, neem oil, kokum bitter, rice bran oil, guggul lipids.

TU3: Tannins

- Biological sources, chemical constituents, chemical test and uses of: pale catechu, black catechu, Nutgalls, Terminalia belerica, Terminalia chebula, Terminalia arjuna.

TU4: Volatile oils

- Biological sources, chemical constituents, adulterants and uses of: Black pepper, Turpentine, Mentha, Cinnamon, Cassia, Lemon peel, Orange peel, Lemon grass, Citronella, Caraway, Dill, Spearmint, Clove, Anise, Star anise, Fennel, Nutmeg, Eucalyptus, Palmarosa, Cardamom, Gaultheria.

TU5: Resinous drugs

- Classification, formation and chemical nature. Biological sources, chemical constituents, identification test, adulterants and uses of: Benzoin, Peru balsam, Tolu balsam, Colophony, Myrrh, Jalap, Colocynth, Ginger, Turmeric, Capsicum, Cannabis, Podophyllum.

TU6: Glycosides

- Nature and classification. Biological sources, chemical constituents, adulterants and uses of: Digitalis, strophathus, squill, oleander, cascara, aloe, rhubarb, senna, quassia, quillaia, glycyrrhiza, ginseng, gentian, senega, ruta, wild cherry, Bitter almond. Biosynthesis of Cardiac and anthraquinone glycoside.

TU6: Alkaloids

- Biological sources, chemical constituents, adulterants and uses of: Belladonna, Hyoscymus, Stramonium, Lobelia, Coca, Coffee, Tea, Cinchona, Opium, Ipecac, Nux vomica, Ergot, Rauwolfia, Physostigma, Vinca, Veratrum, EPWdra, Colchicum, Pilocarpus, Aconite, Solanum xathocarpum. Biosynthesis of tropane, cinchona and opium alkaloids.

- **Pharmacognosy III Practical**

PU1: Identification of drugs studied in theory on the basis of morphological and sensory characters.

PU2: Microscopy of: Quassia, Cinchona, Ipecac, Nux vomica, Rauwolfia, Cinnamon, Caraway, Clove, Fennel, And Aconite.

PU3: Chemical tests of: Starches, Acacia gum, Tragacath, Cinchona, Ipecac, Nux vomica, EPWdra, Colchicum.

PU4: Pharmacognosy tour for field identification of medicinal and aromatic plants.

PU5: Preparation of herbarium sheets and monograph on one of the collected plant during tour.

PHT354: Clinical Pharmacology III, Clinical Pharmacology III: Practice

- **Clinical Pharmacology III**

Objectives: At the end of this study, the students will be required to know;

- The drugs of the nervous system, their Mode of action, side effects, interactions, toxicity and management
- Management of the various kinds of pains and other inflammatory conditions.
- The various drugs that act on the cardiovascular system and the combination therapy in the of drug toxicity.
- Treatment of hypertension and other cardiovascular related diseases.
- The dose, side effects, drug interaction and management of toxicity of the drugs studied

Content:

TU1: Drugs Acting on Central Nervous System;

- Synaptic transmission in the CNS.
- General anaesthetics, Dissociative and neurolept- anaesthesia.
- Hypnotics; sedatives and Alcohol.
- Antiepileptics.
- Psychopharmacological agent.
- Antiparkinsonian drugs.
- Non-steroidal analgesics, anti-inflammatory and anti-pyretic agents, drugs used in gout.
- Narcotic analgesics, opiod pois oning and treatment.
- CNS stimulants and Nootropic agents.
- Local anaesthetics.

TU2: Drugs Acting on Cardiovascular System

- Cardiac glycosides and positive ionotropic agents.
- Antiarrhythmic drugs.
- Antihypertensive drugs.
- Coronary vasodilators and drugs used in angina.
- Hypolipidemic drugs.
- Fibrinolytic agents.
- Nitric oxide.

- **Clinical Pharmacology III Practical**

PU1: Stages of chlororamphénicol and ether anesthesia with and without premedication.
PU2: Study of PWnobarbitone induced hypnosis (Demonstration).
PU3: Seminars on the drugs studied in theory.

PHT355: Pharmaceutical Chemistry III and Pharmaceutical Chemistry Practice III

- **Pharmaceutical Chemistry III**

Objective: At the end of this course, the student should understand the

- Chemistry (structure, physical and chemical properties)
- Structure activity relationships of drugs in relation to pharmacodynamic and pharmacokinetic profile
- Sources/synthesis, classification and the application of drugs studied.

Content:

TU1: The cardiovascular system

- Cardiac glycosides and positive ionotropic agents.
- Antiarrhythmic drugs.
- Antihypertensive drugs.
- Coronary vasodilators and drugs used in angina.
- Hypolipidemic drugs.
- Fibrinolytic agents.
- Nitric oxide.

TU2: Drugs Affecting the Central Nervous System

- General anesthetics
- sedative-hypnotics
- anticonvulsants
- antipsychotics
- anxiolytics
- antidepressants
- hallucinogens
- antiparkinson agents
- opiate analgesics
- nonopiate analgesics
- Nonsteroidal anti-inflammatory agents.
- Drugs Affecting the Peripheral Nervous System: Local anesthetics, skeletal muscle relaxants.
- Drugs Affecting the Autonomic Nervous System: Adrenergic agents, antiadrenergic agents, cholinergic agents, anticholinergic and antispasmodic agents, histamine and antihistamines.

- **Pharmaceutical Chemistry III Practical**

PU1: Studies of the synthetic and metabolic pathways of some of the drugs studied in theory.

PHT356: Clinical Internship and Research Project Evaluation

- **Clinical Internship**
- **Research Project Evaluation**

PHT357: Occupationnal medicine, Civics education and Law

- **Occupationnal medicine**
- **Civic Education and Ethics: 3 credits (45 hours); L, T, sPW**
  - **Concepts:**
    - The citizen;
    - The nation;
    - The State;
    - Public goods - collective property;
    - The freedoms;
    - The public service;
    - Problem of ethics,
    - Ethics, Law and reason;
    - Management and ethics of responsibility;
    - Ethics and management
- **Medical law**

Objective: To know the components of medical law.

Content:

- Chapter one: criminal law
- Chapter two: criminal responsibility
- Chapter three: labour law
- Chapter four: some rights of the employee under the labour rule
- Chapter five: civil status registration
- Chapter six: right of women and children under the code
- Chapter seven: tort
- Chapter eight: inheritance, succession and wills
- Chapter night: introduction to human right
- Chapter ten: some international right instruments.

PHT361:Pharmaceutical Biotechnology, Pharmaceutical Legislation

- **Pharmaceutical Biotechnology**
- **Pharmaceutical Legislation**

Objective:

Content:

TU1: Historical Background of Drug legislation in Cameroon, Code of Ethics for Pharmacists.

TU2: Role of the Cameroon Pharmacy association

TU3: Drug Laws (A detailed study: Case study (actual/simulated)

- Prevention of cruelty of animals act.
- Pharmacy Act 1948.
- Drugs and cosmetic Act 1940, Rules 1945.
- Narcotic Drugs and Psychotropic Substances Act, and Rules there under.
- Drugs and Magic Remedies (Objectionable Advertisements) Act 1954.
- Medicinal and Toilet Preparations (Excise Duties) Act 1955, Rules 1976.
- Poison Act.
- Factory Act.
- Medical termination of pregnancy Act.
- The Drug (price control) order.
- The Insecticide Act.

PHT362: Community Health and Hygiene Sanitation

- **Community Health**

Objective: The students should be able to identify factors which influence the health of the population and how to deal with them appropriately

Content:

TU1: Health Care

- Background of community health in Cameroon
- History and evolution of PHC in Cameroon
- Reorientation of PHC and its objectives / implementation in Cameroon.
- Man Power
- Other resources

- Alma-Ata declaration of PHC
- Lusaka Conference. Bamako initiative (implication in Cameroon)
- Organization and functioning
- Health coverage
- Community health
- Levels of health care:
  - Central
  - Intermediate and
  - Peripheral levels.
- The Health District
- Health Area
- An integrated health center

- Minimum package of activities of:
  - An integrated health center
  - A district hospital
- Principles of care in an integrated health center

  TU2: Health care financing
  - Co-financing
  - Co-management
- Community participation
- Cost Recovery
- Essential drugs
- Intersectoral and multisectoral collaboration
- Dialogue structure
  - Description
  - Criteria for selecting members.
  - Functions of a health community
- Group dynamics
- Leadership
- Motivation
- Supervision
- Meetings

  Community survey/community study.

➢ **Hygiene and Sanitation**

Objective:

Content:

- Definition and objectives
- Microorganisms and infection
- Notions of general Epidemiology
- Field notions: Resistive, receptivity
- Personal hygiene
- Nutrition
- Environmental hygiene
- Hospital hygiene
- Nosocomial infections and infection control
- Nursing hygiene

PHT363: Pharmaceutical IV and Pharmacognosy IV,Pharmaceutical IV and Pharmacognosy IV: Practice

➢ **Pharmaceutical IV**

Objective: This course exposes the students to;

- The composition of dosage forms, the properties and characteristics of ingredients used in the different pharmaceutical formulations

- Enhance students' knowledge and skills in basic pharmaceutical operations (particle size reduction and separation, Mixing and homogenization, Clarification and filtration, Extraction processes)
- Introduce the students to the various type of packaging materials, their advantages, limitations and uses.

Content:

TU1: Study of physical properties of drug like;

- Physical form
- particle size, shape, density, wetting, dielectric constant, Solubility, dissolution and organoleptic properties and their effect on formulation, stability and bioavailability.

TU2: Liquid Dosage Forms:

- Introduction, types of additives used in formulations, vehicles, stabilizers, preservatives, suspending agents, emulsifying agents, solubilizers, colors, flavours and others
- Manufacturing packaging & evaluation of clear liquids, suspensions and emulsions.

TU3: Semisolid Dosage Forms:

- Definitions, types, mechanisms of drug penetration, factors influencing penetration,
- Semisolid bases and their selection,
- General formulation of semisolids, clear gels & manufacturing procedure, evaluation and packaging.

TU4: Suppositories:

- Ideal requirements, bases, manufacturing procedure
- Packaging and evaluation.

TU5: Pharmaceutical Aerosols:

- Definition, Propellants, general formulation
- Manufacturing and packaging methods, pharmaceutical applications.

TU6: Cosmetology and cosmetic Preparations:

- Structure of skin, formulation of cold cream, vanishing cream, and cleansing cream, all purpose cream, protective cream, antiperspirants, deodorant, face powder.
- Hair structure, Shampoos, Conditioner, Shaving and after shaving products,
- Dentifrice & Mouthwash,
- Lipstick
- Nail lacquer.

- **Pharmaceutics IV Practical**

Preparation, evaluation, and packing of:

PU1 Liquid Orals

PU2: Solutions: Strong Sodium salicylate oral solution BP, CHCMoraLydrate oral solution BP

PU3: Suspensions: Magnesium sulphate oral suspension BP Milk of magnesia IP, Aluminium hydroxide gel IP

PU4: Emulsions: Liquid paraffin oral emulsion BP

PU5: Semi-Solids: Ointments: Salicylic acid ointment BP, Whitfield ointment BP, Compound benzoic acid ointment

PU6: Preparation of cosmetic preparations

- Cold cream
- Cream shampoo
- Clear liquid shampoo
- Cleansing cream
- Protective cream, Sunscreen lotion, After shave lotion, Hand cream

- **Pharmacognosy IV**

Objectives: The students will be required to know;

- The various methods to isolate plant constituents
- The various plant products and their pharmacological action
- The different traditional medical systems
- The importance of traditional medicine
- Compare and contrast conventional and traditional medicine The uses of various medicinal plants

Content:

TU1: Isolation Techniques

- General methods used for the isolation and characterisation of alkaloids, lipids, glycosides, proteins, volatile oils, bioflavonoids, steroids, terpenoids and resins. Application of Column, Paper, Thin Layer, Ion Exchange and Gel chromatographic techniques, &partitioning methods for the isolation of phytopharmaceuticals.

TU2: Plant Biotechnology

- Tissue culture, Nutritional requirements, Callus and suspension culture, production of secondary metabolites, viz. Shikonin and Taxol.
- Biotransformation, immobilisation of cells and enzymes. Gene transfer in plants, application of plant biotechnology.

TU3: Methods of adulteration

- Deterioration of herbal drugs by insect. Evaluation of drugs by organoleptic, microscopic, physical, chemical and biological methods. WHO guidelines.

TU4: Quality control and Standardization of herbal drugs

- Extractive values, ash values, chromatographic techniques (TLC, HPTLC and HPLC) for determination of chromatographic markers, spectroscopic techniques and assay methods. Determination of heavy metals in herbal preparation and alcohol contents in Aristas and balsams.

- Quality control and rational use of herbal drugs as per WHO guidelines.

TU5: Traditional Medicine and some Herbal formulations

- Principles involved in Ayurveda, Sidha, Unani, Chinese and Homeopathic systems of medicines, preparation of Ayurvedic formulations like Aristas, Asava, Ghutika, Tailia, Churna, Avaleha, Ghrita and Bhasms; Unani formulations like Majooms, Safoofs.

TU6: Herbal cosmetics

- Shampoos (soapnut), Conditioners, (Amla, Henna, Hibiscus, Tea), Hair darkeners (Amla, Henna), Skin care (Aloe, Turmeric)

TU7: pharmacologically active drugs on the various systems of the bodye.g. on the cardiovascular system, gastro intestinal and respiratory systems etc.

- Common names, sources, active constituents and uses of: Peppermint (MeNTDa pepperita), Ginger (Zingiber officinalis), Garlic (Allium sativum), Onion (Allium cepa), Tulsi (Ocimum sanctum), Valerian (Valerian officinalis), Artemisia (Artemisia annua), Chirata (Swertia chirata), Ginseng (Panax ginseng), Saffron (Crocus sativa) etc

- **Pharmacognosy IV Practical**

PU1: Herbal formulation of Shampoos.
PU2: Preparation and evaluation of herbal drugs.
PU3: Identification of some traditional herbal drugs in the locality
PU4: Paper & Thin Layer Chromatography

PHT364: Clinical Pharmacology IV, Clinical Pharmacology IV: Practice

- **Clinical Pharmacology IV**

Objectives: At the end of this study, the students will know

- The management of acid related diseases and other illnesses of the gastro intestinal tract
- The treatment of non-productive and productive cough
- The management of asthma
- Drugs used in treating anemia, mineral and vitamin deficiencies, and the treatment of electrolyte imbalances.

Content:

TU1: Drugs Acting on Gastrointestinal System

- Purgatives.
- Antidiarrhoeal drugs.
- Antacids and treatment of peptic ulcers.
- Emetics and antiemetics.
- Prokinetic agents.

TU2: Drugs Acting on Respiratory System

- Expectorants.

- Antitussives, bronchodilators & other anti asthmatics
- Drugs used in common cold & nasal decongestants

TU3: Drugs Acting on the Blood and Blood Forming Agents

- Coagulants.
- Anticoagulants.
- Haematinics (iron, vitamin B12 and Folic acid).
- Plasma expanders.
- Diuretics

TU4: Psychopharmcological Agents:

- Antianxiety drugs- Diazepam, cHCMordiaze Poxide.
- Antidepressants – Imipramine, Amitriptyline Fluoxetine.
- Antispasmodic and Antiulcer drugs-Dicyclomine, Ranitidine, Omeprazole.
- Antipsychotic- Chlorpromazine, Haloperidol.
- Stimulants & Anoretics
- Sedatives, Hypnotics & Anesthetics
- Anti convulsant & anti parkinsonian drugs

TU5: Vitamins, macro & micro minerals

- **Clinical Pharmacology IV Practical**

Students will study drugs of the various systems and other drugs in this unit (especially anti anemic, vitamins and macro minerals) available in the local hospital and community pharmacies. Emphasis will be laid on dose, route of administration, indications, contraindications, side effects, and also their generic and trade names.

PHT365: Pharmaceutical Chemistry IV

Objective: At the end of this course, the student should understand the

- Chemistry (structure, physical and chemical properties)
- Structure activity relationships of drugs in relation to pharmacodynamic and pharmacokinetic profile
- Sources/synthesis, classification and the application of drugs studied.

Content:

TU1: Antihyperlipidaemics
TU2: The hormonal system
TU3: Inorganic pharmaceuticals
TU4: Radiopharmaceuticals

PHT366:Clinical Internship & Research Project Evaluation

Content:

While on the field for the last internship, students will be expected to carry out an individual research based on the proposals they have submitted. Students will be expected to defend their findings before the jury as a fundamental requirement for the award of the Higher Professional Diploma in Pharmacy Technology.

PHT367: Professional Ethics &Deontology

Objective: At the end of the course, the student should be able to know those values and obligations which practice in the profession.

Content: Nurse, Patient, nurse/patient relationship, obligations of the nurse, rights of the patient, rights and responsibilities of the nurse, deontology, ethics, etiquettes, patient reception in hospital, nurse/patient-relative relationship. Medical jurisprudence, lab practice and the law, forensic nursing, malpractice, civic duties, organization of Government, Common law, labour law, Criminal Law,etc.

1. **Health care Ethics**
   - Morality and Ethics: Norms, Deviances, Religion, Values, Beliefs, Cultures
   - Bioethics
   - MLS Ethics
   - Moral Development
   - Ethical Principles: Autonomy, Freedom, Privacy, Confidentiality, Beneficence, Fidelity, Motivation, Justice, Veracity and Responsibility.
   - Code of Ethics health workers.
   - Application of Ethics to MLS Practice: Respect For Life And Death, The Concept Of Dignity, Euthanasia, Human Rights, Rights of The Child, Rights of The Elderly, Patients Rights
   - Ethical Decision Making Frameworks and their Application in diagnosis
   - Context And Conflicts With Bioethical Standards
2. **Patient Rights:**
   - Respect for life and death, the concept of dignity, euthanasia
   - Care for dying patients: Palliative care, Confidentiality, Professional secrecy, Medical Research and Nursing care ethics.
   - Code of ethics.
   - Health Employee/employer contract law for health practitioners
   - MLS and the law
3. **Introduction to Law and Fundamental Rights**
4. **Law**
   - Sources of law
   - Law and enabling Acts (text of application)
   - The concept of legal personality
   - Civil responsibility (contract, TORT)
   - Criminal responsibility
   - The court and their jurisdictions
   - Labor law: formation and execution of labor contract, remuneration, condition of work, obligation of the employer and employee, termination of labor contracts
5. **Fundamental Rights**
   - The concepts of human rights

- Sources of human right
- Major international conventions of human rights
- International conventions relating to women
- Children and the rights of the minorities
- The role of the judiciary and the legislative in the protection of human rights
- The Cameroon national commission of human rights and liberties
- The civil society NGO's and the protection of human rights

6. **Law for Medical laboratory personnel**
   - Definition of Law, public law, private law
   - The client's and MLS personnel's' constitutional right
   - Administrative law related to licensing and regulate
   - on of health practice

Field : MEDICAL AND BIOMEDICAL SCIENCES

Specialty :

DENTAL THERAPY

Field:	MEDICAL AND BIOMEDICAL SCIENCES

Specialty:	DENTAL THERAPY

1. Objective of the training

The aim of this course is to develop basic orthodontic skills in dental therapy that will meet the needs of orthodontic practice and the standards required by the Dental Practice

2. Research Skills

→ Generic skills

- Possess the spirit of teamwork, especially in interdisciplinary situations and to master the functioning of the Cameroonian health system;
- Be responsible and reflective;
- Recognize your emotions and use them with the necessary professional skills;
- Have proven trust and confidence;
- Have critical ability and questioning;
- Develop ethical and a professional values;
- Possess interpersonal and marketing skills
- Act with autonomy and responsibility in the well-defined fields of its function.

→ Specific skills

- Provide essential dental therapy in the absence of the dental surgeon;
- Assist the dental surgeon to carry out consultations and more complicated procedures;
- Provide consultative, educational, research and other advisory services;
- Acquire the ability to adapt dental care to African conditions (the Cameroonian context as well) by using his/her creativity to devise therapy using local materials and to function comfortably in the African (Cameroonian) sociological context;
- Demonstrate a basic ability to appropriately use orthodontic instruments and equipment
- To provide a course of education and training that will enable dental therapists to assist an orthodontist in the provision of treatment and preventive services.

3. Opportunities

- Public function;
- Hospitals and private clinics;
- NGOs (Non-Governmental Organizations);

- Self-employment;
- Occupational Medicine ;
- Research and training.

4. Organization of the Teachings

Semester 1

Field : Medical and Biomedical Sciences		**Specialty: Dental Therapy**					
CODE	**Courses titles**	**Hourly Volume**					**Number Of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
DTH111	Anatomy - Physiology 1Cell Biology-Histology - General Chemistry	30	15	10	5	60	4
DTH112	Microbiology I - Bacteriology - parasitology - Biochemistry	60	5	5	5	75	5
Professional Courses 60% (4 UC) 18 credits 270 hours							
DTH113	Dental Histology and Embryology	50	20	15	5	90	6
DTH114	Dental, Oral anatomy and Physiology	20	15	5	5	45	3
DTH115	Oral microbiology and asepsis Internship I hospital immersion/ Medical Nursing Techniques	40	15	30	5	90	6
DTH116	Oral and Dental pathologies	25	10	5	5	45	3
Transversals Courses 10% (1 UC) 3 credits 45 hours							
DTH117	Medical law - French medical - Medical English - ICT	35	5	/	5	45	3
Total		**260**	**85**	**70**	**35**	**450**	**30**

Semester 2

Field : Medical and Biomedical Sciences		Specialty:Dental Therapy					
Code	Courses titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
DTH121	Anatomy and Physiology 2	30	15	10	5	60	4
DTH122	General Pharmacology and Elementary Mathematics II	40	15	15	5	75	5
Professional Courses 60% (4 UC) 18 credits 270 hours							
DTH123	Operative Dentistry	25	15	15	5	60	4
DTH124	Oral Diagnosis and treatment planning I	40	15	15	5	75	5
DTH125	Restorative dentistry	40	15	15	5	75	5
DTH126	Internship: Introductory Bloc Posting in Hospital	/	/	60	/	60	4
Transversals Courses 10% (1 UC) 3 credits 45 hours							
DTH127	Communication Sciences	30	5	5	5	45	3
Total		**205**	**80**	**135**	**30**	**450**	**30**

Semester 3

Field : Medical and Biomedical Sciences		Specialty: Dental Therapy					
Code	Course title	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
DTH231	Health Economics	40	20	10	5	75	5
DTH232	Health Information system	30	15	10	5	60	4
Professional Courses 60% (4 UC) 18 credits 270 hours							
DTH233	Science of Dental Materials	25	15	15	5	60	4
DTH234	Endodontics / Paedodontics	40	20	10	5	75	5
DTH235	Dental Ergonomics	30	15	25	5	75	5
DTH236	Internship : Clinical Practice-Bloc Posting II	0	0	60	0	60	4
Transversals Courses 10% (1UC) 3 credits 45 hours							
DTH237	Functional English and french	30	5	5	5	45	3
Total		**195**	**90**	**135**	**30**	**450**	**30**

Semester 4

Field : Medical and Biomedical Sciences		Specialty: Dental Therapy					
Code	Course title	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
DTH241	Community and Preventive Dentistry	40	20	10	5	75	5
DTH242	Health management	30	10	15	5	60	4
Professional Courses 60% (4UC) 18 credits 270 hours							
DTH243	Periodontics / Periodontology	40	15	15	5	75	5
DTH244	Dental anaesthesiology	25	10	20	5	60	4
DTH245	Oral Hygiene and Dental caries	40	10	20	5	75	5
DTH246	Clinical Internship 3	/	/	60	/	60	4
Transversals Courses 10% (1 UC) 3 credits 45 hours							
DTH247	Functional French	25	10	5	5	45	3
Total		**200**	**75**	**145**	**30**	**450**	**30**

Semester 5

Field : Medical and Biomedical Sciences		Specialty: Dental Therapy					
Code	Course title	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
DTH351	Health Care Management and Administration	40	9	0	11	60	4
DTH352	Structure, Function and Maintenance of Equipment	50	12	0	13	75	5
Professional Courses 60% (4 UC) 18 credits 270 hours							
DTH353	Full DenturesProsthodonticsand Partial Denture Prosthodontics	20	15	35	5	75	5
DTH354	Pediatric Dentistry	30	15	10	5	60	4
DTH355	Orthodontics	40	20	10	5	75	5
DTH356	Clinical Internship 4	/	/	60	/	60	4
Transversals Courses 10% (1 UC) 3 credits 45 hours							
DTH357	Research and Biostatistics-Health Care Ethics	20	10	10	5	45	3
Total		**190**	**37**	**180**	**43**	**450**	**30**

Semester 6

Field : Medical and Biomedical Sciences		Specialty: Dental Therapy					
Code	**Course title**	**Hourly Volume**					**Number Of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
DTH361	Epidemiology, Prophylaxis and Immunization	45	15	10	5	75	5
DTH362	Nursing care Technics	30	10	15	5	60	4
Professional Courses 60% (4 UC) 18 credits 270 hours							
DTH363	Dental Radiology	20	10	25	5	60	4
DTH364	Oral and Dental Surgery	35	15	20	5	75	5
DTH365	Research Project	10	10	40	15	75	5
DTH366	Clinical Internship 5	/	/	60	/	60	4
Transversals Courses 10% (1 UC) 3 credits 45 hours							
DTH367	Civics and Ethics - ICT	25	10	5	5	45	3
Total		**196**	**49**	**153**	**52**	**450**	**30**

5. Courses content

DTH111: Anatomy - Physiology I - Cell Biology- Histology - General Chemistry

- **Cell Biology - Histology: 1 credit (15 hours); L, T, SPW**

1. **Cell Biology and Histology**
   - The cell:
     - Structure;
     - Multiplication;
     - Physiology;
   - The tissue:
     - Epithelial tissue;
     - Connective tissue;
     - Nervous tissue;
     - Concept of genetics.

- **Anatomy - Physiology I: 4 appropriations (60 hours); L, T, SPW**

1. Nervous System

- Histology of the central and peripheral nervous system;
- Physiology of the central and peripheral nervous system: nervous influx, transmission of the influx (chemical mediators, synapse, driving plate), arc reflex;
- Organization of the central nervous system and functional localization: spinal cord, and medulla oblongata, brain, meninges and CSF;
- System Device nervous, cranial nerves, plexus;
- Neuro-vegetative system: sympathetic and parasympathetic.

2. The Endocrine System

- Endocrine pancreas;
- Thyroid: anatomy - Histology - physiology;
- Parathyroids: anatomy physiology, metabolism of calcium;
- Adrenals: Histology Anatomy, Physiology.
- System hypothalamo-pituitary;
- The stimulines.

3. Organ of meaning

- The eye : the view;
- The ear: hearing and balance;
- Smell: Taste;
- Touch.

4. System Musculoskeletal

- Ceos;
- The osteites;
- The osteomyelitis.

5. Digestive System

- General topography;
- The peritoneum;
- Main categories of foods :
    - ✓ Energy needs;
    - ✓ Animal heat.

6. Urinary system

- Structure and Physiology of the following organs: the kidney, the ureters, the urethra and bladder;
- Excretory Role of the skin.

➢ **General Chemistry: 1 credit (15 hours); L, T, SPW**

1. Mixture and pure body
2. The major processes of immediate analysis
3. Simple body-to-body composed
4. Constitution of the material:atoms, molecules and ions
5. Chemical notation, symbol, Valencia, formula
6. The fundamental laws of Combinations: chemical equation, acids, bases, salts, concept of PH, equivalent, nomenclature, redox, degree of oxidation, catalysis.

DTH112: Microbiology I - Bacteriology - Parasitology - Biochemistry

➢ **Microbiology - Bacteriology: 1 credit (15 hours); L, T, SPW**

1. Introduction to the Bacteriology

- Place in the living world and ecological role of micro-organisms (saprophytes, commensalism, symbiosis and pathogens).

2. General Bacteriology

- Structure of the bacterial cell, nutrition and growth, metabolism (anaerobic, aerobic conditions, fermentation), reproduction and genetics (genetic transfer, mutation), pathogenicity (notions of virulence, toxin).

3. Bacterial Ecology

- Role of the field, reference mechanism of the host against the infection (Immunosuppression, opportunistic bacteria, nosocomial infections).

4. Presentation of the bacterialsystematic

5. Study of the main species or bacterial groups pathogenic for man or likely to be

- Staphylococci, Streptococci, pneumococci, gonococcus, (history, habitat and epidemiology, fill pathogen, Bacteriological characters, diagnosis, treatment and prophylaxis).

6. Bacteriological techniques

- Basic Techniques (microscopic examinations, insulation and identification), different types of levy in Clinical Bacteriology (technical

and transport), methods of sterilization and preparation of media of cultures.

7. **Procedures for the sending of samples and of bacterial strains**
8. **Techniques of conventional identifications (1st part).**

- **Parasitology: 1 credit (15 hours); L, T, SPW**

1. Systematic study of human parasites, few definitions and concepts prior, mode of parasitism
2. Location of parasites
3. Epidemiology and evolutionary cycle
4. Parasitic disease: clinical description, pathology, defense of the body;
5. Prophylaxis (general and individual)

- **Biochemistry: 1 credit (15 hours); L, T, SPW**

1. Generality : enzyme, vitamin, a hormone
2. Basic concept of clinical biochemistry General: definition of a metering and exploration
3. Learning of normal and abnormal physiology of carbohydrates, lipids, proteins
4. Physiological study of different biochemical parameters of medical interest: techniques of biochemical assay and interpretation, normal values of biochemical constituents in biological fluids and pathological variations (1st part)

DTH113: Dental Histology & Embryology

Objective: At the end of this course, the dental therapy student should have studied the notions on histology and embryology of the teeth and gums.

Contents:

- Development of the oral and facial region.
- Development of the face and palate
- Development of the teeth.
- Eruption and exfoliation of teeth.
- Enamel. Dentine, Pulp, Cementum, Periodontium, Periodontal ligament.
- Oral mucosa, Salivary Glands.

DTH114: Dental, Oral Anatomy & Physiology

Content:

1. **Descriptive Anatomy:**
   - Deciduous teeth
   - Permanent teeth
   - Dento-osseous structures.
   - Arrangement of the teeth

2. **Head and Neck Anatomy**:
    - Anatomical nomenclature
    - Regions of the head
    - Skeletal system
    - Muscular system.
    - Blood supply
    - Glandular tissue
    - Nervous system
    - Lymphatic system.

DTH115: Oral Microbiology & Asepsis and Internship I : Hospital Immersion/Medical Nursing Techniques

- **Oral Microbiology & Asepsis**

Content:

1- Origin, development, and scope of microbiology: origin of microbiology, development of microbiology, germ theory of disease, development of oral microbiology, scope of microbiology.
2- General microbiology: bacterial cytology, bacterial physiology, bacterial metabolism,
3- Infection and resistance: non acquired body defense, acquired body defense, hypersensitivity,
4- Oral infection: the microbial flora of the oral cavity; streptococcus salivarius, streptococcus mitis, streptococcus sanguis, etc.
5- Infectious diseases: Staphylococci and staphylococcal infections, gram negative cocci, corynobacterium etc.
6- Asepsis.

- **Internship I: Hospital Immersion/Medical Nursing Techniques**

DTH116: Oral and Dental Pathologies

Contents:

1. ODP Semiology
2. Developmental disturbances of aral and paraoral structures
3. Dental caries, pathology of the pulp and periapical tissue.
4. Pathology of the periodontium, oral, face and neck infections
5. Oro-dental radiodiagnosis,
6. Cysts of the oral cavity, pathology of the salivary glands
7. Oral malignancies.
8. Oral Manifestations of systemic Disease

DTH117: Functional English/ Functional French

Objective: Upon completion of the course, the students should efficiently communicate with his/her colleagues and the patient in English and in French. Grammar, Conjugation, curriculum Vitae, Letter writing, reading Comprehension, Listening comprehension.Tenses. Also, besides grammar, a special emphasis should be placed on common vocabulary in the medical work.

Content:

1. History and socio-cultural background of English in Cameroon
2. Brief introduction to the structure of English
3. Phoneme
4. MorPWme
5. Word
6. Phrase
7. Sentence
8. Discourse
9. Basic grammaticfunctionist
10. Subject
11. Object
12. Grammatic categories: gender, personal number, count and non count nouns
13. Spelling and punctuation
14. Word formation
15. Collocations
16. Prepositions
17. Some confusable works
18. Synonyms, autonyms
19. Figure of speech
20. Idiomatic expressions
21. Reported speech
22. Difference between British and American English (pronunciation, grammar and vocabulary)
23. Sound of English: in isolation and in connected speech
24. Sentence stress and intonation
25. Types of discourse: expository, descriptive, narrative
26. Note taking (in lectures, in meetings)
27. Turn taking conversational English
28. Basic techniques of reading
29. Basic techniques of writing
30. Formal and informal letters
31. Application for a job
32. Administrative letters
33. Invitations

34. Writing CV
35. Writing minutes of meetings
36. General characteristics of the language in accordance with the area of specialization
37. Technical writing
38. Writing technical report
39. Writing projects
40. Writing technical instructions
41. Summarizing documents
42. Techniques in public speaking
43. Techniques of negotiation

- **French : 1.5 credits (22 hours 30mn)**

Objective : Ce cours de "French" a pour but de former des locateurs compétents pour pouvoir faire face à des situations courantes de communication en maîtrisant les différents paramètres de l'échange tels que le lieu, le temps, les interlocuteurs, les statuts de locateurs, les affectivités etc. Il vise également à amener les apprenants à être capable de comprendre et de produire à l'oral comme à l'écrit, des énoncés en langue française sur des sujets variés touchant leur domaine de prédilection, dont la médicine.

Indicative Content:

1. Vocabulaire

A. Introduction générale: apprendre ou ne pas apprendre le français? Pourquoi? Avantages et ouverture.
   - Saluer; se présenter quelqu'un
   - Demander une information; demander quelque chose, les sons [i], [j], [y], [w]; Demander une information, Proposer / accepter ou refuser une proposition; Demander une information; [m], [n], [ ] , Donner son opinion
   - Exprimer ses préférences; les sons [p], [b]
   - Préciser son identité; les sons [i], [y]
   - S'excuser et se justifier; le son [r], [ ], Dire l'heure
   - Parler de soi; les sons [u], [i], [y]; les sons [ ], [ɑ]

B. Caractériser les lieux (ce qu'on voit)
C. Caractériser des personnes (ce que l'on voit) Identifier et caractériser des personnes
D. Savoir téléphoner; communiquer, les sons [e], [ɛ], [ə], [ø]
E. Exprimer ses besoins et ses goûts, ses préférences et les justifier les sons [9], [k], [ʃ], [3
F. La négation; donner des ordres; répondre à des ordres.
G. L'interrogation; proposer, accepter / refuser une idée les sons [s], [z], [t], [d],
H. Medical French (medical terminologies in French).

2. Grammaire

1. Du verbe : Conjugaison aux temps communément utilisés – présent, passé composé ; imparfait, futur, conditionnel, et plus-que-parfait, l'impératif, l'infinitif, voix passive ;
2. De l'adjectif : Qualificatif, possessifs, démonstratifs, interrogatifs, numéraux, indéfinis ;
3. Du nom et son article: masculin/féminin ; singulier/pluriel ; dénombrable, et non-dénombrable ;
4. Du pronom : personnel, possessif, interrogatif, démonstratif, relatif, indéfini ;
5. De l'adverbe et de la locution adverbiale : pour dire comment, où, quand et pourquoi ;
6. Des fonctions grammaticales.

3. Expression et communication

7. Compréhension et interaction au cours d'une discussion technique ;
8. Communication orale courante ;
9. Communication orale interactive
10. De la phrase : simple, complexe, composée ; interrogative, déclarative, exclamative et impérative ;
11. Lecture rapide et compréhension de texte ;
12. synthèse d'un long texte
13. De la communication : rédaction de texte, d'instructions, de rapport, d'une correspondance –d'une lettre recommandation ou de motivation, d'une, demande d'emploi, d'une demande d'explication, d'une réponse à une demande d'explication, d'un CV ;
14. Gestion d'une table ronde/discussion : La prise de notes, la prise de parole
15. Expressions figées

DTH121: Anatomy and Physiology 2

- **Cardiovascular System: 1 credit (15 hours); L, T, SPW**

1- The Heart

16. Anatomy: configuring external and internal structure, histology of the heart muscle;
17. Physiology: automatism, revolution, noises of the heart, the electrocardiogram.

2- The vessels

18. Anatomy: arteries, veins: their structure, Anatomy of the large and the small circulation;
19. Circulatory physiology: blood pressure, venous circulation and capillary.

3- The blood

20. The plasma and dissolved substances, figurative elements, hematopoiesis, haemolysis;
21. Coagulation;

22. Blood group.

4- The reticulo-endothelialsystem

23. Rate, lymphatic, thymus.

- **Respiratory system: 1 credit (15 hours); L, T, SPW**

1- Anatomy

24. Upper airway (anatomy endoscopy and non-surgical), nasal cavity, pharynx, larynx, trachea;
25. Bronchus, lungs, pleura, anatomy and histology.

2- Physiology of Breathing

26. Mechanisms for regulating nervous;
27. Chemical phenomena.

- **Digestive system: 1 credit (15 hours); L, T, SPW**

1- General topography; the peritoneum
2- The main categories of food:
   - Energy Needs;
   - Animal heat.

- **Genito-urinary system (woman-man): 2 credits (30 hours); L, T, SPW**

1- Structure and Physiology of the following organs: the kidney, the ureters, the urethra and bladder
2- ExcretoryRole of the skin
3- Description anatomy and physiology of the genitalia of the Man and the woman

DTH122: General Pharmacology and Elementary Mathematics

- **General Pharmacology: 4 credit (60 hours); L, T, SPW**

1- Definition, Origins of drugs
2- Studies of medicinalforms
3- The medical prescription: Writing and reading of a medical prescription
4- Measuringequipment and dosage
5- Routes of administration of drugs
6- Pharmacodynamics and Pharmacokinetics
7- Regulation and modalities of distribution of drugs
8- Classification of medicines, a concept of toxicity
9- Prescription and dispensing of the drug to the hospital
10- Conservation and Monitoring
11- Drug intoxication

- **Elementary Mathematics II**

Content:

1. Descriptive statistics
2. Introduction- The tally; Frequency table; pictograms

3. Central tendencies: The mean; the mode; the median.
4. Frequency distribution; Variability: Range; Mean and Standard deviation.
5. Probability:
6. Basic definitions; the possibility space; Probability of an event; Compound events
7. Diagrammatic representation – Contingency table – Probability laws.
8. Differential Calculus:
9. The derivative: Gradient of a straight line curves; Maxima and minima Rate of change.
10. Applications in velocity and acceleration.
11. Integral calculus:
12. Integration as anti-differentiation – Constant of integration – Table of integration – integration as area under a curve – the definite integral. Applications.

DTH123: Operative Dentistry

Content:

1. Introduction, Nomenclature armamentarium
2. Principles of cavity preparation. Cavity preparation for amalgam
3. Cavity preparation for silicate cement, pulp protection, cavity liners and cavity lining procedures.
4. Temporal restorations, the restoration with Amalgam
5. Cavity Restoration with Silicate Cement.

DTH124: Oral Diagnosis and Treatment Planning I

Contents:

1. History taking in dentistry
2. Bacteria infections in the mouth
3. Viral infections in the mouth
4. Oral candidiasis
5. Recurrent aphthous stomatitis
6. Oral cancer
7. Abnormalities of the lips and tongue
8. Salivary gland disease

DTH125: Restorative Dentistry

Content:

1. What Is Restorative Dentistry?
2. Types of Dental Restoration
   - Direct.
   - Indirect.

3. Dental Restoration Costs and Insurance
4. Diagnostic and communication concepts
5. Principles of tooth preparation
6. Composite resins
7. Ceramic materials
8. The impression process
9. Contemporary adhesive cements
10. Esthetic post systems
11. Finishing and polishing esthetic
12. Restorative materials
13. Dental photography
14. Periodontal plastic surgery
15. Interdisciplinary implantology
16. Biomodification of tooth discoloration

DTH126: Internship:Introductory Bloc Posting in Hospital

Content :

1. Admissions and discharge
2. Reception
3. Vital signs
4. History taking
5. Identification of basic equipments in the different departments
6. Laboratory
7. etc

DTH127: Information and Communication Techniques

- **Information and Communication Techniques 1**

1- Concepts and architecture of computers
2- Definitions: computing, information, computer, data, program, software, drivers
3- System of enumeration of base 2, the unit of measure of the information and its multiple
4- Components of the computer (hardware and software)
5- Study of an operating system
6- Study of a text treatment software: Microsoft Word
7- Study of a spreadsheet/Microsoft Excel
8- Study of a presentation software: Microsoft PowerPoint

- **Information and communicationTechniques 2**

1- Creation of a simple database with a spreadsheet (How to Give a name to a cell range)
2- Validation of Data in a range of cells on a spreadsheet

3- Creation of the statistical tables simple (modality, workforce, frequency) and automatic filling with functions such as NB, NB.If and NB.If.ENS, Average, Sum, if
4- Creation of graphics from statistical tables
5- Presentation and use of a statistical software (ex: Epi Info)
6- Creation of a questionnaire on EPI info or other
7- Data entry and analysis
8- Definition of the concepts of the computer network
9- Presentation of the types of media and networks
10- Presentation of Internet (Connection, research, download)
11- Networks withoutwires
12- Learning of a software application
13- Numbering system
14- Computer Security: Virus and antivirus

DTH231: Health Economics

- **Health Economics: 2 credits (30 hours); L, T, SPW**

Objective: The main objective is to enable students appreciate the economic dimensions involved in the provision of efficient health care in a manner that it will be effective, equitable, affordable and sustainable, to a vast majority of the population at the same time minimizing all the available resources, especially when these resources Are often limited and are in high competition with other aspects of social life.

1- Basic concepts in health economics:
- The offer;
- The request;
- The financing of the health.

2- Concept of the market in health
- The supply of care;
- Request of care;
- Financing of care.

3- The funding to health
- Social protection;
- Pooling of the financing of the Health;

4- Financing of Health in Cameroon
- Community funding (CNPS, mutual health and system put in place by the state for public servants);
- Non-Community funding (budget of the ministries concerned, public health and other…);
- Bilateral and multilateral cooperation (NGOS, other donors …).

5- The Health Planning

6- Health system and theirassessment

- Effectiveness;
- Efficiency;
- Cost;
- Effectiveness/efficiency;
- Cost / efficiency.

DTH232: Heath Information System

Objective: The main objective of this course is to enable the student to be able to: Collect, summarize, analyze and present health information from an individual patient and community, in a manner that it can be useful in taking important decisions on individual patients and on the community and the health system.

Specific objectives:

- To assess and estimate (quantitatively and or/ qualitatively) the health problems of a community.
- To learn about the sources of health information – their strengths and weaknesses.
- To know the types of health information.
- To know the common tools for generating health information..
    - At a community (population) level eg questionnaires.
    - At individual patient level e.g history taking.
- The relevance of health information in health management and health policy
- To learn the different HIS in our communities

Content:

1- Definition and goals.
2- Statistical elements: units, populations, samples.
3- Statistical sources; statistical calculations.
4- The Health Information Process.
5- Data collection, collection media, forwarding, treatment.
6- Analysis and interpretation; feedback and decision taking.
7- Computerization of Health information
8- Role of health information in health care management

DTH233: Science of Dental Materials

Content:

1- Properties of Dental Materials.
2- Chemistry of setting, basic principles.
3- Technical considerations.
4- Impression compound.
5- Zinc oxide-Eugenol impression paste.
6- Reversible hydrocolloid impression.

7- Irreversible hydrocolloid impression
8- Synthetic resins, Denture Base Resins, Denture Cement Z-O-E
9- Denture silicate Cement, Dental porcelain.
10- Constitution of alloys, heat treatment, corrosion.
11- Dental amalgam alloys, abrasion and polishing
12- Root canal antiseptics, Iodoform powder, Acrylic resins

DTH234: Endodontics / Paedodontics

- **Endodontics**

Content:

1- Pulp Cavities of the Permanent Teeth;
2- Introduction: Maxillary first molar, Mandibular First Molar, Maxillary central and lateral
3- incisors, Maxillary premolars, Mandibular premolar, maxillary second and third molar,
4- Mandibular incisors, maxillary and mandibular canines.
5- Diseases of the Dental Pulp-Endodontics;
6- Introduction, classification of endodontic procedures
7- Etiology, histopathology, symptoms, diagnosis, and classification of diseases of the pulp.
8- Techniques of opening and filling chambers and canals.
9- Technical procedures for opening canals.
10- Techniques for small canals and difficult cases.
11- Methods of filling canals.

- **Paedodontics**

Content:

1- Introduction principal aims of treatment
2- Treatment planning for children
3- The anxious child
4- The child with toothache
5- Abnormalities of the teeth
6- Anatomy of primary teeth(relevance to cavity design)
7- Local anaesthesia for children
8- Restoration of carioue deciduous teeth
9- Dental trauma-NAI, injuries to primary teeth, injuries to permanent teeth,- crown/root fracture
10- Management of the avulsed tooth.

DTH 235: Dental Ergonomics

Objective: Providing equipment and instruments that adapt to the operator's fingers, arms, shoulders, neck, shoulders, backs, legs and eyes, use a clinical assistance and foot rest.

1- Introduction of principals of ergonomics
2- Discribing the dental clinics and the dental operatory architechture with respect to the necessary motions and activities
3- Rational of space, time and time work: describing the anthropometric characteristics, motion efficiency, acces to tools and instruments, complementary of teams roles and infections control
4- Operator and environemental harmony establishmen: describing the woorking prosture and stress free work.

DTH236 :Internship : Clinical Practice :Bloc Posting II

Content :

- Introductory posting in a hospital setting II: - Medical, Surgical, Paediatric, Obstetric and Gynaecology, Laboratory, Pharmacy, etc departments
- Write and present a clinical internship report

DTH237: French and Medical english

Objective: To develop communication skills in French and English language and thus enhance patient relationship as needed.

Content:

1- Different parts of the human body
2- Conversation in French and English as specific to health care
3- Translation of Medical Terms, prescriptions, technical and protocol forms, drug dispensation notices
4- Drafting of reports
5- Documentation research
6- Use of data sheets and protocols in the French language.
7- Health structures, premises, equipment, professional categories
8- Drafting of research topics
9- Dissertation on the professional articles
10- Interviews - Speech unto etc. ….
11- Health structures, premises, equipment, professional categories
12- Hospitals
13- The Hardware
14- The staff
15- The Role

16- The pathologies
17- The drugs

- **The pathologies by systems**
  - Urinary system;
  - Cardiovascular System;
  - Digestive system;
  - The endocrine system.
- **The dispensing of drugs**

DTH241: Community and Preventive Dentistry

Objective: This course focuses on the causes and prevention of dental caries and periodontal disease, the prevention of sports injuries to the mouth, and the harmful effects of smokeless tobacco. At the end of the course, the student will be able to perform clinical preventive procedures for individual patients.

Course content:

- Concept of preventive dentistry
- Dental caries and periodontal disease.
- Oral health education and promotion.
- Smokeless tobacco
- Plaque, calculus and dental stains
- Plaque removal, diet and dental health, fluorides, and pit and fissure sealants.
- Clinical preventive procedures: oral hygiene instruction, diet education, topical fluorides, sealants.
- Public speaking.

DTH242: Health Management

- **Health management**

Content:

1- The Cameroon Health organization
2- Missions of health units in the National territory: Health centers, district hospitals, Central hospitals, University teaching hospitals, private, lay, and denominational hospitals and clinics,
3- Free medical practice
4- Stakes of the health sector strategy
5- Relationship with health, national and international poverty-control organizations (other ministries, donors, international organizations, NGOs, associations),
6- Organization of public and private health units.
7- Legislation applying to health units,
8- Economic and financial management

9- Management of personnel, staff planning, and in service training,
10- Management of nursing care and drugs.
11- The Cameroon Health organization
12- Missions of health units in the National territory: Health centers, district hospitals, Central hospitals, University teaching hospitals, private, lay, and denominational hospitals and clinics,
13- Free medical practice
14- Stakes of the health sector strategy
15- Relationship with health, national and international poverty-control organizations (other ministries, donors, international organizations, NGOs, associations),
16- Organization of public and private health units.
17- Legislation applying to health units,
18- Economic and financial management
19- Management of personnel, staff planning, and in service training,
20- Management of nursing care and drugs.

DTH 243: Periodontics / Periodontology

Content:

1- Introduction
2- Etiology and pathogenesis of POD
3- Clinical oral Examination
4- Diagnosis, Treatment planning, Prognosis
5- Bacterial plague and methods of control
6- Detection and removal of calculus in periodontal therapy.

DTH244 : Dental Anaesthesiology

Objective: At the end of the course, the student should be able to describe in detail and demonstrate all dental anaesthesia procedures.

Content:

1- Pain: Basic concepts, pain perception, pain reaction, pain threshold, anatomical basis of dental pain, current views.
2- The control of pain: general anaesthesia, local anaesthesia, local anaesthesia and pregnancy, types of local anaesthesia.
3- Development of local aneathesia in dentistry.
4- Local anaesthetic solutions; potency and reliability, reversibility of action, safety,
5- duration effect, rapidity of onset, sterility, shelf-life, lidocaine, vasoconstrictors, other
6- constituents, metabolism and axcretion, mode of action of local anaesthetic solutions,

7- effectiveness of local anaesthesia.
8- Equipment:
9- Fundamental techniques
10- Local anaesthesia in the maxilla, mandible
11- Diagnosis and Management od difficulties, complications and Emergencies.

DTH245: Oral Hygiene and Dental Caries

- **Oral Hygiene**

Content:

- Summary of different brushing techniques
- Rolling Stroke Method – Vertical Action
- Vibratory Action

- **Dental Caries**

Content:

- Causes of dental caries;
- Etiology of dental caries;
- Pathogenesis of dental caries;
- Prevention of dental caries;
- Treatment of dental caries.

DTH246: Clinical Internship II

- **Clinical Internship II**

DTH247 Ethics and Civic Education and Medical Law

- **Civic and moral education: 2 credits (30 hours); L, T**

The Concepts

- The citizen;
- The Nation;
- The State;
- Publics Property and collective's goods;
- The freedoms;
- The public service;
- Ethics;
- Ethics, Law and reason;
- Ethical Problem ;
- Ethics and management.
- Civics
- Deontology

- Moral consciousness
- The universal declaration of Human Rights
- Good governance in public services
- The importance of civics to the life of the nation
- Functions of the state and its citizens
- Deontology, Professional ethics and professionalism
- Relationship between morality, law and ethics
- Codes of ethics

- **Medical Law**

Objective: To know the components of medical law.

Content:

- Chapter one: criminal law
- Chapter two: criminal responsibility
- Chapter three: labour law
- Chapter four: some rights of the employee under the labour rule
- Chapter five: civil status registration
- Chapter six: right of women and children under the code
- Chapter seven: tort
- Chapter eight: inheritance, succession and wills
- Chapter night: introduction to human right
- Chapter ten: some international right instruments

DTH351: Health Care Management and Administration

- **Health Care Management**

Objectives:
The main objectives of this course is to teach the general principles of management, and to enable the students to apply these principles comfortably in managiong various health problems at either the individual patient or community level.
Specific objectives;

1- To define management and trace is historical perspectives (know Donabedian and Demian)
2- To learn about the health management cycle
3- To learn the different stages of the management cycle i.e.
   - planning
   - implementation
   - monitoring and evaluation
   - re-defining objectives
   - assessment of the problems.
4- To learn about types of planning methods emphasis on:
   - Strategic planning

- Open systems planning
- Mixed planning,
- Incremental planning.

5- To learn about the advantages and disadvantages of planning.
6- To learn about types of evaluation.
7- To do special examples of health management e.g Drug management, health systems management etc.

- **Administration**

Content:

- Definition
- Characteristics of an administrative document.
- Administrative letter writing
- Administrative documents
- Public and private administrative letter writing
- Pay voucher, labour contract.

DTH352: Structure, Function and Maintenance of Equipments

Objective: A Dental Therapist work alone for long periods of time, therefore emphasis is placed on equipment maintenance and developing an understanding of how the equipment operates in order to facilitate repairs.

Content: The Dental Clinic, Its instruments and equipment. Instruments: types, identification, source of supply.

- The chair, function and accessories, Aspirating block and suction machine, foot control.
- Air compressor and the use of compressed air dentistry
- Principles and operation of the dental unit
- The Air vacuum system in dentistry.
- Dental Hand pieces and the air/water syringe.
- Fibre Optic Lights
- Operation of auxiliary equipment including X-ray unit chemicals
- Weekly maintenance
- Ordering of replacement instruments, supplies and equipment.
- Packing of equipment.

DTH353: Full Denture Prosthodonticsand Partial Denture Prosthodontics

Content *:*

- Treatment planning
- Principles of complete denture prosthodontics
- Recording the occlusion for complete dentures
- Trial insertion of complete dentures
- Fitting complete dentures

- Denture maintenance
- Cleaning dentures
- Denture problems and complaints

Content:

- Treatment planning for partial dentures
- Principles of partial denture fabrication
- Components of partial dentures
- Partial denture design
- Clinical stages for partial denture
- Overdentures

DTH354: Pediatric Dentistry

- **Pediatric Dentistry**

Content:

- Introduction-principal aims of treatment
- Treatment planning for children
- The anxious child
- The child with toothache
- Abnormalities of the teeth
- Anatomy of primary teeth (relevance to cavity design)
- Local anaesthesia for children
- Restoration of carioue deciduous teeth
- Dental trauma-NAI, injuries to primary teeth, injuries to permanent teeth,-crown/root fracture
- Management of the avulsed tooth.

DTH355: Orthodontics

Contents:

- Correct occlusion, the basis of orthodontics
- The etiology of malocclusion and associated maxillofacial deformities.
- Biologic problems pertaining to orthodontic treatment.
- Orthodontics appliances.
- The use of differential and optimum orthodontic forces.
- Diagnosis and assessment of treatment requirements. Treatment.
- Treatment of class III malocclusion.

DTH356: Clinical Internship IV

- **Clinical Internship IV**

DTH357: Research and Biostatistics

- **Introduction to research**

Objective: At the completion of this course, students should be able to:

- Understand the concepts of research in the biomedical sciences and be able to apply them
- Be able to accurately describe the fundamental concepts and approaches in qualitative and quantitative research methodology.
- Be able to find and appraise the available research literature through the use of valid resources, and thereby provide informed opinion.
- Be able to raise research questions in professional practice and apply appropriate research methodology to investigate and solve the research questions.
- Write a research proposal for approval by the Ethics Committee.
- Understand the role of bias and confounding and how to control for these in selection of study design.
- Appreciate the role of chance/random error, and the appropriate choice and application of statistical testing to assess this.
- Demonstrate the skills and knowledge required for independent or group research.

Content:

Introduction to research: Meaning and objectives of research; definition and Significance of health research, importance of research methodology for health science students.

Scientific research: Definition; C**haracteristic of scientific research:** Purposiveness, Rigor, testability, reliability, validity, replicability, precision, generalizability, objectivity); **Dimensions of scientific research** (concepts, theories, deductive & inductive reasoning, empiricism, variables, hypothesis, propositions **Elements of the Scientific Method**: Empirical Approach, Observation, Question, Hypotheses, Experiments, Analysis, Conclusion, and Replication

Scientific research process:

Categories of Research: Empirical and theoretical research, Basic and applied, Descriptive vs Analytical Research, Quantitative vs Qualitative Research, Conceptual vs Empirical Research, Etc.

- **Biostatistics I**

Objective: To summarize, analyze, present and interpret health statistical information.

Content:

1. **Mathematics**
   - Percentages, rates, proportions, simple and compound interest, discount
   - The electronic calculator
2. **Basic Algebra**
   - Algebraic expressions

- Functions
- Linear and Simultaneous Equations
- Graphs of Functions
- Quadratic Equations
- Arithmetic and Geometric progressions

3. Biostatistics

- Introduction
- Basic concepts in biostatistics
- Sampling techniques and data collection
- Variables (Qualitative and Quantitative)
- Presentation of data: Frequency and frequency distribution, Bar charts, Histograms, pie charts etc.
- Summarization of qualitative and quantitative data: mean, median, standard deviations and standard errors.

➢ **Biostatistics II**

Content

- The concept and Principles of Significant tests and confidence intervals
- Statistical testing and inference: The normal distribution and t-distribution, Chi squared test, Poison distribution, non-parametric tests etc.
- Errors in statistics

DTH361: Epidemiology, Prophylaxis and Immunization

Definition:

Incidence, prevalence, morbidity, lethality, contagiousness, attack rate, warning threshold, primary and secondary warning.

➢ **Epidemiological tripod**

- Epidemics, endemo epidemics, pandemics, demographic notions.

➢ **Prophylaxis**

- Definition, prophylactic measures, systemic reporting, early screening, isololation, quarantine, rat extermination, desensitization, molluse control.
- Disposal of waste water and human and animal refuse.
- Physical, chemical, and radioactive pollution control; chemo-prophylaxis.

➢ **Immunization**

- Definition, classification,
- Expanded program on immunization: origin, target population;
- Immunization strategies; Management of immunization activities.

- Planning, organization, supervision, evaluation of immunization coverage;
- Procurement and storage of vaccines,
- Monitoring of immunized population and IEC,
- Cameroon vaccination schedule: New-born, pre-school age, adults.

DTH362: Nursing care Technics

Content :

- General introduction
- Patient reception, records and patient room.
- Clerking (history taking)
- Preparation of the room, patients bed; description, types of beds, bed making,
- Personal hygiene. Prevention of bed sores, position in bed, care of the bed.
- Taking of vital signs

DTH363: Dental Radiology

Content:

- Basic principles of x-ray generation and image production.
- Patient management, Intraoral radiographic technique
- Radiation protection. Accessory radiographic techniques, darkroom.
- Film mounting and normal radiographic anatomy.
- Radiographic interpretation.

DTH364: Oral and Dental Surgery

Content:

- Scope and objectives
- Principles of surgery, History and examination
- Aseptic techniques
- Inflammation Repair and infection, the armamentarium
- Principles of teeth extraction and flap operation.
- Multiple extraction, Complication to exodontias and transplant.
- Surgical correction of bony anomalies
- The maxillary sinus, Cyst of the oral cavity
- Salivary glands: anatomy, development and diseases
- The TMJ

DTH365: Research Project

This aspect of the programme which leads unto the conduct, writing and presentation of a research thesis in the final examination, drills the students on the following areas:

- The research process: - irritation, developing a research proposal, developing research tools, conduct of research, data analysis;
- Report writing ;
- Literature review ;
- Presentation of research findings ;
- Validity and reliability in research ;
- Critical reading of research work.

DTH366: Clinical Internship V

- **Clinical Internship V**

DTH367: Professional Ethics &Deontology

Objective: At the end of the course, the student should be able to know those values and obligations which practice in the profession.

Content: Nurse, Patient, nurse/patient relationship, obligations of the nurse, rights of the patient, rights and responsibilities of the nurse, deontology, ethics, etiquettes, patient reception in hospital, nurse/patient-relative relationship. Medical jurisprudence, lab practice and the law, forensic nursing, malpractice, civic duties, organization of Government, Common law, labour law, Criminal Law,etc.

Health care Ethics

- Morality and Ethics: Norms, Deviances, Religion, Values, Beliefs, Cultures
- Bioethics
- MLS Ethics
- Moral Development
- Ethical Principles: Autonomy, Freedom, Privacy, Confidentiality, Beneficence, Fidelity, Motivation, Justice, Veracity and Responsibility.
- Code of Ethics health workers.
- Application of Ethics to MLS Practice: Respect For Life And Death, The Concept Of Dignity, Euthanasia, Human Rights, Rights of The Child, Rights of The Elderly, Patients Rights
- Ethical Decision Making Frameworks and their Application in diagnosis
- Context And Conflicts With Bioethical Standards

Patient Rights:

- Respect for life and death, the concept of dignity, euthanasia
- Care for dying patients: Palliative care, Confidentiality, Professional secrecy, Medical Research and Nursing care ethics.
- Code of ethics.
- Health Employee/employer contract law for health practitioners
- MLS and the law

Introduction to Law and Fundamental Rights

Law

- Sources of law
- Law and enabling Acts (text of application)
- The concept of legal personality
- Civil responsibility (contract, TORT)
- Criminal responsibility
- The court and their jurisdictions
- Labor law: formation and execution of labor contract, remuneration, condition of work, obligation of the employer and employee, termination of labor contracts

Fundamental Rights

- The concepts of human rights
- Sources of human right
- Major international conventions of human rights
- International conventions relating to women
- Children and the rights of the minorities
- The role of the judiciary and the legislative in the protection of human rights
- The Cameroon national commission of human rights and liberties
- The civil society NGO's and the protection of human rights

Law for Medical laboratory personnel

- Definition of Law, public law, private law
- The client's and MLS personnel's' constitutional right
- Administrative law related to licensing and regulation of health practice

Field : MEDICAL AND BIOMEDICAL SCIENCES

Spéciality :

DENTAL PROSTHESIS

Field:	MEDICAL AND BIOMEDICAL SCIENCES

Specialty:	Dental Prosthesis

1. The objective of the training

The aim of thistrainingis to provide studentswith skills which enable them to realize or to fabricate dental prosthetics such as crowns, dentures and veneers.

2. Research Skills

→ **Generic skills**

- Be responsible, reflexive and relational;
- Have adequate gestures and capacities;
- Develop adequate interpersonal and intrapersonal skills to be able to interact effectively with their patients, entourage and the health team
- Should be trustworthy and reliable;
- Have the capacity for critical thinking, analysis and questioning;
- Develop ethical values of a normal professional;
- Make thoughtful and informed decisions;
- Be able to act with autonomy and responsibility in his area ofcompetence.
- Master the computer tool and ICT

→ **Specific skills**

- Perform maintenance treatment for clients with removable dental prostheses
- Insert and issue a completed removable dental prosthesis
- Evaluate a removable dental prosthesis at try-in stage
- Construct and insert an implant retained overdenture
- Conduct dental prosthetic examination and develop treatment plan

3. Opportunities

- Public function;
- Private Dental Offices;
- Dental Schoolsand Manufacturers;
- Self-employment;
- Dental Laboratories

4. Organization of the Teachings

Semester 1

Field :Medical and Biomedical Sciences		Specialty: DENTAL PROSTHESIS					
Code	Course title	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental Courses Courses 30% (2 UC) 9 credits 135 hours							
DPR111	Anatomy and Physiology 1- Cell Biology-Histology - GeneralChemistry	30	15	10	5	60	4
DPR112	Microbiology I - Bacteriology - parasitology - Biochemistry	45	15	10	5	75	5
Professional Courses 60% (4 UC) 18 credits 270 hours							
DPR113	Hygiene and Sanitation	35	10	10	5	60	4
DPR114	Peadiatric Dentistry	20	10	25	5	60	4
DPR115	Oral Microbiology and Asepsis	35	15	20	5	75	5
DPR116	Oral and Dental Pathologies	35	15	20	5	75	5
Transversals Courses 10% (1 UC) 3 credits 45 hours							
DPR117	Functional English-Functional french	30	5	5	5	45	3
Total		**285**	**75**	**12**	**78**	**450**	**30**

Semester 2

Field : Medical and Biomedical Sciences		Specialty:DENTAL PROSTHESIS					
Code	Course title	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
DPR121	Anatomy and Physiology 2	55	17	4	14	90	6
DPR122	General pharmacology and drug administration	30	6		9	45	3
Professional Courses 60% (4 UC) 18 credits 270 hours							
DPR123	Partial Prosthodontics	25	15	15	5	60	4
DPR124	Dental Implantology	40	15	15	5	75	5
DPR125	Medico-Sanitary Techniques and First Aid/ Clinical Pharmacology1	40	15	15	5	75	5
DPR126	Internship: Hospital immersion	/	/	60	/	60	4
Transversals Courses 10% (1 UC) 3 credits 45 hours							
DPR127	Information and Communication Technology	30	10		5	45	3
Total		**235**	**56**	**94**	**65**	**450**	**30**

Semester 3

Field : Medical and Biomedical Sciences		Specialty: DENTAL PROSTHESIS					
Code	Course Title	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
DPR231	Nutrition	40	20	10	5	75	5
DPR232	Health Information System	30	15	10	5	60	4
Professional Courses 60% (4 UC) 18 credits 270 hours							
DPR233	Science of Dental Materials	25	15	15	5	60	4
DPR234	Materials for Dental Prosthethics	40	20	10	5	75	5
DPR235	Maxillofacial Prosthesis	30	15	25	5	75	5
DPR236	Clinical Practice I	/	/	60	/	60	4
Transversals Courses 10% (1 UC) 3 credits 45 hours							
DPR237	French and Medical English	30	5	5	5	45	3
Total		**230**	**65**	**93**	**62**	**450**	**30**

Semester 4

Field : Medical and Biomedical Sciences		Specialty: DENTAL PROSTHESIS					
Code	Course title	Hourly Volume					Number of credits
		L	T	P	SPW	Total	
Fundamental Courses30% (2 UC) 9 credits 135 hours							
DPR241	Community And Preventive Dentistry	40	20	10	5	75	5
DPR242	Health Economics	30	10	15	5	60	4
Professional Courses60% (4 UC) 18 credits 270 hours							
DPR243	Dental Ceramics	35	15	20	5	75	5
DPR244	Dental Anaesthesiology	30	10	15	5	60	4
DPR245	Veneer Placement	35	15	20	5	75	5
DPR246	Clinical Internship II	/	/	60	/	60	4
Transversals Courses 10% (1 UC) 3 credits 45 hours							
DPR247	Ethics Civic Education and Medical Law	30	5	5	5	45	3
Total		**227**	**70**	**100**	**53**	**450**	**30**

Semester 5

Field:Medical and Biomedical Sciences		Specialty: DENTAL PROSTHESIS					
Code	CourseTitle	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental Courses30% (2 UC) 9 credits 135 hours							
DPR351	Health Care Management and Administration	30	10	15	5	60	4
DPR352	Structure, Function and Maintenance of Equipment/ Dental prosthesis ergonomics	40	10	20	5	75	5
Professional Courses 60% (4 UC) 18 credits 270 hours							
DPR353	Orthodontic and Pedodontics Prosthetics	20	15	35	5	75	5
DPR354	Complete Dentures	30	15	10	5	60	4
DPR355	Orthodontics Appliance Construction	40	20	10	5	75	5
DPR356	Clinical Internship III	/	/	60	/	60	4
Transversals Courses 10% (1 UC) 3 credits 45 hours							
DPR357	Research and Biostatistics	30	5	5	5	45	3
Total		**190**	**37**	**180**	**43**	**450**	**30**

Semester 6

Field : Medical and Biomedical Sciences		Specialty: DENTAL PROSTHESIS					
Code	Course title	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
DPR361	Epidemiology, Prophylaxis and Vaccination	45	15	10	5	75	5
DPR362	Restorative Dentistry	30	10	15	5	60	4
Professional Courses 60% (4 UC) 18 credits 270 hours							
DPR363	Dental Radiology	20	10	25	5	60	4
DPR364	Oral and Dental Surgery	35	15	20	5	75	5
DPR365	Removable Partial Dentures	10	10	40	15	75	5
DPR366	Clinical Internship IV	/	/	60	/	60	4
Transversals Courses 10% (1 UC) 3 credits 45 hours							
DPR367	Professional ethics and Deontology	25	5	10	5	45	3
Total		**196**	**49**	**153**	**52**	**450**	**30**

5. Courses content

DPR111: Anatomy and Physiology 1 Cell Biology- Histology - General Chemistry

- **Cell Biology - Histology: 1 credit (15 hours); L, T, SPW**

1. **Cell Biology and Histology**
   - The cell:
     - Structure;
     - Multiplication;
     - Physiology;
   - The tissue:
     - Epithelial tissue;
     - Connective tissue;
     - Nervous tissue;
     - Concept of genetics.

- **Anatomy - Physiology I: 4 appropriations (60 hours); L, T, SPW**

1. Nervous System
- Histology of the central and peripheral nervous system;
- Physiology of the central and peripheral nervous system: nervous influx, transmission of the influx (chemical mediators, synapse, driving plate), arc reflex;
- Organization of the central nervous system and functional localization: spinal cord, and medulla oblongata, brain, meninges and CSF;
- System Device nervous, cranial nerves, plexus;
- Neuro-vegetative system: sympathetic and parasympathetic.

2. The Endocrine System
- Endocrine pancreas;
- Thyroid: anatomy - Histology - physiology;
- Parathyroids: anatomy physiology, metabolism of calcium;
- Adrenals: Histology Anatomy, Physiology.
- System hypothalamo-pituitary;
- The stimulines.

3. Organ of meaning
- The eye : the view;
- The ear: hearing and balance;
- Smell: Taste;
- Touch.

4. System Musculoskeletal
- Ceos;
- The osteites;
- The osteomyelitis.

5. Digestive System

- General topography;
- The peritoneum;
- Main categories of foods :
  - ✓ Energy needs;
  - ✓ Animal heat.

6. Urinary system

- Structure and Physiology of the following organs: the kidney, the ureters, the urethra and bladder;
- Excretory Role of the skin.

➢ **General Chemistry: 1 credit (15 hours); L, T, SPW**

1- Mixture and pure body
2- The major processes of immediate analysis
3- Simple body-to-body composed
4- Constitution of the material:atoms, molecules and ions
5- Chemical notation, symbol, Valencia, formula
6- The fundamental laws of Combinations: chemical equation, acids, bases, salts, concept of PH, equivalent, nomenclature, redox, degree of oxidation, catalysis.

DPR112: Microbiology I - Bacteriology - Parasitology - Biochemistry

➢ **Microbiology - Bacteriology: 1 credit (15 hours); L, T, SPW**

1- Introduction to the Bacteriology

- Place in the living world and ecological role of micro-organisms (saprophytes, commensalism, symbiosis and pathogens).

2- General Bacteriology

- Structure of the bacterial cell, nutrition and growth, metabolism (anaerobic, aerobic conditions, fermentation), reproduction and genetics (genetic transfer, mutation), pathogenicity (notions of virulence, toxin).

3- Bacterial Ecology

- Role of the field, reference mechanism of the host against the infection (Immunosuppression, opportunistic bacteria, nosocomial infections).

4- Presentation of the bacterialsystematic

5- Study of the main species or bacterial groups pathogenic for man or likely to be

- Staphylococci, Streptococci, pneumococci, gonococcus, (history, habitat and epidemiology, fill pathogen, Bacteriological characters, diagnosis, treatment and prophylaxis).

6- Bacteriological techniques

- Basic Techniques (microscopic examinations, insulation and identification), different types of levy in Clinical Bacteriology (technical and transport), methods of sterilization and preparation of media of cultures.

7- Procedures for the sending of samples and of bacterial strains

8- Techniques of conventional identifications (1st part).

- **Parasitology: 1 credit (15 hours); L, T, SPW**

1- Systematic study of human parasites, few definitions and concepts prior, mode of parasitism
2- Location of parasites
3- Epidemiology and evolutionary cycle
4- Parasitic disease: clinical description, pathology, defense of the body;
5- Prophylaxis (general and individual)

- **Biochemistry: 1 credit (15 hours); L, T, SPW**

1- Generality : enzyme, vitamin, a hormone
2- Basic concept of clinical biochemistry General: definition of a metering and exploration
3- Learning of normal and abnormal physiology of carbohydrates, lipids, proteins
4- Physiological study of different biochemical parameters of medical interest: techniques of biochemical assay and interpretation, normal values of biochemical constituents in biological fluids and pathological variations (1st part)

DPR113: Hygiene and Sanitation

Objective: To give a general notion on personal, environmental and hospital hygiene with emphases on preventive precautions.

Content:

- Definition and objectives
- Microorganisms and infection
- Notions of general Epidemiology: Pathogenic agents, ways of penetration of germs.
- Transmission mode- Reservoirs of germs.
- Field notions: Resistive, receptivity
- Vector agents, Notions of host, final host
- Personal hygiene (cleanliness, clothes, sport) – Hand washing.
- Food hygiene (balance, conservation---)
- Environmental and household hygiene
- Hospital hygiene: -habitat (over population, waste water, garbage)
- Waste disposal.

- Mental (sleep, noise, addictions alcohol, tobacco, drugs.)
- Water and drinks (domestic treatment of water).
- Nosocomial infections and infection control
- Nursing hygiene.

DPR114: Peadiatric Dentistry

Content:

- Introduction-principal aims of treatment
- Treatment planning for children
- The anxious child
- The child with toothache
- Abnormalities of the teeth
- Anatomy of primary teeth (relevance to cavity design)
- Local anaesthesia for children
- Restoration of carioue deciduous teeth
- Dental trauma-NAI, injuries to primary teeth, injuries to permanent teeth,-crown/root fracture
- Management of the avulsed tooth.

DPR115: Oral Microbiology & Asepsis

Content:

1- Origin, development, and scope of microbiology: origin of microbiology, development of microbiology, germ theory of disease, development of oral microbiology, scope of microbiology.
2- General microbiology: bacterial cytology, bacterial physiology, bacterial metabolism,
3- Infection and resistance: nonacquired body defense, acquired body defense, hypersensitivity,
4- Oral infection: the microbial flora of the oral cavity; streptococcus salivarius, streptococcus mitis, streptococcus sanguis, etc.
5- Infectious diseases:Staphylococci and staphylococcal infections, gram negative cocci,
6- Corynobacterium etc.
7- Asepsis.

DPR116: Oral and Dental Pathologies

Contents:

- ODP Semiology
- Developmental disturbances of aral and paraoral structures
- Dental caries, pathology of the pulp and periapical tissue.
- Pathology of the periodontium, oral, face and neck infections

- Oro-dental radiodiagnosis,
- Cysts of the oral cavity, pathology of the salivary glands
- Oral malignancies.
- Oral Manifestations of systemic Disease

DPR117: Medical Law - Medical French - Medical English - ICT

- **Functional English/ Functional French**

Objective: Upon completion of the course, the students should efficiently communicate with his/her colleagues and the patient in English and in French. Grammar, Conjugation, curriculum Vitae, Letter writing, reading Comprehension, Listening comprehension.Tenses. Also, besides grammar, a special emphasis should be placed on common vocabulary in the medical work.

Content:

- History and socio-cultural background of English in Cameroon
- Brief introduction to the structure of English
- Phoneme
- MorPWme
- Word
- Phrase
- Sentence
- Discourse
- Basic grammaticfunctionist
- Subject
- Object
- Grammatic categories: gender, personal number, count and non count nouns
- Spelling and punctuation
- Word formation
- Collocations
- Prepositions
- Some confusable works
- Synonyms, autonyms
- Figure of speech
- Idiomatic expressions
- Reported speech
- Difference between British and American English (pronunciation, grammar and vocabulary)
- Sound of English: in isolation and in connected speech
- Sentence stress and intonation
- Types of discourse: expository, descriptive, narrative
- Note taking (in lectures, in meetings)
- Turn taking conversational English

- Basic techniques of reading
- Basic techniques of writing
- Formal and informal letters
- Application for a job
- Administrative letters
- Invitations
- Writing CV
- Writing minutes of meetings
- General characteristics of the language in accordance with the area of specialization
- Technical writing
- Writing technical report
- Writing projects
- Writing technical instructions
- Summarizing documents
- Techniques in public speaking
- Techniques of negotiation

- **French : 1.5 credits (22 hours 30mn)**

Objective : Ce cours de "French" a pour but de former des locateurs compétents pour pouvoir faire face à des situations courantes de communication en maîtrisant les différents paramètres de l'échange tels que le lieu, le temps, les interlocuteurs, les statuts de locateurs, les affectivités etc. Il vise également à amener les apprenants à être capable de comprendre et de produire à l'oral comme à l'écrit, des énoncés en langue française sur des sujets variés touchant leur domaine de prédilection, dont la médicine.

Indicative Content:

1. Vocabulaire

- Introduction générale: apprendre ou ne pas apprendre le français? Pourquoi? Avantages et ouverture.
  - Saluer; se présenter quelqu'un
  - Demander une information; demander quelque chose, les sons [i], [j], [y], [w]; Demander une information, Proposer / accepter ou refuser une proposition; Demander une information; [m], [n], [ ] , Donner son opinion
  - Exprimer ses préférences; les sons [p], [b]
  - Préciser son identité; les sons [i], [y]
  - S'excuser et se justifier; le son [r], [ ], Dire l'heure
  - Parler de soi; les sons [u], [i], [y]; les sons [ ], [a]
- Caractériser les lieux (ce qu'on voit)
- Caractériser des personnes (ce que l'on voit) Identifier et caractériser des personnes
- Savoir téléphoner; communiquer, les sons [e], [ɛ], [ə], [ø]

- Exprimer ses besoins et ses goûts, ses préférences et les justifier les sons [9], [k], [ʃ], [3
- La négation; donner des ordres; répondre à des ordres.
- L'interrogation; proposer, accepter / refuser une idée les sons [s], [z],[t],[d],
- Medical French (medical terminologies in French).

2. Grammaire

- Du verbe : Conjugaison aux temps communément utilisés – présent, passé composé ; imparfait, futur, conditionnel, et plus-que-parfait, l'impératif, l'infinitif, voix passive ;
- De l'adjectif : Qualificatif, possessifs, démonstratifs, interrogatifs, numéraux, indéfinis ;
- Du nom et son article: masculin/féminin ; singulier/pluriel ; dénombrable, et non-dénombrable ;
- Du pronom : personnel, possessif, interrogatif, démonstratif, relatif, indéfini ;
- De l'adverbe et de la locution adverbiale : pour dire comment, où, quand et pourquoi ;
- Des fonctions grammaticales.

3. Expression et communication

- Compréhension et interaction au cours d'une discussion technique ;
- Communication orale courante ;
- Communication orale interactive
- De la phrase : simple, complexe, composée ; interrogative, déclarative, exclamative et impérative ;
- Lecture rapide et compréhension de texte ;
- synthèse d'un long texte
- De la communication : rédaction de texte, d'instructions, de rapport, d'une correspondance –d'une lettre recommandation ou de motivation, d'une, demande d'emploi, d'une demande d'explication, d'une réponse à une demande d'explication, d'un CV ;
- Gestion d'une table ronde/discussion : La prise de notes, la prise de parole
- Expressions figées

DPR121: Anatomy and Physiology 2

- **Cardiovascular System: 1 credit (15 hours); L, T, SPW**

1. **The Heart**
   - Anatomy: configuring external and internal structure, histology of the heart muscle;
   - Physiology: automatism, revolution, noises of the heart, the electrocardiogram.
2. **The vessels**

- Anatomy: arteries, veins: their structure, Anatomy of the large and the small circulation;
- Circulatory physiology: blood pressure, venous circulation and capillary.

3. **The blood**
   - The plasma and dissolved substances, figurative elements, hematopoiesis, haemolysis; - Coagulation; - blood group.
4. **The reticuloendothelialsystem**
   - Rate, lymphatic, thymus.

- **Respiratory system: 1 credit (15 hours); L, T, SPW**

1. **Anatomy**
   - Upper airway (anatomy endoscopy and non-surgical), nasal cavity, pharynx, larynx, trachea;
   - Bronchus, lungs, pleura, anatomy and histology.

2. **Physiology of Breathing**
   - Mechanisms for regulating nervous; - chemical phenomena.

- **Digestive system: 1 credit (15 hours); L, T, SPW**

1. General topography; the peritoneum
2. The main categories of food
3. Energy Needs;
4. Animal heat.

- **Genito-urinary system (woman-man): 2 credits (30 hours); L, T, SPW**

1. Structure and Physiology of the following organs: the kidney, the ureters, the urethra and bladder
2. ExcretoryRole of the skin
3. Description anatomy and physiology of the genitalia of the Man and the woman

DPR 122: General Pharmacology and Drug Administration

Content:

- Definitions
- Origin of drugs: Study of drug forms
- Drug prescription: Writing and interpretation of prescriptions
- Measuring instruments and dosage
- Drug administration routes
- Pharmaco-dynamics and Pharmaco-kinetic elements: :Liberation, absorption, elimination, metabolism, interactions and side effects
- Drug regulation and distribution conditions
- Storage and monitoring
- Arrangement of drug cupboards

- Recognition of somecommon drugs
- Drug poisoning

DPR123: Partial Prosthodontics

Content:

- Partially edentulous epidemiology, physiology, and terminology.
- Consideration for managing partial tooth loss
- Classification of partially edentulous arches
- Biomechanics of removable partial dentures
- Major and minor connectors
- Denture base considerations
- Principles of removable partial denture design
- Surveyingpreparation of mouth for removable partial dentures
- Preparation of abutment teeth
- Impression materials and procedures for removable partial dentures
- Support for the distal extension denture base
- Occlusal relationships for removable partial dentures
- Laboratory procedures
- Initial placement, adjustment, and servicing of the removable partial denture
- Relining and rebasing the removable partial denture
- Repairs and additions to removable partial dentures
- Interim removable partial dentures
- Removable partial denture considerations in maxillofacial prosthetics

DPR124: Dental Implantology

Content:

This course aims to:

- Develop your skills to successfully diagnose and plan dental treatment for patients based around dental implants
- Help you understand surgical techniques appropriate for the placement of implant components in the dento-alveolar tissues, immediately post-extraction, delayed placement and in augmented tissues
- Teach you to design, plan and undertake restorative procedures and to take appropriate records for the restoration of placements with a wide range of implant-supported prostheses
- Develop your skills in managing and maintaining clinical cases of a range of complexity for patients restored with dental implants
- Teach you to manage the treatment of patients with complications arising from the use of dental implants – both iatrogenic and pathogenic.

- What are Dental Implants?
- Types of dental implantation
- Endosteal implants
- Subperiosteal implants
- Oral Care Specifics to Implants

- An overview of the implant process
  - Assessment and treatment planning:
  - Implant placement:
  - Integration period:
  - The restorative phase:
  - Maintenance:

Bone grafting
Different implant procedures
Dental implant maintenance

DPR125: Medico Sanitary technics and first aids/Clinical PharmacologyI

- **Medico Sanitary technics and first aids**

Content:

- General introduction
- Patient reception, records and patient room
- Clerking (history taking)
- Preparation of the room, patient's bed: description, types of beds, bed making
- Personal hygiene, prevention of bed sores, position in bed, care of the bed
- Taking of vital signs
- Definition and objectives
- Microorganisms and infection.
- Notions of general Epidemiology
- Field notions: resistance, receptivity
- Personal hygiene
- Nutrition
- Environmental hygiene.
- Hospital hygiene.
- Nosocomial infections and infection control
- Nursing hygiene.

- **Clinical Pharmacology**

Clinical Pharmacology: 4 appropriations (60 hours); L, T, SPW

1. Drugs of infectious diseases

- The antibiotics;
- The sulfonamides;
- The antiseptics;
- The anti-TB drugs;

- The antivirals;
- The Pest Control;
- The antifungals.

2. The drugs in the pain and inflammation:

- Analgesics;
- The anti inflammatory drugs;
- Corticosteroids.

DPR126: Internship : Hospital Immersion

- **Hospital Immersion**

DPR127: Information and Communication Technology

- **Techniques of Information and Communication 1**

1. Concepts and architecture of computers
2. Definitions: computing, information, computer, data, program, software, drivers
3. System of enumeration of base 2, the unit of measure of the information and its multiple
4. Components of the computer (hardware and software)
5. Study of an operating system
6. Study of a text treatment software: Microsoft Word
7. Study of a spreadsheet/Microsoft Excel
8. Study of a presentation software: Microsoft PowerPoint

- **Technique of information and communication 2**

1. Creation of a simple database with a spreadsheet (How to Give a name to a cell range)
2. Validation of Data in a range of cells on a spreadsheet
3. Creation of the statistical tables simple (modality, workforce, frequency) and automatic filling with functions such as NB, NB.If and NB.If.ENS, Average, Sum, if
4. Creation of graphics from statistical tables
5. Presentation and use of a statistical software (ex: Epi Info)
6. Creation of a questionnaire on EPI info or other
7. Data entry and analysis
8. Definition of the concepts of the computer network
9. Presentation of the types of media and networks
10. Presentation of Internet (Connection, research, download)
11. Networks withoutwires
12. Learning of a software application
13. Numbering system
14. Computer Security: Virus and antivirus

DPR231: Nutrition

Content:

- The place of nutrition in Public Health problems.
- Types of nutrients and their functions
- Dietary planning
- Methods of evaluation of nutrient value
- Factor influencing nutrient availability, consumption and utilization.
- Nutrition and nutritional diseases
- Malnutrition
- Evolution of illness and nutrition
- Infant Nutrition
- Nutritional status of the pregnant and lactating woman.
- National and international organizations in charge of food and nutrition.
- Under nutrition
- Individual, family and community nutrition.

DPR232: Health Information System

Objective: After going through the course, the students should be able to:

- Define the main Concepts and Terminologies used in Health Management Information Systems.
- Describe the various components of a health information system
- Know the different sources and type of data for a health Information system.
- Undertake Health Data Management to provide health information capable of guiding the planners and stakeholders in health care delivery system.
- Understand the foundational basis for the National Health Management Information System Policy
- Describe Project cycle, Monitoring tools and Evaluation of health projects and programs.

Content:

Introduction: Definition of Concepts and Terminologies-data, information, management, health, system, health system, health information, health information system.

Determinants of health: Socio-economic Situations, Demographic Situation, Epidemiological Situation, Health Resources, Human Capital, Health Services, Sectoral Situations: Education, Agriculture, Mineral Resources, Water Resources, Transport, etc.

Components of health information systems: Health information resources, Health Indicators, data management, information product, Disease surveillance, monitoring, evaluation.

Health Data Management (Data **management cycle (Data collection, Analyses, Reporting, Dissemination, Data use**): Characteristics of good Data , Types and Sources of Health Data, Methods of Data Collection & some Standard Forms for Health information , Challenges of Health Data Collection, Basics of Data Processing and Analysis (computer –based & paper-based).

National Health Management Information Systems: Challenges and strategies

Monitoring and Evaluation: Programme cycle; Characteristics of Health programme monitoring system (Data collection, Analyses, Reporting, Dissemination. Data use).

DPR233: Science of Dental Materials

Contents:

1. Properties of Dental Materials.
2. Chemistry of setting, basic principles.
3. Technical considerations.
4. Impression compound.
5. Zinc oxide-Eugenol impression paste.
6. Reversible hydrocolloid impression.
7. Irreversible hydrocolloid impression
8. Synthetic resins, Denture Base Resins, Denture Cement Z-O-E
9. Denture silicate Cement, Dental porcelain.
10. Constitution of alloys, heat treatment, corrosion.
11. Dental amalgam alloys, abrasion and polishing
12. Root canal antiseptics, Iodoform powder, Acrylic resins

DPR234: Materials for Dental Prosthetics

Choosing a material for prosthetic dental reconstructions depends on careful consideration of the benefits, advantages, and disadvantages associated with this choice:

- Base metals: Nickel–chromium (Ni-Cr), Cobalt–chromium (Cr-Co), Titanium (Ti)
- Noble metals: Gold-platinum-palladium (Au-Pt-Pd), Gold-palladium-silver (Au-Pd-Ag), Gold-palladium (Au-Pd), ilver-palladium (Ag-Pd)
- Ceramics: Feldspathic, Feldspathic with lithium disilicate, Aluminized ceramics, Zirconia, Yttria-stabilized zirconia
- Cements: Zinc phosphate, Glass ionomer, Resin-modified glass ionomer, Resin cements,
- Properties and processing of precious metal alloys for biomedical applications
- Understanding dental implants
- Customized craniofacial implants: Design and manufacture

- In Vivo Exploration of Robust Implantable Devices Constructed From Biocompatible 3C–SiC
- Modelling fracture processes in orthopaedic implants
- Characterization and antifungal activity of the modified PMMA denture base acrylic
- Surface Complexation Modelling

DPR 235: Maxillofacial Prosthesis

Content:

1. **Types of maxillofacial defects**
   - Congenital
   - Acquired
   - Developmental
2. **Types of Maxillofacial Prosthesis**
   - Extra-oral (Craniofacial)
   - Intra-Oral (Stomatognathic)
   - Combination
3. **Indications of Maxillofacial Prosthesis**
   - After surgical intervention
   - After trauma
   - Congenital defects
   - Acquired defects
   - Prosthetic Vs. surgical rehabilitation
4. **Stomatognathic structures**
   - Problems associated with maxillofacial defects
   - Treatment of maxillary defects
   - Management of patient for Maxillofacial Prosthesis
   - Intra oral prostheses
   - Types of Obturator and its function
   - Different obturator bulb designs

DPR236 : Clinical Practice I

- **Clinical Practice I**

DPR237: French and English for Medical profession

Objective: To develop communication skills in French and English language and thus enhance patient relationship as needed.

Content:

- Grammar

- Different parts of the human body
- Conversation in French and English as specific to health care
- Translation of Medical Terms, prescriptions, technical and protocol forms, drug dispensation notices
- Drafting of reports
- Documentation research
- Use of data sheets and protocols in the French language.
- Health structures, premises, equipment, professional categories
- Drafting of researchtopics
- Dissertation on the professional articles
- Interviews - Speech unto etc. ….
- Health structures, premises, equipment, professional categories
- Hospitals
- The Hardware
- The staff
- The Role
- The pathologies
- The drugs

- **The pathologies by systems**
  - Urinary system;
  - Cardiovascular System;
  - Digestive system;
  - The endocrine system.
- **The dispensing of drugs**

DPR241: Community and Preventive Dentistry

Objective: This course focuses on the causes and prevention of dental caries and periodontal disease, the prevention of sports injuries to the mouth, and the harmful effects of smokeless tobacco. At the end of the course, the student will be able to perform clinical preventive procedures for individual patients.

Content:

- Concept of preventive dentistry
- Dental caries and periodontal disease.
- Oral health education and promotion.
- Smokeless tobacco
- Plaque, calculus and dental stains
- Plaque removal, diet and dental health, fluorides, and pit and fissure sealants.
- Clinical preventive procedures: oral hygiene instruction, diet education, topical fluorides, sealants.
- Public speaking.

DPR242: Health Economics

Objective: This course is an introduction to Health Economics.

It is meant to give Health science students basic principles regarding economics and its application to the health sector.

- This course focuses on issues relating to scarcity in the allocation of health resources
- It exposes students to basic theoretical and conceptual frameworks from economics that enable them to analyze the functioning of a health system critically.
- Importantly, they will learn how to apply economic theories of demand, supply, and markets.

Content:

Unit 1. Introduction to Health Economics:

Definition of basic concepts: Health, Healthcare, Economics, Efficiency, Scarcity, Health Economics, opportunity cost, etc

Unit 2. Basic concepts of supply and demand analysis:

Definition of Demand and supply, Demand curve, supply curve, Market Equilibrium Elasticity of demand & supply.

Unit 3 Health care market:

General features of the health Care: Perspectives of Health, Distinctive characteristics of the health Care services, Equity and health care, Demand for health care, Supply of health care, Health and Economic Development

Unit 4. Cost Concepts & Economic Evaluation:

Definition of Cost, Types of costs, Types of Economic Evaluation

Unit 5. Health Care Financing & Resource Allocation:

Definition of the health sector Financing, Factors influencing health care Financing, Sources of National Health care financing systems. Barriers to access of heath care.

Unit 6 Resource allocation:

Definition, Reasons for resource allocation in health care, Rationing in health care: Ethics and levels of rationing - Ethical theories: *Utilitarian*, *Deontological*, *Rawlsian*, Implicit and explicit rationing, Efficiency& Equity in resource allocation, Levels of resource allocation:

Unit 7 Macro- allocation (global, National, Allocating resources to healthcare versus other social needs. Allocating resources within the healthcare sector, **Micro:** Allocating resources among individual patients.

Factors Complicate Ethical Resource Allocation Decisions

Unit 8 The Role Of Government In Health: Problems of health policy & possible strategies.

- Approaches to allocation: Need based analysis, economic evaluation analysis,
- Other countries' approaches: Oregon Health Plan
- New Zealand, UK,

DPR 243: Dental Ceramics

Content:

- Scope and objectives
- Principles of surgery, History and examination
- Aseptic techniques
- Inflammation Repair and infection, the armamentarium
- Principles of teeth extraction and flap operation.
- Multiple extraction, Complication to exodontias and transplant.
- Surgical correction of bony anomalies
- The maxillary sinus, Cyst of the oral cavity
- Salivary glands: anatomy, development and diseases
- The TMJ
- Fractures of the jaws.

DPR244 : Dental Anaesthesiology

Objective: At the end of the course, the student should be able to describe in detail and demonstrate all dental anaesthesia procedures.

Content:

- Pain: Basic concepts, pain perception, pain reaction, pain threshold, anatomical basis of dental pain, current views.
- The control of pain: general anaesthesia, local anaesthesia, local anaesthesia and pregnancy, types of local anaesthesia.
- Development of local aneathesia in dentistry.
- Local anaesthetic solutions; potency and reliability, reversibility of action, safety,duration effect, rapidity of onset, sterility, shelf-life, lidocaine, vasoconstrictors, otherconstituents, metabolism and axcretion, mode of action of local anaesthetic solutions,effectiveness of local anaesthesia.
- Equipment:
- Fundamental techniques
- Local anaesthesia in the maxilla, mandible
- Diagnosis and Management OD difficulties, complications and Emergencies.

DPR245: Veneer Placement

Content:

Definition,

Dental Veneer Placement

- Active periodontal disease
- Occlusal imbalances
- Other active pathologies

Veneer preparation

- Providing sufficient thickness for the structural integrity of the PLV
- Providing optimal clearance in relation to the opposing dentition

- Accommodating space for the new morphology
- Accommodating for a shift in the midline
- Accommodating for change in tooth inclination
- Removal of decay

Temporization

Cementation

Complication of dental veneer placement

- Dislodgement of the PLV owing to bond failure
- Fracture of the PLV due to occlusal interference, bruxism, trauma, and/or excess unsupported porcelain (>2 mm)
- Discoloration of margins
- Recurrent decay
- Occlusal interferences

DPR246: Clinical Internship II

- **Clinical Internship II**

DPR247: Ethics and Civic Education and Medical Law

- **Civic and moral education: 2 credits (30 hours); L, T**

The Concepts

- The citizen;
- The Nation;
- The State;
- Publics Property and collective's goods;
- The freedoms;
- The public service;
- Ethics;
- Ethics, Law and reason;
- Ethical Problem ;
- Ethics and management.
- Civics
- Deontology
- Moral consciousness
- The universal declaration of Human Rights
- Good governance in public services
- The importance of civics to the life of the nation
- Functions of the state and its citizens
- Deontology, Professional ethics and professionalism
- Relationship between morality, law and ethics
- Codes of ethics

- **Research Project**
  - **Initiation to research: 1 credit (15hours); L, T, P, SPW**
    1. In Health Research
    2. Sources of Knowledge
    3. Methods of Reasoning
    4. Stages of the research process (rational, assumptions, literature review, methodology, results/discussion, summary, bibliography)
    5. Classification of research
    6. Establishment of the Questionnaires
    7. Ethics
    8. Preparation and Presentation of Research Reports
    9. Case practice: drafting of protocols of research

- **Construction of a Research proposal**: **Background:** Literature review, formulating the problem statements, justification of studies, objectives, framing the questions according to general and specific objectives; is developing a testable hypothesis to achieve the objectives for quantitative research selection, referencing, etc.; Ethical considerations; Work plan: personnel; timetable project administration; Plans for dissemination.

Data collection and management: Design and Pretesting of measuring instruments (reliability and validity of instruments);training of interviewers; quality control of measurements; computerization, checking and validating, measurements; the issue of missing observations, statistical summarization of information; testing of hypothesis.

Analysis & presentation of Results; Report writing and format.

DPR351: Health Care Management and Administration

- **Health Care Management**

Objectives:

The main objectives of this course is to teach the general principles of management, and to enable the students to apply these principles comfortably in managiong various health problems at either the individual patient or community level.

Specific objectives;

1- To define management and trace is historical perspectives (know Donabedian and Demian)
2- To learn about the health management cycle
3- To learn the different stages of the management cycle i.e.
   - planning
   - implementation
   - monitoring and evaluation
   - re-defining objectives
   - assessment of the problems.

4- To learn about types of planning methods emphasis on:
   - Strategic planning
   - Open systems planning
   - Mixed planning,
   - Incremental planning.
5- To learn about the advantages and disadvantages of planning.
6- To learn about types of evaluation.
7- To do special examples of health management e.g Drug management, health systems management etc.

➢ **Administration**

Content:

- Definition
- Characteristics of an administrative document.
- Administrative letter writing
- Administrative documents
- Public and private administrative letter writing
- Pay voucher, labour contract.

DPR 352: Structure, Function and Maintenance of Equipments/Dental Prothesis Ergonomics

1- Structure, Function and Maintenance of Equipments

Objective: A Dental Therapist work alone for long periods of time, therefore emphasis is placed on equipment maintenance and developing an understanding of how the equipment operates in order to facilitate repairs.

Content: The Dental Clinic, Its instruments and equipment. Instruments: types, identification, source of supply.

1. The chair, function and accessories, Aspirating block and suction machine, foot control.
2. Air compressor and the use of compressed air dentistry
3. Principles and operation of the dental unit
4. The Air vacuum system in dentistry.
5. Dental Hand pieces and the air/water syringe.
6. Fibre Optic Lights
7. Operation of auxiliary equipment including X-ray unit chemicals
8. Weekly maintenance
9. Ordering of replacement instruments, supplies and equipment.
10. Packing of equipment.

2- Dental prosthesis ergonomics

DPR353: Orthodontic and Pedodontics Prosthetics

Content:

- Treatment planning for partial dentures
- Principles of partial denture fabrication
- Components of partial dentures
- Partial denture design
- Clinical stages for partial denture
- Overdentures

DPR354: Complete Dentures

Content:

- Treatment planning;
- Principles of complete denture prosthodontics;
- Recording the occlusion for complete dentures;
- Trial insertion of complete dentures;
- Fitting complete dentures;
- Denture maintenance;
- Cleaning dentures;
- Denture problems and complaints.

DPR355: Orthodontic Appliance Construction

Content:

Definition,

- Types of Orthodontics Appliance
- Removable Appliance
- Functional Appliance
- Fixed Appliance

Component of removable Appliance

- Active component and types
- Retentive component and types
- Anchorage and types
- Baseplate and types

Type of case and indication

DPR356: Clinical Internship III

- **Clinical Internship III**

DPR357: Research and Biostatistics

- **Introduction to Research**

Objective: At the completion of this course, students should be able to:

- Understand the concepts of research in the biomedical sciences and be able to apply them
- Be able to accurately describe the fundamental concepts and approaches in qualitative and quantitative research methodology.
- Be able to find and appraise the available research literature through the use of valid resources, and thereby provide informed opinion.
- Be able to raise research questions in professional practice and apply appropriate research methodology to investigate and solve the research questions.
- Write a research proposal for approval by the Ethics Committee.
- Understand the role of bias and confounding and how to control for these in selection of study design.
- Appreciate the role of chance/random error, and the appropriate choice and application of statistical testing to assess this.
- Demonstrate the skills and knowledge required for independent or group research.

Content:

Introduction to research: Meaning and objectives of research; definition and Significance of health research, importance of research methodology for health science students.

Scientific research: Definition; C**haracteristic of scientific research:** Purposiveness, Rigor, testability, reliability, validity, replicability, precision, generalizability, objectivity); **Dimensions of scientific research** (concepts, theories, deductive & inductive reasoning, empiricism, variables, hypothesis, propositions **Elements of the Scientific Method**: Empirical Approach, Observation, Question, Hypotheses, Experiments, Analysis, Conclusion, and Replication

Scientific research process:

Categories of Research: Empirical and theoretical research, Basic and applied, Descriptive vs Analytical Research, Quantitative vs Qualitative Research, Conceptual vs Empirical Research, Etc.

- **Biostatistics I**

Objective: To summarize, analyze, present and interpret health statistical information.

Content:

Mathematics

- Percentages, rates, proportions, simple and compound interest, discount
- The electronic calculator

Basic Algebra

- Algebraic expressions
- Functions
- Linear and Simultaneous Equations
- Graphs of Functions
- Quadratic Equations

- Arithmetic and Geometric progressions

Biostatistics

- Introduction
- Basic concepts in biostatistics
- Sampling techniques and data collection
- Variables (Qualitative and Quantitative)
- Presentation of data: Frequency and frequency distribution, bar charts, Histograms, pie charts etc.
- Summarization of qualitative and quantitative data: mean, median, standard deviations and standard errors.

Biostatistics II

Content

- The concept and Principles of Significant tests and confidence intervals
- Statistical testing and inference: The normal distribution and t-distribution, Chi squared test, Poison distribution, non-parametric tests etc.
- Errors in statistics

DPR361: Epidemiology, Prophylaxis and Vaccination

Definition:

Incidence, prevalence, morbidity, lethality, contagiousness, attack rate, warning threshold, primary and secondary warning.

Epidemiological tripod

Epidemics, endemo epidemics, pandemics, demographic notions.

Prophylaxis

- Definition, prophylactic measures, systemic reporting, early screening, isololation, quarantine, rat extermination, desensitization, molluse control.
- Disposal of waste water and human and animal refuse.
- Physical, chemical, and radioactive pollution control; chemo-prophylaxis.

Immunization

- Definition, classification,
- Expanded program on immunization: origin, target population;
- Immunization strategies; Management of immunization activities.
- Planning, organization, supervision, evaluation of immunization coverage;
- Procurement and storage of vaccines,
- Monitoring of immunized population and IEC,
- Cameroon vaccination schedule: New-born, pre-school age, adults.

DPR362: Restorative Dentistry

- **Restorative Dentistry**

Content:

- What Is Restorative Dentistry?
- Types of Dental Restoration
  - **Direct.**
  - **Indirect.**
- Dental Restoration Costs and Insurance
- Diagnostic and communication concepts
- Principles of tooth preparation
- Composite resins
- Ceramic materials
- The impression process
- Contemporary adhesive cements
- Esthetic post systems
- Finishing and polishing esthetic
- Restorative materials
- Dental photography
- Periodontal plastic surgery
- Interdisciplinary implantology
- Biomodification of tooth discoloration

DPR363: Dental Radiology

Content:

- Basic principles of x-ray generation and image production.
- Patient management, Intraoral radiographic technique
- Radiation protection. Accessory radiographic techniques, darkroom.
- Film mounting and normal radiographic anatomy.
- Radiographic interpretation.

DPR364: Oral and Dental Surgery

Content:

- Scope and objectives
- Principles of surgery, History and examination
- Aseptic techniques
- Inflammation Repair and infection, the armamentarium
- Principles of teeth extraction and flap operation.
- Multiple extraction, Complication to exodontias and transplant.
- Surgical correction of bony anomalies
- The maxillary sinus, Cyst of the oral cavity
- Salivary glands: anatomy, development and diseases
- The Temporomandibular joint disorders (TMJ).

DPR365: Removable Partial Dentures

Content:

- The basic objectives of prosthodontics treatment
- Consequences of tooth lost
- Classification of partially edentulous arches
- Requirement of an acceptable method of classification
- Designing bracing and stability
- How to counteract lateral shifting
- Components of RPDs
- Mandibular labial bar
- Complete palatal coverage
- Rests and rest seats
- Denture base

DPR366: Clinical Internship IV

DPR367: Professional Ethics and Déontology

Professional Ethics &Deontology

Objective: At the end of the course, the student should be able to know those values and obligations which practice in the profession.

Content: Nurse, Patient, nurse/patient relationship, obligations of the nurse, rights of the patient, rights and responsibilities of the nurse, deontology, ethics, etiquettes, patient reception in hospital, nurse/patient-relative relationship. Medical jurisprudence, lab practice and the law, forensic nursing, malpractice, civic duties, organization of Government, Common law, labour law, Criminal Law,etc.

Health care Ethics

- Morality and Ethics: Norms, Deviances, Religion, Values, Beliefs, Cultures
- Bioethics
- MLS Ethics
- Moral Development
- Ethical Principles: Autonomy, Freedom, Privacy, Confidentiality, Beneficence, Fidelity, Motivation, Justice, Veracity and Responsibility.
- Code of Ethics health workers.
- Application of Ethics to MLS Practice: Respect For Life And Death, The Concept Of Dignity, Euthanasia, Human Rights, Rights of The Child, Rights of The Elderly, Patients Rights
- Ethical Decision Making Frameworks and their Application in diagnosis
- Context And Conflicts With Bioethical Standards

Patient Rights:

- Respect for life and death, the concept of dignity, euthanasia
- Care for dying patients: Palliative care, Confidentiality, Professional secrecy, Medical Research and Nursing care ethics.
- Code of ethics.
- Health Employee/employer contract law for health practitioners
- MLS and the law

Introduction to Law and Fundamental Rights

Law

- Sources of law
- Law and enabling Acts (text of application)
- The concept of legal personality
- Civil responsibility (contract, TORT)
- Criminal responsibility
- The court and their jurisdictions
- Labor law: formation and execution of labor contract, remuneration, condition of work, obligation of the employer and employee, termination of labor contracts

Fundamental Rights

- The concepts of human rights
- Sources of human right
- Major international conventions of human rights
- International conventions relating to women
- Children and the rights of the minorities
- The role of the judiciary and the legislative in the protection of human rights
- The Cameroon national commission of human rights and liberties
- The civil society NGO's and the protection of human rights

Law for Medical laboratory personnel

- Definition of Law, public law, private law
- The client's and MLS personnel's' constitutional right
- Administrative law related to licensing and regulation of health practice

Field : MEDICAL AND BIOMEDICAL SCIENCES

Specialty :

MIDWIFERY

Field:	MEDICAL AND BIOMEDICAL SCIENCES

Specialty:	Midwifery

1. Objective of the training

The HND specialty Midwifery aims to train of occupational health with a mission to accompany the pregnant women throughout their pregnancy, the establishment of the diagnosis until the day of the delivery, to animate the sessions of preparation for childbirth and ensure only the childbirth, to deal with the new-born and if necessary to perform the gestures of resuscitation and monitor the recovery of the mother. The midwife ensures the gynecological of women (prescription and install contraceptives, perineal reduction and drug IVG).

2. Research Skills

→ **Generic skills**

- Be responsible, reflexive and relational ;
- Have adequate gestures and capacities;
- Develop adequate interpersonal and intrapersonal skills to be able to interact effectively with their patients, entourage and the health team
- Should be trustworthy and reliable;
- Have the capacity for critical thinking, analysis and questioning;
- Develop ethical values of a normal professional;
- Make thoughtful and informed decisions;
- Be able to act with autonomy and responsibility in his area ofcompetence.
- Master the computer tool and ICT

→ **Specific Skills**

- Ensure the family planning with women wishing to maternity leave;
- Driving a prenatal consultation;
- Organize and facilitate a collective meeting in preparation for the birth and the kinship;
- Ensure an emergency consultation for abdominal pain during the 3rd quarter of pregnancy;
- Take charge of the pregnancy as soon as the design up to the issuance and after childbirth;
- Diagnose and monitor the work, achieve the birth and monitor its suites;
- Diagnose and take charge of the hemorrhage of the grant (beyond the immediate posPHartum period);
- Practice the clinical examination of the mother and of the new-born;
- Achieve a consultation of contraception and gynecological and prevention;
- To achieve a neonatal resuscitation of the new-born.

3. Outlets

- Public Service;
- Private hospitals and clinics;
- NGO (Non-Governmental Organizations);
- Self-employment;
- The agri-food sector;
- Occupational Medicine;
- Research and Training;
- PMI.

4. Organization of the Teachings

Semester 1

Field : Medical and Biomedical Sciences		**Specialty:Midwifery**					
CODE	**Courses titles**	**Hourly Volume**					**Number Of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
MID111	Anatomy physiology 1 - Embryology - Biology of Reproduction	55	17	4	14	90	6
MID112	Childcare - Nutrition - Dietetics	30	6		9	45	3
Professional Courses60% (4 UC) 18 credits 270 hours							
MID113	History of the profession of midwifery - Ethics and Professional Conduct health - Basic nursing	55	17	4	14	90	6
MID114	Professional legislation - national health system / Health Policy - Microbiology	30	6		9	45	3
MID115	General pharmacology - Hematology - General Pathology	55	17	4	14	90	6
MID116	Psychology-sociology - Education for Health - Prevention of Infections	30	6		9	45	3
Transversals Courses 10% (1 UC) 3 credits 45 hours							
MID117	Methods of work - Official Language 1 - Techniques of Information and Communication 1	30	6		9	45	3
Total		**285**	**75**	**12**	**78**	**450**	**30**

Semester 2

Field : Medical and Biomedical Sciences		Specialty:Midwifery					
Code	Courses titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
MID121	Anatomy and Physiology 2 - Semiology - Special pharmacology	55	17	4	14	90	6
MID122	Laboratory Techniques - Biochemistry - Parasitology/Mycology	30	6		9	45	3
Professional Courses 60% (4 UC) 18 credits 270 hours							
MID123	Pregnancy /prenatal monitoring-childbirth in Summit Presentation - Follow-up post natal	40	9		11	60	4
MID124	Communication for development-education for family life -basic care at birth/neonatology	30	6		9	45	3
MID125	Primary Health Care - Nursing/midwifery neonatal/base - hygiene and sanitation/First Aid	50	12		13	75	5
MID126	Clinical Internship 1			90		90	6
Transversals Courses 10% (1 UC) 3 credits 45 hours							
MID127	Approach to Care - Kind - Human Rights	30	6		9	45	3
Total		**235**	**56**	**94**	**65**	**450**	**30**

Semester 3

Field : Medical and Biomedical Sciences		Specialty:Midwifery					
Code	Courses titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
MID231	Other varieties of childbirth	20	5	0	5	30	2
MID232	Dystocia - obstetric pathologies - obstetric complications	66	21	3	15	105	7
Professional Courses 60% (4UC) 18 credits 270 hours							
MID233	Methods of Research -Statistics - Advanced Nursing	40	9	0	11	60	4
MID234	Epidemiology- Demography-community health	30	6	0	9	45	3
MID235	Pediatrics - Vaccination - Advanced techniques in Obstetrics	50	12	0	13	75	5
MID236	Community Practicum	0	0	90	0	90	6
Transversals Courses 10% (1 UC) 3 credits 45 hours							
MID237	Medical English/medical French 1- Techniques of Information and Communication 2	24	12	0	9	45	3
Total		**230**	**65**	**93**	**62**	**450**	**30**

Semester 4

Field : Medical And Biomedical Sciences		Specialty: Midwifery					
Code	Courses titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 uc) 9 credits 135 hours							
MID241	Gynecology - Obstetrical Care	40	10	0	10	60	4
MID242	Pediatrics/neonatology/pathologies new-born - gynecological pathologies	46	16	3	10	75	5
Professional courses 60% (4 uc) 18 credits 270 hours							
MID243	Analgesic in Obstetrics - Communication	40	10	0	10	60	4
MID244	PTME - AIDS/IST	40	10	0	10	60	4
MID245	Obstetrical pathologies	35	13	4	8	60	4
MID246	Clinical Internship 2	0	0	90	0	90	6
Transversals Courses 10% (1 UC) 3 credits 45 hours							
MID247	Family planning, initiation to research	26	11	3	5	45	3
Total		**227**	**70**	**100**	**53**	**450**	**30**

Semester 5

Field : Medical and Biomedical Sciences		Specialty:Midwifery					
CODE	Courses titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
MID351	Anthropology - reproductive health and sexual law - Toxicology	40	9	0	11	60	4
MID352	Anesthesia - Resuscitation - Infertility/Infertility	50	12	0	13	75	5
Professional Courses 60% (4 UC) 18 credits 270 hours							
MID353	Pregnancy Association and pathology PEG	50	5	0	5	60	4
MID354	Gynecology and gynecological pathologies	10	2	0	3	15	1
MID355	Emergencies obstetric and neonatal	10	2	0	3	15	1
MID356	Put in the situation maternity - Community Practicum	0	0	180	0	180	12
Transversals Courses 10% (1 UC) 3 credits 45 hours							
MID357	Civic education and ethics - Official Language	30	7	0	8	45	3
Total		**190**	**37**	**180**	**43**	**450**	**30**

Semester 6

Field : Medical and Biomedical Sciences		**Specialty:Midwifery**					
CODE	**Courses titles**	**Hourly Volume**					**Number Of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
MID361	Gerontology/geriatrics + IEC 3 - Administrative Writing - Psychiatry/Psychopathology	50	18	3	13	90	6
MID362	Medical imaging - Quality Assurance - Entrepreneurship	30	6	0	9	45	3
Professional Courses60% (4 UC) 18 credits 270 hours							
MID363	The economics of health - Drafting of memory	30	7	0	8	45	3
MID364	Imci	30	6	0	9	45	3
MID365	Follow-up to the work and obstetrical maneuver	20	5	0	5	30	2
MID366	Internship (MSP maternity) - Internship (MSP pediatrics)	0	0	150	0	150	10
Common Courses 10% (1 UC) 3 credits 45 hours							
MID367	Professional Ethics and Deontology - ICT	30	7	0	8	45	3
Total		**196**	**49**	**153**	**52**	**450**	**30**

5. Courses content

MID111: Anatomy physiology 1 - Embryology - Biology of Reproduction

- **Anatomy Physiology -1: 3 credits (45 hours); L, T, P, SPW**

1. Nervous System

- The organization of the nervous system: central nervous system, periPWral nervous system, autonomic nervous system (the systems parasympathetic and sympathetic);
- The structure of the nervous tissue;
- The nerve endings; - the operation of neurons; - the reflexes.

2. The Endocrine System

- The hormones;
- Thyroid and parathyroid glands;
- The pituitary and hypothalamus;
- The adrenal glands;
- The pancreas.

3. Organ of meaning

- The eye: the view;
- The ear: hearing and balance;
- The sense of smell;
- The taste;
- The touch.

- **Embryology: 1 credit (15 hours); L, T, P, SPW**
  - Fertilization unto implantation of clavage unto the training of the blastocysts;
  - Development of the trophctoderm (syncitio and cytotrophoblast, gaps and chorionic villus sampling primary, secretion of HCG), the inner cell mass (training of the endodermis primitive and of the epiblast) and the umbilical vesicle (parietal endoderm and yolk sac secondary);
  - Formation of the primitive line;
  - Training of primordial slips: endodermis unto mesoderm - neural plate or neurectoderme;
  - Cerebral growth-caudal fin;
  - Evolution of the mesoderm: formation of blood vessels - the allantois;
  - Evolution of the villus choriale;
  - The channels of Müller and Wolf;
  - Evolution and Fate of embryonic slips: endodermis, mesoderm and ectoderm;
  - Sex determination.

- **Biology of Reproduction: 1 credit (15 hours); L, T, P, SPW**

1. Define the concepts of gene, allele, dominance, recessiveness, codominance, PWnotype, genotype, mutation, deletion
2. Location of the genetic information
3. Structure of DNA
4. Transmission of genetic information in the course of the cellular division
5. The expression of genetic information in the cell
6. Organization Organs protectors of gametes: testis and ovary (annotated diagram)
7. The meiosis
8. The oogenesis
9. The spermatogenesis
10. The fertilization
11. Early embryonic development and implantation.

MID112: Childcare - Nutrition - Dietetics

- **Child care: 1 credit (15 hours); L, T, P, SPW**

1. Definition and goals of childcare
2. Physiology of the new-born
3. Assessment of the state of health of the new-born
4. Welcome and review of the new-born
5. Daily pec of the Child
6. Accompanying the parents
7. Monitoring of the growth of the Child: staturo curve-weight
8. Monitoring the development of the Child: awakening psycho-emotional
9. Immunization of the new-born and child: vaccination schedule
10. Supply of the new-born: breastfeeding and artificial
11. Milk and dairy products
12. The nutritional needs
13. Baby food

- **Nutrition: 1 credit (15 hours); L, T, SPW**

1. **Knowledge of the food**
   - Definition of concepts related to the Nutrition: Nutrition, food, nutrients, dietetics, metabolism, synthesis, nutritional needs, and food ration;
   - Classification of foods.
2. **Nutritional Needs**
   - Nutrients and their role;
   - Nutritious principles;
   - Daily Intakes recommended on the basis of the factors that influence (age, sex, physiological state namely pregnancy, breastfeeding, etc., physical activity and pathological state);

- Types of needs of the organization;
- Relationship food (balanced diet, varied diet).

3. **Assessment of the Nutritional Status**
   - Techniques for the assessment of nutritional status;
   - Assessment of the nutritional status of an individual and a community;
   - Definition of the monitoring of the growth;
   - Construction of a curve of growth;
   - Main indicators of nutritional status;
   - Analysis and interpretation of data collected on the nutritional status.
4. **Nutritional pathologies**
   - Different nutritional pathologies;
   - Classification of pathologies by deficiency, by excess and by disorders of the behavior;
   - Sign, symptom and diagnostics means clinical and biological;
   - Measure of prevention and treatment (make reference to the national programs implementation in Cameroon in the field).
5. **Essential actions in Nutrition**
   - What is the essential actions in nutrition (NEA);
   - What are the NEA;
   - Optimum breastfeeding during the first six months of life:
     - Supplementary feeding optimal at from six months and continuation of the maternal supply up to the age of two years and beyond;
     - Optimum Power for sick children and those severely malnourished
     - Prevention of vitamin A, anemia and iodine deficiency;
     - Optimal nutrition of pregnant women, lactating women and HIV/AIDS.
6. **Sanitary Safety of Food**
   - Personal hygiene, environmental and food;
   - Quality of foodstuffs;
   - Legal framework applicable to foodstuffs.

➢ **Dietetics : 1 credit (15 hours); L, T, P, SPW**

1. Food for future parents: Example: choice of the sex for him-for it
2. Power supply for Pregnant Woman: needs, vitamin and mineral supplements, food and products to avoid, increase of the consumption of certain foods depending on the case.
3. Power supply for breastfeeding women
4. Malnutrition and nutrition
5. Metabolic Diseases and Nutrition
6. Food Allergies and nutrition - Parenteral and enteral feeding
7. Various childhood regimes depending on the case

MID113: History of the profession of midwifery - Ethics and Professional Deontology health - Basic nursing

- **History of the profession of the Midwifery: 1 credit (15 hours) ; L, T, P, SPW**

1. Definition of the concepts of occupation and profession, profession of the Sage-Femme
2. The historyof the profession of the Sage-Femme
3. The Profession of Sage-Femmeen America, in Europe and in Africa
4. Special feature of the training in Cameroon
5. The skills of the Cameroonian Sage-Femme
6. The field of exercise of the Sage-Femme in Cameroon
7. The exercises in the profession of the Sage-Femme: The quality approach
8. The role, the function of the Cameroonian Sage-Femme
9. The qualifications of the Sage-Femme/ care in obstetrics
10. The concept of professional responsibility: legal responsibility, field of the legal responsibility, criminal liability, civil liability, contractual responsibility
11. The profile of career and professional mobility of the Cameroonian Sage-Femme
12. The conditions for the exercises of the Sage-Femme in Cameroon: the normative framework (the Act)
13. The dynamic professional: the associations of the Sage-Femme, the order of the Sage-Femme.

- **Ethics and Professional Deontology: 1 credit (15 hours); L, T, P, SPW**

  - **Ethics**

1. Definition of concepts: the concept of the human person, ethical, moral, professional ethics, life, dead.
2. Human dignity, the dignity of the embryo
3. Concept of stigma and discrimination in the health care system in the context of HIV and other chronic conditions
4. The concept of value and value-system
5. The systems of values and the exercise professional: the Sage-Femme face at the request of the IVG, ethical considerations during the neonatal resuscitation, the ethical aspect of motor disabilities of brain origin; the active and passive euthanasia
6. The concepts of informed consent and confidentiality
7. Notion of coaching and palliative care
8. Medical developments, technological and regulation of practices
9. The test of the dilemmas as professional under
10. The professional conscience

- **Professional Ethics**

1. Definition of concepts;

2. The general duties of the Sage-Femme: duty vis-a-vis itself, of its brothers and sisters, of the other corps of the concept of professional misconduct.

- **Basic nursing: 4 credit (45 hours); L, T, P, SPW**

1. Definition of concepts in Nursing
2. Prior to any care: before the care, during the care, after the care
3. The folder of care
4. The House of the patient
5. The rehabilitation of the bed
6. Prevention of pressure sores
7. Administration of Medication
8. Hygienic Care: toilet
9. Vital signs: TA, pulsation, T°, FR, etc.
10. The prenatal consultation; BDCF, surveying, HU, CA, etc.
11. The techniques of parenteral injections: IM, IV, intravenous infusion, blood transfusion
12. The bandages
13. The dressings
14. Use of material of Care: Pool bed, urinal, bladder of ice, bouillotte, spittoon, thermometer, device to TA, scales, spacer, meter ribbon.

MID114: professional legislation - national health system / Health Policy – Microbiology

- **The professional legislation: 1 credit (15 hours); L, T, P, SPW**

1. Generality and fundamental principles (public law, private)
2. Concept on the courts in Cameroon
3. The legislation of work in the public and the private sector
4. The unions and associations (right to strike)
5. Concept on the contract for the travails and collective agreement
6. The sanctions in the Professional plan of the Council of the order of the professions of Nursing, Sage-Femme and Technicians medico-sanitary
7. Administrative acts: the declaration of pregnancy, the certificate of pregnancy, the declaration of birth

- **National System of Health / Health Policy: 1 credit (15 hours); L, T, P, SPW**

1. Definition of concepts: health system, health policy
2. Schematic representation of a health system
3. History and evolution of health systems in Cameroon
4. Description of the national health system in Cameroon: concept on the decisions of the conferences of Lusaka and Bamako, basic elements of the reorientation primary health care, health pyramid and its components, the national health system in Cameroon with the unit of integration,

principles of care as defined by the reo. S.S.P, structure of the health district with its minimum package of activities, concept of role, concept of the financing and management of activities, concept on the recovery of costs, concept on the essential drugs and generic, concept is based on the document a sectoral strategy Health , basic concept on the strategy paper for growth and employment, basic concept on the Poverty Reduction Strategy Paper, a concept on the Millennium Development Goals (MDGS), a concept on social inequality, the servicing of the health district: steps, a concept on the priority program of health in Cameroon: justification of a health program, components of a program, Determinants The success Of health programs.

- **Microbiology: 1 credit (15 hours); L, T, P, SPW**

1. **Introduction to the microbiology**
   - History (work of Louis Pasteur and concept of the disease);
   - Definition of Microbiology;
   - Different branches of the microbiology (bacteriology, parasitology, mycology, virology).
2. **General Bacteriology/virology: Bacteria**
   - General Concept on the bacteria (definition and generality, bacterial structure);
   - Bacterial physiology;
   - Antigenic Constitution of the bacteria;
   - Bacterial nutrition;
   - Growth of bacteria ;
   - Respiratory mode (aerobic, anaerobic, fermentation);
   - Host relationship bacteria;
   - Classification of bacteria depending on the relationship with the Host: symbiotic bacteria, commensal, pathogens (Specific, opportunistic);
   - Mode of transmission;
   - Concept of pathogen and pathogenicity: virulence, toxin production;
   - Host Defense Mechanism (agency) against the bacteria: natural immunity, immunity artificial or gained;
   - Concept on the classification of bacteria (depending on the form, identities based dyes, according Prévot).
3. **The virus: the virus definition - Viral structure - classification of viruses**
4. **Means of fight against microorganisms:** asepsis unto antisepsis unto disinfectant sterilization unto unto concepts on antibiotics (definition and classification).

MID115: General Pharmacology - Hematology - General Pathology

- **General Pharmacology: 1 credit (15 hours); L, T, P, SPW**

1. Definition of the concepts of the Pharmacology: medication, active principle, excipients, pharmacodynamics, pharmacokinetics, pharmacovigilance, drug dependence, pharmacogenetics, concept of target, carrier, adverse effect.
2. Definition and Origin of the drugs
3. Different types of molecules used in therapy
4. The different forms of the drug
5. The risks of the drug (adverse reactions, drug interactions, drug dependence)
6. Drug Nomenclature
7. Order and rule of prescription of drugs (types of orders, classification of medicines, drugs listed, drugs not listed, the right of substitution)
8. Prescription in specific populations: the renal impairment, the pregnant woman, the child, the elderly person
9. Self-medication and dangers of drugs
10. Molecular mechanism of action of drugs
    - Concept of pharmacological target (Membrane receptors and intracellular, carriers, ionic channels);
    - Classification of medicines in function of their target;
    - Physiological reminder and classification of different types of membrane receptors.
11. Pharmacological analysis of the interaction between a drug and its target
    - Concept of affinity and of activity - Types of Interaction (agonist, antagonist, partial agonists, inverse agonists);
    - Establishment of the pharmacological profile of a drug;
    - Concept of desensitization, hypersensitivity, dependence, tolerance;
    - Concept of interaction between drug and ionic channels voltage-dependent (dissociation kinetics).
12. Pharmacokinetics and metabolism of drugs
    - Definition and Purpose of the pharmacokinetics;
    - Steps of the pharmacokinetics of a drug (ADME);
    - Mode of administration of the drugs (Advantage and disadvantage of each track);
    - Influence physiological and pathophysiological on the pharmacokinetics of drugs.
13. Concepts of Pharmacodynamics
    - Definition and Purpose of the pharmacodynamics;
    - Concept of therapeutic margin;
    - Dosage adjustment: choice of the best dose;
14. Therapeutic risk during pregnancy and lactation.

- **Haematology: 1 credit (15 hours); L, T, P, SPW**
  1. Introduction to the Hematology and immunohematology: Definition and General Information
  2. Concept on the blood: definition, composition
  3. The figurative elements of the blood
     - The erythrocytes: origin (according to erythropoiesis), numeration, morphology, biochemical composition and enzymatic, physiology, role in the organization;
     - Leukocytes: origin (according granulopoïèse), numeration, morphology, classification, physiology, role;
     - Platelets: origin (according thrombopoïèse), numeration, morphology, physiology, role, hemostasis and coagulation.
  4. Immunohematology: the blood groups in the ABO system, in the Rhesus system, intérêTHe their determination
  5. Pathology of the blood and anomalies
     - Erythrocyte pathology: anemia, polycythemia, sickle cell anemia;
     - Granulo pathologies monocytic-: Neutropenia, polynucléose, eoNUSophilia, leukemia acute myeloid;
     - Lymphoid pathologies: Lymphoid leukemia Acute and chronic, anomalies (lymphopénies) during the course of the HIV infection;
     - Platelet pathologies: thrombocytopenia, anomalies of hemostasis and coagulation, haemophilia.
  6. Methods of exploration/means of biological diagnosis
     - Blood Count (NFS) or CBC;
     - Rate of hémoglobineŔHématocrite -speed of sedimentation (VS);
     - Bleeding time (TS) and of coagulation (TC);
     - Test of Emmel and electrophoresis of hemoglobin;
     - Determination of blood groups -Compatibility Test (cross match).

- **General Pathology: 4 appropriations (60 hours); L, T, P, SPW**
  1. **Pathologies medico-surgical procedures of the digestive tract**
     - Definition of concepts;
     - Pathophysiology;
     - Etiology;
     - Semiology : Symptom and clinical signs;
     - Paraclinical examinations;
     - Positive diagnosis and differential;
     - Evolution and complications;
     - Treatment: medical, surgical, preventive;
     - Role of the Sage-Femme / care in obstetrics.
  2. **Bacterial diseases**
     - Definition of concepts;

- Epidemiology (etiology: causal agent and Factors Favoring/mode of transmission);
- Semiology: symptoms and clinical sign;
- Biological examinations;
- Positive diagnosis and differential;
- Evolution and complications;
- Curative treatment and preventive measure;
- Role of the Sage-Femme/ care in obstetrics.

3. Cardiovascular diseases

- Definition of concepts;
- Epidemiology (etiology: causal agent and Factors Favoring/mode of transmission);
- Pathophysiology;
- Semiology: symptoms and clinical sign;
- Paraclinical examinations;
- Different clinical forms;
- Positive diagnosis and differential;
- Evolution and complications;
- Curative treatment and preventive measure;
- Role of the Sage-Femme/ care in obstetrics.

4. The pathologies of the blood

- Definition of concepts;
- Epidemiology (etiology: causal agent and Factors Favoring/mode of transmission);
- Pathophysiology;
- Semiology: symptoms and clinical sign;
- Paraclinical examinations;
- Different clinical forms;
- Positive diagnosis and differential;
- Evolution and complications;
- Conduct;
- Curative treatment and preventive measure;
- Role of the Sage-Femme/ care in obstetrics.

5. Pathology endocrine Medical

- Definition of concepts;
- Epidemiology (etiology : causal agent and Factors Favoring/mode of transmission);
- Factors favoring;
- Pathophysiology;
- Semiology: symptoms and clinical sign;
- Paraclinical examinations;
- Different clinical forms;
- Positive diagnosis and differential;

- Evolution and complications;
- Conduct - curative treatment and preventive measure; - Role of the Sage-Femme/ care in obstetrics.

6. Surgical pathologies of the Musculoskeletal System

- Definition of concepts;
- Epidemiology (etiology : causal agent and Factors Favoring/mode of transmission);
- Semiology: symptoms and clinical sign;
- Paraclinical examinations;
- Positive diagnosis and differential;
- Evolution and complications;
- Curative treatment and preventive measure;
- The role of the Midwife/ care in obstetrics.

7. Viral diseases

- Definition of concepts;
- Epidemiology (etiology: causal agent and Factors Favoring/mode of transmission);
- Semiology: symptoms and clinical sign;
- Phase: incubation, invasion, state;
- Positive diagnosis and differential;
- Biological review;
- Evolution and complications;
- Curative treatment and preventive measure;
- Role of the Sage-Femme/Maieutician;

8. Pathologies medico-surgical procedures of the Genitourinary System

- Definition of concepts;
- Pathophysiology ;
- Etiology: causal agent and Factors Favoring/mode of transmission);
- Semiology: symptoms and clinical sign;
- Paraclinical examinations - positive diagnosis and differential;
- Evolution and complications;
- Curative treatment and preventive measure;
- Role of the Sage-Femme/Maieutician.

9. Parasitic Diseases

- Definition of concepts;
- Epidemiology (etiology: causal agent, agents vector, the host, the evolutionary cycle and the factors favoring/mode of transmission);
- Semiology: symptoms and clinical sign ;
- Positive diagnosis and differential;
- Biological review;
- Evolution and complications;
- Curative treatment and preventive measure;

- Role of the Sage-Femme/ care in obstetrics.

10. Pathologies broncho-pulmonary

- Definition of concepts;
- Etiology: causalet agent the factors favoring/mode of transmission);
- Pathophysiology;
- Semiology: symptoms and clinical sign;
- Positive diagnosis and differential;
- The different clinical forms;
- Evolution and complications;
- Curative treatment and preventive measure;
- Role of the Sage-Femme/Maieutician.

11. Surgical pathologies of the skin and underlying tissues

- Definition of concepts;
- Etiology: causal agent and the factors favoring/mode of transmission)
- Pathophysiology;
- Semiology: symptoms and clinical sign;
- Positive diagnosis and differential;
- Paraclinical examinations;
- Evolution and complications;
- Curative treatment and preventive measure; - Role of the Sage-Femme/Maieutician.

MID116: Psychology-sociology - Education for Health - Prevention of Infections

- **Psychology-sociology: 1 credit (15 hours); L, T, P, SPW**

1. Generality: definition of psychology, sociology and anthropology
2. Evolution of the man in its cultural environment: cultural phenomenon in link with the fertility, birth, maternity, cultural attitudes to the illness, death and bereavement
3. The main mechanisms of defense: mounting, regression, refoulement, sublimation, projection, displacement, rationalization
4. Relationship between midwifery and women/children: asymmetric relationship, emphatic relationship, conflictual relationship
5. The Physiological factors of the good home and impact in patients

- **Education for Health: 1 credit (15 hours); L, T, P, SPW**

1. Context and Problem of education for the health
2. Definition of certain general concepts related to education for health
3. The communication process
   - The barriers to communication;
   - The channels of communications;
   - The principles of good communication;

- Types of communication.

4. Techniques and strategies of communication
5. Objectives, goals and priorities of the Education for the health
6. Basic principles, levels of intervention of the communication
7. Methods: presentations, meetings, role play, case study, demonstration, etc. their classification, criteria of choice
8. Means used in education for health: their classification, criteria of choice
9. Group Dynamics: JOHARI Window
10. Organization of an educational talk and its stages
11. Organization of a home visit is its steps
12. Layout of Tables during the sessions of the animation.

- **Prevention of Infections: 1 credit (15 hours) ; L, T, P, PW**
    1. Definition of concepts: host, germ, tank, transmission, nosocomial infection;
    2. Mechanism of nosocomial infections: infectious agents involved, modes of transmission and risk factors, types of risks linked to the sick and to care, location of nosocomial infections
    3. Prevention of nosocomial infections
    4. Standard precautions: hygiene of hands, techniques of hand washing, personal protective equipment
    5. Measure In the event of an accident of exposure to blood
    6. Additional precautions: insulation
    7. Maintenance of the environment: waste management, hygiene of the premises, and treatment of medical devices: Decontamination, Sterilization, disinfection, antisepsis.

MID117: Methods of work -Bilingual training 1 - Techniques of Information and Communication 1

- **Method of work: 1 credit (15 hours); L, T, P, SPW**
    1. Definition of concepts: Method, methodology, will, intelligence, knowledge, namely, organization, ability, memory, concentration
    2. Symptom of a poor organization - the organization of the office
    3. The management of the time - Synthesis and note taking
    4. Preparation of the body for optimal learning: the power supply, relaxation, rest, physical and psychical
    5. The organization of the work - the work environment
    6. Reading: typologies, the taking of notes
    7. Preparation for the review - the process of resolution of problems
- **Official Language 1: 1 credit (15 hours); L, T, P, PW**

1. Grammar (identification for different partof speech, construction of tenses concords)
2. Anatomy (naming of body parts especially the reproductive system)
3. Construction of medical terms (medical terminology including priority health program, and their nomenclature in both language)
4. Translation of documents
5. Description of the health structure and component in both language
   - Naming of instruments used in the hospital;
   - Identification of personnel in the hospital (categories);
   - Units and departments of the hospital.

➢ **Techniques of Information and Communication 1: 1 credit (15 hours); L, T, P, SPW**

1. Concepts and architecture of computers
2. Definitions: computing, information, computer, data, program, software, drivers
3. System of enumeration of base 2, the unit of measure of the information and its multiple
4. Components of the computer (hardware and software)
5. Study of an operating system
6. Study of a text treatment software: Microsoft Word
7. Study of a spreadsheet/Microsoft Excel
8. Study of a presentation software: Microsoft PowerPoint

MID121: Anatomy and physiology 2 - Semiology - Special pharmacology

➢ **Anatomy physiology 2: 4 appropriations (60 hours); L, T, P, SPW**

1. **Cardiovascular system (1 Credit)**
   - The heart;
   - The general circulation;
   - The different parts of the circulatory system (arteries, system door, the veins, the pulmonary circulation);
   - Verification of the effectiveness of the Movement: blood pressure, pulse.
2. **The respiratory system (0.5 credit)**
   - Descriptive anatomy and appliquéedes respiratory tract;
   - Mechanism of the ventilation.
   - The respiratory échangesgazeux;
   - Lesmodifications of the respiratory system during pregnancy.
3. **The digestive system (0.5 credit)**
   - Descriptive anatomy of the digestive system;
   - The bodies annexs to the digestion - The mechanism of digestion; - The Digestive changes during the course of thepregnancy.
4. **Urinary system (0,5crédit)**
   - Anatomy of the kidney;

- Schematic and functions of the various parts of the 2 types of nephron;
- Mechanism of production of urine (glomerular filtration, tubular reabsorption, tubular secretion);
- Anatomy and Physiology of the ureters of the bladder and the urethra ;
- Physiological changes of urinary system during the pregnancy.

5. **The genital system (0.5 credit)**
   - Anatomy of the genital system the masculine and the feminine and the glandesannexes;
   - Physiology of the semen: sperm analysis;
   - Physiology of the genital system masculine: spermatogenesis;
   - Physiology of the genital system female: oogenesis, ovarian cycle, hormonal regulation of the ovarian cycle, menstrual cycle, effects of estrogen and progesterone, the sexual response of the woman; - anatomy physiology of the breast.
6. **Osteology, Arthropologie and general Myology (1 credit)**
   - The OS and the skeleton;
   - The Joints - The musculature;
   - The basin at the woman.

➢ **Semiology: 1 credit (15 hours) ; L, T, P, SPW**

- Definition, etiology, sign and symptom of a few affection of:
  - The Respiratory System
  - The urinary tract
  - The circular device
  - The Digestive System
  - Nervous System
  - Sense Organs
  - Dermatology
  - Musculoskeletal Health
  - Genitourinary

➢ **Special pharmacology: 1 credit (15 hours); L, T, P, SPW**

1. The anti-infective drugs: Antibiotics, antituberculosis drugs, pesticides antivirals
2. The drugs in the central nervous system: analgesics, anaesthetics, antiepileptics, psychotropic drugs, the antiparkinsonian
3. The drugs in the vegetative nervous system: drugs of the sympathetic system and parasympathetic system
4. The drugs in the cardiovascular and renal: the antihypertensive agents, diuretics, normolipémiants, plasma and its fractions

5. The drugs in inflammation and tissue reactions: The antiinflammations, medicines of the gout, antihistamines
6. The medicines of the digestive system: drugs of the intestine, stomach, liver, bile, antiemetics, products of contrast used in digestive Radiology
7. The medicines of the respiratory: antitussives, expectorants, the respiratory analeptiques, medicines of asthma, the Asphyxiation
8. The hormonal drugs and vitamins: drugs of diabetes, peptide hormones and steroids, contraceptiques, vitamins
9. The drugs of coagulation disorders: anticoagulants, antiplatelet medicinal products, modifiers of fibrinolysis, hemostatic the
10. The drugs used during pregnancy, childbirth and breastfeeding.

MID122: Techniques in the laboratory - Biochemistry - Parasitology/Mycology

- **Laboratory Techniques: 1 credit (15 hours); L, T, P, SPW**

• Levy (variable depending on the areas of activities in the laboratory), collection and transmission of biological samples.

• Methods of essential basic biological diagnostic in:

- **Clinical Bacteriology:** examinations direct microscopic (State Fees and after staining of gram) of genital secretions, urinary, LCR, etc.
- **Haematology:** blood count (NFS), speed of sedimentation (VS), haemoglobin, hematocrit, test of Emmel, bleeding time (TS), activated clotting time (TC).
- Immuno-hematology: determination of blood groups (in the ABO system and RH), test of compatibility (pourprévenir accidents of the blood transfusion).
- **Clinical Biochemistry:**
  - Biochemical test quick (albumin, sugar, Ph, etc.);
  - Urinary biochemistry: Proteinuria, glucosuria, bile pigments, ketone bodies;
  - Biological diagnosis of pregnancy.

- **Parasitology/clinical Mycology**
  - Parasitic Coprologie KOAP"";
  - Blood Parasitology: drop thick, thin smears;
  - Parasitology cutanéo dermal-: skin biopsy exangue (ECB);
  - Parasitology genito-urinary tract: trichomonas, Schistosoma.
  - Mycology: review direct microscopic of mycological levies
- **Immuno-Serology:** VDRL, PHHA, Widal and Felix, ASLO, screening of HIV, HSV and chlamydia.
- Basic concept on the approach-quality, hygiene and safety in the laboratory.

- **Clinical Biochemistry: 1 credit (15 hours); L, T, P, SPW**
  1. Introduction to the biochemistry (general and clinical): definition and General Information
  2. Concept on the living matter
  3. Definition and chemical composition (water, organic molecules, elements minerals and oligo-elements, nucleic acids, enzymes)
  4. Biochemical constituents of biological fluids of the body
     - Urine: normal constituents and abnormal: proteins (albumin), carbohydrates (glucose), ketone bodies, salts and bile pigments, sediment and calculations, nitrogenous constituents (mineral ions, Na+, K+), blood, leukocytes;
     - Blood: fluid compartments (plasma, serum), proteins, (urea, creatinine, bilirubin), carbohydrate (glucose), mineral ions (Na+, K+), lipids (cholesterol, triglycerides), serum enzymes (AST, ALT, PAL, CAP, Gamma GT); □□The cerebrospinal fluid (CSF): protide, carbohydrate, cHCMoride.
  5. Physiological mechanisms of the major constituents or biochemical parameters
     - Carbohydrate: The oses (Classification), the structure and the properties of the glucose, the metabolism and the role of glucose;
     - Lipids: main groups, metabolism and the role of cholesterol and triglycerides;
     - Proteins: structure and classification, metabolism and the role of the protein.
  6. Metabolic pathologies: quote a few metabolic pathologies
  7. Biological examinations or means of biological diagnosis)
     - Qualitative test: (biochemical test fast for research in the urine:
     - Albumin, sugar, keto body, pigments and bile salts and for the diagnosis biology of the pregnancy);
     - Assay (quantitative test) in the blood: glucose (blood glucose), urea, creatinine, bilirubin, transaminases, cholesterol, triglycerides, ions minerals (ionogramme) and in the CSF.
- **Parasitology/Mycology: 1 credit (15 hours); L, T, P, SPW**
  1. Introduction to the parasitology and mycology: Definition and General Information
  2. Parasites of medical interest: general notions on the parasites (definition: parasite and parasitism, classification: nomenclature and systematic (taxonomy) of human parasites classified into four group: Protozoa: sporozoaire or coccidia, rhizopods, flagellates, ciliates. The helminthias : némathelminthes: classes of nematodes oviparous and viviparous, Platyhelminthes: classes of trematodes and cestodes, arthropods (insects and mites vectors), mollusc, annelids, micromycètes (fungi):

Microscopic fungi:

- Epidemiology and parasitic cycle;
- Host-parasite relationship and pathogenicity;
- Means of pest control: community distribution of treatments and nets, anti-vector, health education, construction of wells and latrines, access to drinking water.

3. To quote a few parasitic diseases and their techniques for diagnosis:
   - Protozoa: anguines (malaria, toxoplasmosis, trypanosomiases), intestinal (amoebiasis, giardiasis, coccidioses), uro-genital trichomoniasis (uro-genital), dermal (cutaneous leishmaniasis);
   - Helminthias infections: intestinal (bilarziosis or schistosomiases, pinworms), hookworm, Trichuriasis, ascaridiose, teaniase, anguillulose, blood (filariasis), mucocutaneous (onchocerciasis), uro-genital (schistosomiasis or bilarzia) ;
   - Pathologies due to arthropods: Gale or scabiose (dermal dermatosis) due to a mite vector, Sarcoptes scabiei;
   - Pathologies due to micromycètes (microscopic fungi):
   - Fungal infections.
4. The fungi of medical interest
   - General concepts on the microscopic fungi (or fungi):
   - Definitions, generality (morphology, mode of reproduction and transmission, pathogenic role);
   - Classification of some fungal diseases (mycosis) and their microscopic fungi responsible: quote a few pathologies without developing the disease;
   - Mycosis dermatophyte or gastroenteric infections or dermatophytosis: Moth, onyxis of hands and feet, etc. fungi responsible: Trichophyton, Microsporum, Epidermophyton;
   - Mycosis to yeast or yeast infections: intertrigo to Candida or genital candidiasis, agent responsible for Candida albicans;
   - Other mycosis: mycosis or oral candidiasis: responsible agent Candida albicans, Mycosis to filamentous fungi contaminants aspergillosis (agent responsible Aspergillus fumigatus), Mycosis atypical or inclassées: Pneumocystoses (pathogen Pneumocystisjioveci formerly Pneumocystiscarinii).

MID123: Pregnancy/prenatal monitoring-childbirth in Summit Presentation - Follow-up post natal

- **Pregnancy: 1 credit (15 hours); L, T, P, SPW**

1. Physiological Reminder - Menstrual Cycle - Fertilization
2. The embryonic development and placental
   - Period of pre-implantation;
   - Period of post implantation;

- The circulatory system of the placenta;
- Cell differentiation;
- Leshormones of pregnancy.

3. The physiological changes of the maternal organism
   - Changes cardio-vascular disease;
   - Immune changes;
   - The changes of hemostasis;
   - Endocrine Changes;
   - Changes in the digestive system;
   - Respiratory changes;
   - Integumentary Changes - Changes hematological
   - Changes in the urinary system;
   - Modifications of the genital system.
4. The changes psychical and psychological
5. The positive diagnosis and differential of the pregnancy and the beginning: signs and manifestations of the pregnancy, interrogation and clinical examinations, complementary examinations Hygiene of the pregnancy: bodily hygiene, dress hygiene, food hygiene

- **The follow-up: Prenatal 1 credit (15 hours); L, T, P, SPW**
  1. Prenatal consultations refocused - Diagnostics of pregnancy
  2. Definition of prenatal care refocused
  3. The goals of the refocused prenatal -The components of prenatal care
  4. The objectives of the antenatal monitoring
  5. Pace of prenatal consultations
  6. First Consultation - Following Consultation
  7. Systematic bias - biological balance of the pregnancy
  8. Plan for the preparation of normal childbirth
  9. Review of a pregnant woman in the vicinity of the term.

- **Delivery in the presentation of the Summit: 1 credit (15 hours); L, T, P, SPW**
  1. Definition of the presentation of the Summit
  2. The different varieties of the presentation of the Summit (OIDA, OIGA, OIDP, OIGA, OP)
  3. The diagnosis of the presentation of the Summit - the differential diagnosis
  4. The delivery in the presentation of the summit, prior varieties, varieties after
  5. Description of the maneuver of Leopold
  6. Mechanism of the delivery in the presentation of the Summit: Synclitisme and Asynclitisme, commitment, expulsion, decent and rotation of the head in the birth of the Summit
  7. The practical conduct of the delivery in the summit presentation
  8. The issuance: spontaneous, GAPHA, artificial
- **Follow-up post natal: 1 credit (15 hours); L, T, P, SPW**
  1. Definition of the concept followed post natal

2. Classification of the period post natal
3. Monitoring post natal
4. Post-natal consultations
5. Surveillance in the delivery room
6. Monitoring of uterine involution
7. The risquesmaternels in post partum
8. Prevention and Screening of phlebitis
9. The lactation and monitoring, breast care
10. Education and counseling focused on potential problems
11. The suites of normal layers
12. Supervision and care in the suites of layers
13. The composition of foods for the mother and hygiene of the mother and baby
14. List of drugs that the mother must take or not take
15. Establishment of the list of vaccines for the baby
16. Physiology of the return of layers
17. Importance of breastfeeding intensive
18. Family planning in post partum

MID124: Communication for development-education for family life -basic care at birth/neonatology

- **Communication for Development: 1 credit (15 hours); L, T, P, SPW**

1. Definition of concepts: communication for development, planning, organization, direction, control and coordination
2. Principles of the communication and different applications
3. Why the approach to communication for development?
4. The objectives of the communication for development in Cameroon
5. Participatory Communication for Development
6. Process of change of behavior
7. The planning process of interventions in information education and communication - Design Phase: analysis of the situation, fault finding possible community
8. Techniques of approach to know the community
   - Data Collection - Analysis and interpretation of data;
   - Practical illustration of the analysis and interpretation of data;
   - Finding-analysis of the situation;
   - Identification of health problems and choice of priority problems;
   - Formulation and analysis of the priority problems in view of the determination of the causes and predisposing factors, facilitating and strengthening.
9. Formulation of objectives of the communication program
10. Communication Plan

- **Education for family life: 1 credit (15 hours); L, T, P, SPW**
  1. Definition of concepts: kinship responsible, family (family form, functions of the family: socialisation and procreation)
  2. Reminder anatomy and physiology of male and female
  3. Transformation associated with puberty
  4. Contraception
  5. Risk behaviors and high risk
  6. Consequence of Risk Behaviors
  7. Dimensions of the sexuality: biological, psychoaffectif social and
  8. Strategies for the prevention of STIS AND HIV and other deviant behavior
  9. Definitions: Stigma, discrimination
  10. Solidarity with the people affected and infected with HIV/AIDS
  11. Other mechanisms for the fight against stigma and discrimination and other deviant behavior.
- **Basic care at birth/neonatology: 1 credit (15 hours); L, T, P, SPW**
  1. The care of personal hygiene
  2. Period of reactivity - Apgar score
  3. The reactions to the Birth: adaptation of the respiratory system, cardiovascular system, system hepatic impairment, the gastrointestinal system, adaptation of the renal system, adaptation immunological.
  4. The care at birth: Tracks upper air, the umbilical bandage, care of the eyes, the weighing and surveying, toilet, dressing, the identification
  5. The first reviews: the general condition of the Child, the screening of malformations, the neurological examination
  6. Interventionsessentielles of care: the prevention of infections, the thermal protection, breastfeeding early, immunization, vitamin K1
  7. Parent-Child Relationship
  8. Preparation of the ouPHut: the Declaration of the birth

MID125:Primary health care – nursing care/Obstetric/ neonatal/of basis - Hygiene and Sanitation/First Aid

- **Primary Health Care: 1 credit (15 hours); L, T, P, SPW**
  1. Generality on the health, disease, the development: social and community level
  2. Definition of concepts: primary health care: what are they?
  3. Which offers primary health care? The characteristics of care
  4. Community Health
  5. Community Cooperation
  6. The primary health care (PHC) conference in Alma Ata
  7. Declaration of the Alma Ata Conference
  8. Description of the 08 components of primary health care
  9. Essential drugs and primary health care
  10. Concept of reference and against Reference

11. Description of the decisions of the Bamako Initiative (IB) and the Lusaka conference
12. Criterion of success of the IB

- **Nursing care / Obstetric /Neonatal of basis: 1 credit (15 hours); L, T, P, SPW**
  1. Definition of concepts: nursing, obstetrical care, neonatal care base, asepsis, disinfectant, Sterilization
  2. Practice the asepsis.
  3. Nursing in New-born
  4. Needs and nursing care of the new-born at risk: premature, small weight, children big for the term of the pregnancy, child of diabetic mother, child of surrogate mother of HIV, parent of a new-born in high risk
  5. Nursing care in case of complications in the newborn (asepsis, respiratory distress, neonatal jaundice, hemolytic disease, neonatal anemia, infection, viral haemorrhagic disease)
  6. Nursing care in cases of congenital anomalies and management risks of family trauma
  7. Nursing care in the mother - Monitoring of the mother
  8. Nursing care in isolation in box -Nursing record
- **Hygiene and Sanitation: 1 credit (15 hours); L, T, P, SPW**
  1. General information on the hygiene
  2. Areas of hygiene: personal hygiene, food hygiene, hospital hygiene, environmental hygiene
  3. General principles of hygiene
  4. Definition and objectives of the Remediation
  5. Sanitation System - Field of sanitation
  6. Obstacle related to hygiene and sanitation in the Middle hospital care
- **First aid: 1 credit (15 hours); L, T, P, SPW**
  1. The first care according to the type of disaster
  2. Transport of evacuees.
  3. Knowledge of first aid: history, objectives, use of emblems
  4. Volunteering: law and duties of the rescuer, first-aid attendant's role in the community
  5. First Aid to the victims: general principles, clinical examination summary, gesture and techniques of first aid
  6. Principle of first aid

MID126: Clinical Internship 1

- **Activities: 6 credits (90 hours); P**

1. Nursing care in the admission of the Nursing mother
2. Nursing care during labor
3. Organization of a spontaneous childbirth
4. Role of the Sage-Femme in delivery room/work

5. Role of the Sage-Femme during normal work : partogramme and GAPHA
6. Medical interventions
7. Care in post partum immediate of the mother and the Newborn
8. Home of the new-born - Apgar score -care of the Umbilical Cord
9. Eye care - physical examinations of the new-born by the Sage-Femme
10. Identification of the new-born- folder of nursing care.
11. Surveillance of the mother - Mother-Child Relationship

MID127: Approach of care - Kind - Human Rights

- **Approach of care: 1 credit (15 hours); L, T, P, SPW**

1. Concept of the person in its entirety
2. Definition of concepts: conceptual model, professional role of the midwives/maieutician, Diagnosis of care
3. Concept of problems: real, potential
4. Types and choice of conceptual models
5. Description of the steps of the process of care: stages of data collection
6. Data analysis and interpretation, planning, implementation of interventions and evaluation
7. Concept of formulation of the diagnostics of care

- **Kind: 1 credit (15 hours); L, T, P, SPW**

1. Concept and terminology: kind, socialization, stereotype, discrimination
2. The biological sex - The Social Sex or Gender -Organizations and Conferences framework for the promotion of the kind: the Beijing Conference
3. The Different Approaches Gender: Equality of man-woman, equity of man-woman, parity of man-woman - Evolution of the concept of gender
4. A few manifestation of discrimination based on the Gender: Equality economic, social, cultural, political- Kind and MDG 3
5. Gender Approach and Development - Care related to the approach Gender and Health
6. The "woman empowerment "- The violence based on gender.

- **Human rights: 1 credit (15 hours); L, T, P, SPW**

1. Define the concepts: right, duty, Public Law, Private Law
2. General concepts on the right
3. The sources of the law: direct and indirect sources
4. The international and regional legal instruments of human rights:
   - The Declaration of Human Rights (article 25);
   - The American Declaration of the Rights and Duties of Man (article 33) ;
   - European Social Charter (Article11);
   - Pace International relating to economic, social and cultural rights (Article 12);

- African Charter of Human Rights and the rights of peoples;
- United Nations conferences on the Rights of women;
- The Fundamental Rights of Man;
- Health as a human right;
- Challenges Strategies to promote health.

5. Law in reproductive health
   - State of places of rights in reproductive health;
   - Reproductive right/Maternity - HIV/AIDS and human right.
6. The frequent sprains to rights in relation dereproduction

MID231: Other varieties of childbirth

→ **Other varieties of birth: 2 credits (30 hours); L, T, P, SPW**

1. Childbirth in the cephalic presentations other than the summit: Occipitopostérieur, Bregma, front face
2. Childbirth in presentation of seat
3. Childbirth in transverse positions and oblique (Presentation of the Shoulder).

MID232: Dystocia - Obstetric Pathologies - Obstetric Complications

→ **Dystocia: 2 credits (30 hours); L, T, P, SPW**

1. Dynamic dystocia or Mother tongues: Abnormalities of the uterine contraction; Anomalies of the cervical dilation.
2. Dystocia mechanical:
   - Related to the Fetus: Anomalies of positions - Anomalies of presentations - anomalies related to the development of the fetus - anomalies related to fetal annexs;
   - Related to the mother or anomalies of the basin- Tumors pelvic (previa).
3. Complications of dystocia:
   - Maternal complications;
   - Fetal complications.
4. Conduct before each type of dystocia:
   - Conduct preventive;
   - Curative conduct.

→ **Obstetrical pathologies: 3 credits (45 hours); L, T, P, SPW**

1. Bleeding in early pregnancy: abortions/pregnancy stopped, ectopic pregnancies, diseases trophoblast gestationnelles (pregnancy môlaire, choriocarcinoma)
2. Bleeding at the end of pregnancy: placenta previa, haematoma placental retro; - Hyperemesisgravidarum

3. Fetal pathology: intra-uterine growth retardation, suffering fetal (acute and chronic), small birth weight, macrosomia, threat of premature birth, prolonged pregnancy-post-term, fetal death in utero, multiple pregnancy
4. Pathology of fetal annexs: pathology of the membranes and the amniotic fluid premature rupture of the membranes, polyhydramnios, oligohydramnios, Chorioamnionitis adhesions, amnion flanges
5. Pathology of the umbilical cord: Anomalies of length (brevity, excess length)
6. Anomalies of the position of the Cord: circulars, straps, nodes, procidentia, latérocidence, presentation of the Cord - Anomalies of insertion

→ **Obstetric complications: 2 credits (30 hours); L, T, P, SPW**

1. Fever in the beginning of the work - syndrome of pre-rupture
2. Bleeding during the work: placenta previa- Placentae Placenta
3. Uterine rupture - hypertensive diseases and pregnancy
4. The pre-eclampsia
5. Hypoglycaemia in the course of the work - suffering acute fetal
6. Procidentia of the Cord - The eclampsia

MID233: Methods of research - Statistics - Advanced Nursing

→ **Methods of the research: 1 credit (15 hours); L, T, P, SPW**

1. The epistemological foundations in research:

- Facts as elements of departure of the research;
- The objectives of the research;
- A few key concepts in research;
- Approaches to research;
- Methods in research;
- Scope of the research;
- Importance of the research;
- How to determine the research themes;
- Ethical issues in research;
- Practical advice for the drafting of a memory.

2. Framework of the project

- Theme;
- Introduction;
- General interest;
- Specific interest in the discipline;
- Problem;
- Problematic;
- Question of research;
- Objectives;

- Methodological approach;
- Conclusion;
- Bibliography.

3. Framework of the Protocol

- Theme;
- Background / justification of the study;
- Problem;
- Problematic;
- Question of research;
- Assumptions;
- Objectives;
- Conceptual framework;
- Theoretical Framework;
- Methodology (place, type of search, search method, population, technical collection, collection tool, ethical considerations);
- Budget/ funding;
- Calendar of activities.

4. Framework of the memory

- Theme;
- Executive Summary;
- Dedication;
- Acknowledgments;
- Abbreviations, acronyms and abbreviations;
- List of figures;
- List of tables;
- Executive Summary;
- Abstract;
- Introduction;
- Context of the study ;
- Problem;
- Problematic;
- Research questions;
- Assumptions;
- Objectives;
- Conceptual framework;
- Theoretical Framework;
- Methodology;
- Presentation of the results;
- Summary and discussion;
- Conclusion and suggestions;
- Bibliography - Table of Contents unto Annexs.

- **Statistics: 2 credits (30 hours); L, T, P, SPW**
    1. Definition of the concepts of base (population, statistical unit, character, variable, table statistics)
    2. Statistics varied uni
        - Graphic representations (diagram in stick, pipe organ, sector);
        - Digital description (mean, mode, median proportion, cumulative frequencies growing and decreasing, variance, standard deviation).
    3. Statistics varied bi
        - Graphic representations (diagrams juxtaposed, stacked);
        - ODigital description (average marginal, marginal frequency); o Association between variables (cloud of points, contingency table, correlation coefficient, covariance);
        - Analytical Adjustment (linear regression by least square without tests of significance, Mayer).
    4. Elements of statistics-mathematical (test of comparison of average, test of comparison of proportion, test of independence of KHI-two)
    5. Practice Elements of investigations (Elements of Sampling, development of questionnaires, data collection, data processing informatics and statistics of data)

- **Advanced nursing practice: 1 credit (15 hours); L, T, P, SPW**
    1. Bladder catheterization
    2. Aseptic Collection of urine, blood for blood culture
    3. Gastric conduit
    4. Stomach washing
    5. Establishment of an indwelling catheter in a peripheral vein, establishment of a catheter in a central vein, establishment of a umbilical arterial catheter, installing a nasogastric tube, methods of administration of liquids by the parenteral route, lumbar puncture
    6. Blood transfusion
    7. Nursing care pre, PER and post-operative
    8. Suturing wounds and ablation of the Son
    9. Dressing With drainage
    10. Care of the burned
    11. Maintenance of the incubators and the hardware
    12. Nursing in New-born/ premature in the brooder
    13. Nursing care post-partum at mother-child pair
    14. Nursing care to the patient in a state of disorder of conscience
    15. Nursing records

MID234: Epidemiology - Demography - Community Health

- **Epidemiology: 1 credit (15 hours); L, T, P, SPW**
    1. Definition and generalities of epidemiology
    2. Approaches in epidemiology
    3. Interest of the epidemiology
    4. The frequency measures of health PWnomena
    5. Extent of morbidity and mortality
    6. Epidemiological Tripod: the epidemiological chain
    7. Epidemiological investigations and measures of association
    8. Fight against an epidemic
    9. Notions of sensitivity, specificity, predictive values
    10. General prophylaxis of communicable diseases
    11. Epidemiological surveillance and the PWnomena of mass.

- **Demography: 1 credit (15 hours); L, T, P, SPW**
    1. Notions of demography
    2. Social and political significance of the demographic facts on the health
    3. Fundamental areas of the Demographic Analysis
    4. Demographic Dimensions
    5. Structures and demographic phenomena
    6. Sources of demographic information
    7. Demographic indicators
    8. A measure of the state of health of the population
    9. Causes of the deterioration of the health of populations
    10. Prevention in public health

- **Community health: 1 credit (15 hours); L, T, P, SPW**
    1. Definition of concepts: health, community, community health, public health, community diagnosis, community participation, health development, relationship between health and development
    2. Concepts on the promotion of health
    3. Notions of needs and problems of public health
    4. Concept of request/ supply of health care
    5. Analysis of individual needs and the community
    6. Study of the Determinants
    7. Establishment of the profile of the community.
    8. Methods and tools for data collection
    9. Identification of key informants at the local level
    10. Identification of priority problems in community health
    11. Formulation of objectives
    12. Identification of resources
    13. Choice of strategies and interventions

14. Analysis of the Strengths, Weaknesses, Opportunities and Threats
15. Formulation of the program of intervention and Budgeting
16. Monitoring and Evaluation

MID235: Pediatrics - Vaccination - Advanced techniques in Obstetrics

- **Pediatrics: 2 credits (30 hours); L, T, P, SPW**
    1. Infectious pathologies in Pediatrics
        - Viral infections: -HIV and interpretation of the diagnostic test of HIV among the child
        - Viral Meningitis -viral Encephalopathies -Enteroviruses …;
        - Bacterial infections: aseptic meningitis, meningococcemia, tuberculous meningitis, scarlet fever, tetanus;
        - Parasitic Infections: Trichomonas intestinal, malaria, pediculosis;
        - Infections of the ENT sphere: acute otitis media, chronic otitis media, sinusitis in the child, acute nasopharyngitis, amygdalites acute or chronic, acute angina epistaxis.
    2. Fever in the child
    3. Osteo infections joints
    4. Reflux esophageal gastro
    5. Hypertrophic stenosis of the pylorus
    6. Constipation
    7. Purpura of the Child
    8. Dysphonia
    9. Congestive heart failure of the Child
    10. Dehydration
    11. Diarrhea Acute or chronic,
    12. Malabsorption syndrome
    13. Invaginations acute intestinal
    14. Intestinal obstruction
    15. Epilepsy
    16. Autism
    17. Diabetes of the Child
    18. Convulsions of the Child
    19. Dizziness
    20. Disorders of the language.

- **Vaccination: 1 credit (15 hours); L, T, P, SPW**
    1. General information on the vaccination
    2. The objectives of the expanded program of immunization (EPI)
    3. Classification of vaccines
    4. Epi target diseases
    5. Estimate of needs for vaccines
    6. Management of stocks of vaccines

7. Follow-up to the use of vaccines
8. Schedule of vaccination of the ENP
9. Vaccine strategies
10. Planning and organization of a day of vaccination
11. Vaccination in the adult and the young child - Management of the chain of cold
12. Security and quality of vaccines - Safety of Injections
13. Monitoring aefis (MAPI)
14. Safe Disposal of Waste
15. Management of side effects of the Vaccines
16. Maintenance of the chain of cold
17. Communication in the area of immunization

- **Advanced Techniques in obstetrics: 2 credits (30 hours); L, T, P, SPW**
    1. Test of work (test of basin)/ TEST OF scar
    2. Induction/ stimulation of work
    3. Episiotomy
    4. Instrumental birth: Obstetric Suction Cup - Forceps
    5. Version:, cephalic, podalique external and internal, mixed and intervention of the Midwives
    6. Monitoring By monitoring Continuous fetal
    7. Cesarean section in labor (cesarean delivery of emergency)
    8. Planned cesarean section
    9. Obstetrical maneuvers:
        - Dystocia shoulders: maneuver of Mac Roberts, maneuver of WOODREVERSE, maneuver of JACQUEMIER, maneuver of Gaskin, maneuver of COUDER, maneuver of WOOD or RUBIN, maneuver of LETELLIER;
        - Delivery by headquarters: Method of VERMELIN, maneuver of BRACHT, maneuver of MAURICEAU, maneuver of LOVSET, maneuver of SUZOR, maneuver of KRISTELLAR, maneuver of MAURICEAU-SMELLIE-VEIT, maneuver of DEMELIN.

MID236 : Community Practicum

→ **Community internship: 6 credits (90 hours); P**

MID237: Medical English/French medical - ICT 2

- **Medical English/French medical 2: 1.5 credits (22.5 hours); L, T,P, SPW**

1. Semiology of the genital apparatus English/French
2. Physiology of the Pregnancy - Prenatal Consultation
3. Signs and symptoms of common pathologies in gynecology and obstetrics
4. Medical history and an assessment of needs: Dialog - Conversation
5. Drafting of reports (transmission, custody, activity)

6. Specific instruments used in gynecology and obstetrics

- **Technique of the information and of the communication 2: 1.5 credits (22.5 hours); L, T, P, SPW**

1. Creation of a simple database with a spreadsheet (How to Give a name to a cell range)
2. Validation of Data in a range of cells on a spreadsheet
3. Creation of the statistical tables simple (modality, workforce, frequency) and automatic filling with functions such as NB, NB.If and NB.If.ENS, Average, Sum, if
4. Creation of graphics from statistical tables
5. Presentation and use of a statistical software (ex: Epi Info)
6. Creation of a questionnaire on EPI info or other
7. Data entry and analysis
8. Definition of the concepts of the computer network
9. Presentation of the types of media and networks
10. Presentation of Internet (Connection, research, download)

MID241 : Gynecology - Obstetrical Care

- **Gynecology : 2 credits (30 hours); L, T, P, SPW**

1. The organs of the female genital tract: vulva, clitoris, large lips, small lips, vagina, uterus, fallopian tubes, ovaries, glands of Skene, a gland of Bartholin…
2. Physiology of the genital tract of the woman: Crisis neonatal genital, childhood not reached puberty, normal menstrual cycle, puberty, adult woman, menopause,
3. Consultation in Gynecology : Interrogatoireet general clinical examination
4. Gynecological examination itself
5. The complementary examinations: VIA/VILI (screening of cervical cancer) –Échography Coelioscopy- smear cervico-vaginal - Colposcopy - Hysterosalpingography - Scanner - Magnetic Resonance Imaging - Hysteroscopy - hormonal assays.

- **Obstetrical care: 2 credits (30 hours); L, T, P, SPW**

1. Nursing care in the admission of the Nursing mother
2. Physiology of the work
3. Induction of Labor
4. Phases of the labor and delivery
5. Assessment of the status of the mother and the Fetus
6. The different stages of the work
7. Nursing care during labor
8. The role of the Midwife during work: use of the partogramme
9. Complications of labor and delivery

10. Organization of a spontaneous birth: practice of the GAPHA
11. Practice of the PTME during childbirth and the postpartum period
12. Home of the new-born and immediate care: Apgar score, resuscitation; care of the cord and eyes, measurements, injection of vitamin K
13. Physical examination and neurological of the new-born in the search of the Anomalies
14. Mother-child relationship
15. Diagnosis and support for the hemorrhage of the immediate pospartum: taking of vital parameters, uterine revision, bimanual compression of the uterus, compression of the aorta, artificial issuance, repair of tears in the maternal genital tract, use of utérotoniques
16. Supported the shock
17. Strategy for the prevention of posPHartum hemorrhage
18. The role of the Midwife/Maieutician in operating block: physical preparation, psychological, home of the new-born, resuscitation
19. Suites of layers normal and pathological
20. Follow-up to the post-partum: CPON, vaccination, PF

MID242: Pediatrics/neonatology/pathologies new-born – gynecologicalPathologies

- **Pediatrics/neonatology/pathologies new-born: 3 credits (45 hours); L, T, P, SPW**
    1. Respiratory distress of the new-born o score of Silverman
    2. Clinical Review of the new-born
    3. Monitoring of the growth of the new-born
    4. Neonatal Resuscitation
    5. Follow-up of the new-born in the course of his stay in the Maternity
    6. New-born of small Weight: premature and hypotroph
    7. Supply of the mother and the Newborn
    8. Support for new-born of HIV-positive mother to HIV and viral hepatitis - neonatal jaundice
    9. Neonatal tetanus (reminder)
    10. Haematological diseases of the Newborn
    11. Neonatal infections
    12. Neonatal asphyxia - neonatal seizures
    13. Hemorrhage cranial intra
    14. Congenital Malformations: Congenital Heart Defects Cyanogen unto - cyanogenic non
    15. Malformations of the uro-genital
    16. Abnormalities of the nervous system: hydrocephalus - microcephaly,
        - Spina bifida… malformations of the musculoskeletal system: Omphalocelecephalhematome …

17. Malformation of the respiratory system
18. Malformation of the digestive system:
    - Stenosis of the Esophagus - congenital megacolon;
    - Anal imperforate… - obstetrical trauma: bump sero blood-- Fractures - nerve lesions: elongation of the brachial plexus…
19. Surgical emergencies orthopaedic and of the new-born
20. Communication with the mother (advice on hygiene, the supply of the new-born and the mother, the vaccination and follow-up visits in relation to certain local customs)
21. Organization of the transfer and home of the new-born

- **Gynecological pathologies: 2 credits (30 hours); L, T, P, SPW**

1. Gynecological semiology: pain, abnormal vaginal discharge, bleeding
2. Disorders of the sexuality: vaginismus, dyspareunia, frigidity, libido
3. Disorders of the menstrual cycle: dysmenorrhea, irregularity of the cycle, hypo or hyperménorrhée, oligo or Polymenorrhea, pollakiménorrhée, spanioménorrhée, menorrhagia, metrorrhagia, Metro-menorrhagia, amenorrhea (primary, secondary)
4. Genital infections Low: bartholinite, vulvite, vaginitis
5. Genital infections High (inflammatory diseases) Pelvic
6. Congenital malformation of the genital apparatus
7. Genital prolapse
8. Dysplasia of the Cervix
9. Voluntary interruption of pregnancy (VIP)/ medical interruption of pregnancy
10. Endometriosis - Fibroid tumors of the uterus -ovarian cysts
11. Pubertal disorders: early puberty, late puberty
12. The trauma of the genital tract: obstetric fistula
13. Infertility of pair.

MID243: Analgesic in obstetrics - Communication

- **Analgesic in obstetrics: 2 credits (30 hours); L, T, P, SPW**

1. Definition and physiology of the pain of labor
2. Factors that influence the perception of pain
3. Mechanisms, routes of transmission and factors modulating the pain of the work: Evolution of pain during the course of the stages of the work - Integration of the nociceptive message
4. Impact maternal and fetal pain during the course of the work:
    - Effects on the mother;
    - Effects on the uterine activity and the conduct of the work
    - Effects on the fetus.
5. Methods of obstetric analgesia: Epidural analgesia, association rachianalgésieanalgésie epidural, block cervical para

- Pharmacological bases and systemic therapeutic: the pharmacokinetics, pharmacodynamics of analgesia, analgesics most used, their mode of action, monitoring of the epidural analgesia during the work;
- Therapeutic bases non pharmacological: psychological methods, psychoprophylactiques, physical methods, stimulation of circuits of inhibition, and the methods «obstetrical".

➢ **Communication: 2 credits (30 hours); L, T, P, SPW**

1. Reminder on the generalities of the communication
2. Verbal communication and non-verbal communication
3. Different media in communication
4. Principles of effective communication
5. Main techniques of interpersonal influence
6. Intervention in a crisis situation, ethical dilemmas
7. Axioms of the communication - typology of the communication
8. Forms of interpersonal communication
9. Definition and general information on the technique of the listening
10. Framework of the REDI (report building, exploration, decisionmaking and implementing the decision) - A Few tracks facilitating the animation of a group.

MID244 : PTME - AIDS/IST

➢ **PTME: 2 credits (30 hours); L, T, P, SPW**

1. Introduction on HIV and AIDS
2. Comprehensive approach to the reduction of HIV infection in the mother, the infant and the child
3. Specific interventions for the prevention of the transmission of HIV from mother to child: (antenatal care: option B+, counselling, pre-test and post-test and put the mother under treatment, hygiene of life and food)
4. Specific actions for the prevention of HIV during labor and childbirth
5. Specific actions for the prevention of HIV in the posPHartum period - care post-natal of infants exposed to HIV
6. Infant feeding in the context of HIV infection
7. Reference and cross-reference in the PTME
8. Prevention and Treatment of opportunistic infections
9. Psychosocial support community and
10. Stigma and discrimination in relation with the PTME
11. Security and supportive care in the workplace
12. Role of Service Providers

➢ **Aids/IST: 2 credits (30 hours); L, T, P, SPW**

1. Introduction on HIV and AIDS

2. Comprehensive approach to the reduction of HIV infection in the mother, the infant and the child
3. Specific interventions for the prevention of the transmission of HIV from mother to child: (antenatal care: option B+, counselling, pre-test and post-test and put the mother under treatment, hygiene of life and food)
4. Specific actions for the prevention of HIV during labor and childbirth
5. Specific actions for the prevention of HIV in the pospartum period
6. Post-natal care of infants exposed to HIV
7. Infant feeding in the context of HIV infection
8. Reference and cross-reference in the PTME
9. Prevention and Treatment of opportunistic infections
10. Psychosocial support community and
11. Stigma and discrimination in relation with the PTME
12. Security and supportive care in the workplace
13. Role of Service Providers

MID245: Obstetric pathologies

- **Obstetric pathologies: 4 appropriations (60 hours); L, T, P, SPW**

1. The complications of childbirth:
   - Tears vulvopérinéales;
   - Tears of the vagina;
   - Tears of the COL;
   - Uterine ruptures;
   - Accidents traumatic urinary during childbirth;
   - Amniotic fluid embolism.
2. Complications of the issuance:
   - Placental retention;
   - Hemorrhages of the issuance;
   - Placenta acreta/increta/percreta;
   - Uterine inversion.
3. Complications of suites of layers:
   - Puerperal infections: endometritis, thrombophlebitis

   - Puerperal psychosis;
   - Breast complications and anomalies of the breast-feeding.

MID246:Clinical Internship 2

→ **Activities: 6 credits (90 hours); P**

1. Physiological changes of pregnancy: genital tract, respiratory system, cardio-vascular system, gastrointestinal system, urinary system, skin, skeletal system, metabolism, endocrine system.
2. Emotional changes and psychological: ambivalence, body image, emotional instability.

3. Symptoms and signs of pregnancy
4. The pregnancy tests: biological and immunological
5. Prenatal consultations refocused(CPNR) - Purpose of the CPNR - Calendar of CPNR - Assessment of risk factors - Review of the pregnant woman - complications of pregnancy - detection and early treatment of diseases - Assessment of fetal condition - Plan of preparation for childbirth - Measures of prevention - Teaching of signs of danger - Prenatal Balance Sheet
6. Items in the folder of the CPNR, education of the health of the Pregnant Woman: needs and care of the pregnant woman (breast care, travel, rest and physical exercises, alcohol, tobacco, drugs, medicines, nutrition, immunization, hygiene of life, usual ailments, sexuality, family planning, sanitation).

MID247: Family Planning, Initiation to research

→ **Family planning: 2 credits (30 hours); L, T, P, SPW**

1. Brief reminder on the anatomy and physiology of the female genital organs and the male
2. General information on contraceptive methods
3. Components of family planning
4. Eligibility Criteria
5. Counselling According to the method lulled/REDI
6. Balance sheet for the prescription of methods
7. The prevention of infections
8. Contraceptive Technologies: mode of action, advantages and disadvantages - hormonal methods:
   - Barrier methods (mechanical and chemical);
   - Natural methods and surgical methods;
   - Iuds
   - Contraception in specific situations.

→ Initiation to research: 1 credit (15hours); L, T, P, SPW

1. In Health Research
2. Sources of Knowledge
3. Methods of Reasoning
4. Stages of the research process (rational, assumptions, literature review, methodology, results/discussion, summary, bibliography)
5. Classification of research
6. Establishment of the Questionnaires
7. Ethics
8. Preparation and Presentation of Research Reports
9. Case practice: drafting of protocols of research

Construction of a Research proposal: **Background:** Literature review, formulating the problem statements, justification of studies, objectives, framing the questions according to general and specific objectives; is developing a testable hypothesis to achieve the objectives for quantitative research selection, referencing, etc.; Ethical considerations; Work plan: personnel; timetable project administration; Plans for dissemination.

Data collection and management: Design and Pretesting of measuring instruments (reliability and validity of instruments);training of interviewers; quality control of measurements; computerization, checking and validating, measurements; the issue of missing observations, statistical summarization of information; testing of hypothesis.

Analysis & presentation of Results; Report writing and format.

MID351: Anthropology - Reproductive health and sexual law - Toxicology

- **Anthropology: 1 credit (15 hours); L, T, P, SPW**
  1. Concept of anthropology and ethnology
  2. The customs and cultural PWnomena
  3. The innate unto the acquis unto myths and beliefs
  4. Cultural attitudes to health, disease, death
- **Reproductive health and sexual right: 2 credits (30 hours); L, T, P, SPW**
  1. Definition
  2. Sexual and Reproductive Health
  3. Convention on the Rights of the Child
  4. The strategies laid down for the Reproductive Health:
     - Medical objectives;
     - The breeding system;
     - Pregnancy and childbearing;
     - Family planning;
     - Hiv/aids;
     - Abortion;
     - Female circumcision and genital mutilation.
- **Toxicology: 1 credit (15 hours); L, T, P, SPW**
  1. Definition
  2. Classification of Drugs
  3. Tobacco, Alcohol: effect on the reproduction on the health and pregnancy

MID352 : Anesthesia - Resuscitation - Infertility/Infertility

- **Anesthesiology: 2 credits (30 hours); L, T, P, SPW**
  1. Introduction to the anesthesia
  2. Definition
  3. History of the anesthesia
  4. The Pain

5. Characteristic of Anesthetic drugs
6. Status of the patient before anesthesia
7. The 10 golden rules of anesthesia
   - Preparation of the patient to the anesthesia and choice of the anesthetic protocol
   - Preparation of the anesthetic equipment;
   - Position of the patient on the operating table and its physiological implications;
   - Stages of the anesthesia: premedication unto Induction unto maintenance;
   - Monitoring of the anesthetic alarm clock;
   - A few techniques: local anesthesia regional and- general anesthesia.

- **Resuscitation: 2 credits (30 hours); L, T, P, SPW**
  1. Cardio-pulmonary resuscitation in adults and the child (Neonatal)
  2. The detection of signs of sudden cardiac arrest
  3. Aid to the vital functions
  4. Basic gestures of survival
- **Infertility/Infertility: 1 credit (15 hours); L, T, P, SPW**

1. **Infertility**

- Generality - Definition
- Examination for the Torque - in humans - among the woman - Clinical examinations in man - in women - Complementary examinations:
  - Exploration of the ovulatory cycle;
  - Hystérographie;
  - Sperm analysis - Spermocytogramm;
  - Hormonal exploration;
  - Test post coïtal.
- Etiology of the infertility of couples in humans;
- Among women.

2. **Infertility**

- Definition;
- Causes;
- Treatments.

MID353: Association pregnancy and PEG pathology

- **Association pregnancy and PEG pathology: 2 credits (30 hours); L, T, P, PW**

1. Pregnancy and Parasitic Diseases

- Helminthiasis infections;
- Malaria; - Toxoplasmosis; - Etc.

2. Pregnancy and infectious diseases

- Syphilis unto TBC;

- Rubella;
- Aids - other infections.

3. Pregnancy and Heart Disease

- Congestive heart failure;
- Anemia.

4. Pregnancy and diabetes

MID354 : Gynecology and Gynecological pathologies

→ **Gynecology and gynecological pathologies: 1 credit (15 hours); L, T, P, SPW**

- Gynecological examinations
- Sexuality
- Abnormal vaginal discharge
- Salpingites
- Genital ulcers
- Aids/ist
- Contraception
- IVG
- Infertility in the Couple
- Agp
- Genital bleeding

In women

- Pelvic Ch
- Primary aménorrhées
- Secondary aménorrhées
- Menopause
- Prolapse/EU
- Pelvic swelling
- Fibroma
- Ovarian cyst
- Screening for cancers
- Benign pathologies of the neck of the uterus
- Cervical Cancer
- Cancer of the endometrium
- Cancer of the Ovary
- Benign pathology of the breast
- PEG of the victims of sexual abuse

MID355 : Emergencies Obstetric and Neonatal

→ **Emergency Obstetric and Neonatal: 1 credit (15 hours); L, T, P, SPW**

1. Supported the shock
2. Support for complications of pregnancy and childbirth
3. Support for the new-born
4. Care of the post partum

MID356: Implementation maternity situation - Community Internship

- **Implementation maternity situation: 6 credits (90 hours);P**

- The Evaluation Internship at the service maternity.

- **Community internship: 6 credits (90 hours); P**

  - Adopt a systematic vision of the work in community health, and in particular a multidisciplinary vision and centered on the population;
  - Acquire the necessary know-how to the realization and the evaluation of health interventions community;
  - The course of learning in the community will be carried out in combination with the realization of the memory.

MID357: Civics and ethics - Official Language

- **Civic education and ethics: 2 credits (30 hours); L, T, P, SPW**

  - Presentation of concepts:

- The citizen - the nation - the State,
- Public property unto collective property,
- The freedoms;
- The public service;
- Problem of ethics,
- Ethics, Law and reason;
- Management and ethics of responsibility;
- Ethics and management;
- Civics
- Deontology
- Moral consciousness
- The universal declaration of Human Rights
- Good governance in public services
- The importance of civics to the life of the nation
- Functions of the state and its citizens
- Deontology, Professional ethics and professionalism
- Relationship between morality, law and ethics
- Codes of ethics

- **Bilingual Training: 1 credit (15 hours); L, T, P, SPW**

- How to write a test results;
- How to describe the various collection of sample.
- The pathologies by systems
  - Urinary system;
  - Cardiovascular System;
  - Digestive system;
  - Endocrine system;
- The dispensing of drugs

MID361: Gerontology/geriatrics + IEC 3 - Administrative Writing Psychiatry/Psychopathology

- **Gerontology/psychiatry: 3 credits (45 hours); L, T, P, SPW**
    1. Psycho-social dimension of the geriatric patient
    2. Geriatrics
        - The types of aging;
        - Aging of devices;
        - The immune system;
        - Nutritional problems of older persons;
        - National Health Strategy in the field of policy of the elderly.

- **Administrative writing: 1 credit (15 hours); L, T, P, SPW**
    1. The letter
    2. The waybill
    3. The Account-rendering - the report
    4. The Administrative Note - The Telegram
    5. The periodic parts unto the Member Ŕsituation unto Questionnaire 6. The various administrative printed

- **Psychiatry/psychopathology: 2 credits (30 hours); L, T, P, SPW**
    1. Worries and recklessness
    2. Models of abnormal behavior
    3. Influence of the growth and development
    4. Sociocultural practices and interpretation of mental health
    5. Care of Persons of extinct mental pathologies
    6. National Classification international and mental disorders
    7. Specific behaviors
    8. Behavioral Management
    9. Role of the Nurse
    10. Legal coverage and preventive aspects of mental health

MID362: Medical Imaging - Quality Assurance - Entrepreneurship

- **Medical Imaging: 1 credit (15 hours); L, T, P, SPW**
    1. Basic notions on the Radiation
    2. Current Reviews and preparation of patients for a diagnostic radiology
    3. Transit ulcer, barium enema, urography unto cholecystography, arteriography, scannographie
    4. For a diagnosis by ultrasound
    5. For a diagnosis by nuclear magnetic resonance (MR)
    6. For a diagnosis by radioactive iodine
    7. Radiation protection for personnel and patients

- **Quality assurance: 1 credit (15 hours); L, T, P, SPW**
    1. Standardized definition - What is the quality
    2. The Quality Assurance - Why a quality system

3. Followed by a quality system? See a Total Quality
4. The certifications and standards, the purpose of a quality system
5. The cost of the quality approach unto Conclusion

➢ **Entrepreneurship: 1 credit (15 hours); L, T, P, SPW**

1. Definitions and theoretical aspects of entrepreneurship
2. Start a Business
3. The keys to success in entrepreneurship
4. Business Plan (Business Plan)
5. Formalities of creation of a company in Cameroon.

MID363: The Economics of Health - Drafting of memory

➢ **The economics of health: 2 credits (30 hours); L, T, P, SPW**

- **Basic concepts in health economics:** supply, demand, the financing of the Health;
- **Concept of the market in health:** the supply of health care; request of care; financing of care.
- **The funding in health:** social protection, pooling of the financing of the Health;
- **Health Financing in Cameroon** : Community funding (CNPS, mutual health and system put in place by the state for public servants); non-Community funding (budget of the ministries concerned, public health and other…); bilateral and multilateral cooperation (NGOS, other donors, …)
- **The health planning;**
- **Health system and their assessment:** effectiveness, efficiency, cost, effectiveness/efficiency, cost / efficiency.

➢ **Drafting of Memory: 1 credit (15 hours); L, T, P, SPW**

It depends on the theme of work of the learner; it must be drafted in accordance with the following plan:

- Executive Summary;
- Introduction: 2 pages maximum. The introduction, it is spring loaded to the problematic:
  - The question of research,
  - It sets the assumptions;
  - It sets the general objective;
  - It sets out the specific objectives and sets out the plan;
- Chapter I, II: a review of the literature (literature review);
- Chapter II, III: The methodology;
- Chapter III, IV: Presentation of the results and discussion;
- Conclusion and Recommendations;
- Bibliography.

MID364 : IMCI

→ **IMCI : 3 credits (45 hours); L, T, P, SPW**

1. Evaluate and classify the sick child aged 2 months to 5 Years
   - Evaluate and classify the sick child
   - When a child is brought to the Health Center
   - The general signs of danger
   - The cough and breathing difficulties
   - Diarrhea - Fever - the affection of the Ear
   - Malnutrition and anemia - immunization status - Other Problem
2. Evaluate and classify the infant patient age from 1 week to 2 months
   - View the whole of the assessment and the classification
   - Assess and classify the sick infant
3. Determine the Treatment
   - Order of priority of the Treatments
   - Determine the pre-treatment urgent transfer
   - Determine the treatment of patients who do not need to be taken to hospital for emergency care
   - Treat the child or infant sick
   - Overview of the different types of treatments
   - The emergency hospitalization
   - Appropriate medicines to be administered by the oral route
   - Treatment of infections Local
   - Treatment of diarrhea -vaccinations
4. Communicate and advisor
   - To know how to communicate
   - Teach to administer a drug by oral route at home
   - Teach to treat local infections at home
   - Advise the mother in case of problems of breastfeeding
   - Advise the mother about the supply of her child
   - Indicate to the mother when it is necessary to bring the child back to the health center and how it must protect its own health
5. Ensure follow-up care
   - The care of follow-up given to the sick child
   - Follow-up care given to the infant ill.

MID365: Follow-up to the work and obstetrical maneuver

➢ **Follow-up to the work and obstetrical maneuver: 2 credits (30 hours); L, T, P, SPW**

1. Dystocia shoulders
2. Maneuver of MAC ROBERT
3. Maneuver of WOOD REVERSE
4. Maneuver of JACQUEMIER
5. Maneuver of GASKIN
6. Maneuver of COUDER

7. Maneuver of LETELLIER
8. The historical maneuvers: Ribemont Dessaignes - Zaratte- Zavanelle
9. Presentation of the seat
    - Method of VERMELIN;
    - Maneuver of BRACHT: Indication - technique;
    - Maneuver of MAURICEAU: Indication - technique;
    - Maneuver of LOVSET: Indication - technique;
    - Other maneuvers: maneuver of Suzor - KRISTELLAR (MAURICEAU-SMELLIE-VEIT) - DEMELIN.

MID366: Internship (MSP maternity) - Internship (MSP pediatrics)

- **MSP Maternity: 5 credits (75 hours); P, SPW**
- **MSP Pediatrics: 5 credits (75 hours); P, SPW**

MID367: Professional Ethics and Deontology - ICT

- **Medical English/medical French: 2 credits (30 hours); L, T, P, SPW**

Professional Ethics &Deontology

Objective: At the end of the course, the student should be able to know those values and obligations which practice in the profession.

Content: Nurse, Patient, nurse/patient relationship, obligations of the nurse, rights of the patient, rights and responsibilities of the nurse, deontology, ethics, etiquettes, patient reception in hospital, nurse/patient-relative relationship. Medical jurisprudence, lab practice and the law, forensic nursing, malpractice, civic duties, organization of Government, Common law, labour law, Criminal Law,etc.

Health care Ethics

- Morality and Ethics: Norms, Deviances, Religion, Values, Beliefs, Cultures
- Bioethics
- MLS Ethics
- Moral Development
- Ethical Principles: Autonomy, Freedom, Privacy, Confidentiality, Beneficence, Fidelity, Motivation, Justice, Veracity and Responsibility.
- Code of Ethics health workers.
- Application of Ethics to MLS Practice: Respect For Life And Death, The Concept Of Dignity, Euthanasia, Human Rights, Rights of The Child, Rights of The Elderly, Patients Rights
- Ethical Decision Making Frameworks and their Application in diagnosis
- Context And Conflicts With Bioethical Standards

Patient Rights:

- Respect for life and death, the concept of dignity, euthanasia

- Care for dying patients: Palliative care, Confidentiality, Professional secrecy, Medical Research and Nursing care ethics.
- Code of ethics.
- Health Employee/employer contract law for health practitioners
- MLS and the law

Introduction to Law and Fundamental Rights

Law

- Sources of law
- Law and enabling Acts (text of application)
- The concept of legal personality
- Civil responsibility (contract, TORT)
- Criminal responsibility
- The court and their jurisdictions
- Labor law: formation and execution of labor contract, remuneration, condition of work, obligation of the employer and employee, termination of labor contracts

Fundamental Rights

- The concepts of human rights
- Sources of human right
- Major international conventions of human rights
- International conventions relating to women
- Children and the rights of the minorities
- The role of the judiciary and the legislative in the protection of human rights
- The Cameroon national commission of human rights and liberties
- The civil society NGO's and the protection of human rights

Law for Medical laboratory personnel

- Definition of Law, public law, private law
- The client's and MLS personnel's' constitutional right
- Administrative law related to licensing and regulation of health practice

- **Information and Communication Technologies: 2 credits (30 hours); L, T, P, SPW**
    1. Initiation to a database management software
    2. Numbering System
    3. Initiation to PowerPoint
    4. The Internet

Field: MEDICAL AND BIOMEDICAL SCIENCES

Specialty:

OPTICIAN / CLINICAL OPTOMETRY

Field:	MEDICAL AND BIOMEDICAL SCIENCES
Specialty:	**Optician / Clinical Optometry**

1. Objective of the training

The HND specialty Optician aims to train professionals to combat the low vision and avoidable blindness. These professionals are responsible for correcting visual defects with glasses and administering emergency eye care.

2. ResearchSkills

→ **Generic skills**

- Be responsible and reflective;
- Have gestural skills and interpersonal skills;
- Recognize your emotions and use them with the necessary professional skills;
- Have proven trust and confidence;
- Have critical ability and questioning;
- Develop an ethical and a professional normal;
- make thoughtful decisions;
- Act with autonomy and responsibility in the well-defined fields of its function;
- Master the management (financial, stock, human resources), marketing and standards opposite the regulations in force for the best monitoring of activities in law firms;
- Being able to communicate easily both in writing and orally;
- Master the computer tool and ICT.

→ **Specific skills**

The control of refraction (visual examination)

- Adapt the prescription and establish the formula of the optical equipment;
- Propose and evaluate solutions (in terms of compensation protection Ŕ performance ...);
- Perform visual examination and low vision tests;
- Find an anomaly and refer to another health professional;
- Communicate, ensure and develop relations with health professionals.

Sales Technician - Marketing

- Welcome, inquire about needs and provide information;
- Prepare the sale;
- Analyze the morphology, the posture, the face of the client;

- Analyze the visual needs of the client (prescription use customer's wishes);
- carry out the preliminary tests, put in condition of use and take the measurements (spectacles, specific equipments);
- Design the equipment (glasses, specific equipment);
- Propose and choose the equipment (glasses, specific equipment);
- Write the execution sheet;
- Perform the preliminary tests, put in condition of use and take the measures (low vision, contact lenses);
- Propose, advise and sell optical instruments (visual aids, microscopes, binoculars,telescopes, terrestrial and astronomical spectacles);
- Propose, advise and sell accessories and optics maintenance products.

Equipment mounting technique

- Knowledge of workshop equipment;
- Composition and characteristics of the grinding wheels;
- Characteristics of the different types of grinding wheels (hand grinding wheels, creasing machines, grinding machines, automatic grinding wheels);
- The different programs for cutting glasses;
- Food ;
- Water circuit ;
- Waste disposal ;
- Precautions for use;
- Routine maintenance and consumables.

Centering and focusing glasses

- Centering mode (manual-pointing engraving Ŕ automatic;
- References according to glasses;
- References according to the measurements;
- Transcription of measures;
- Fixing the glass;
- Choice of the adapted support.

Drilling - notching

- Different types of drills;
- Position of the holes notching;
- Fixing systems.

Assembly of glasses

- Preliminary checks;
- Axing, horizontality of the glasses;
- Condition of the frame (meniscage);
- Choice of material adapted (to the type of frame and the type of glasses).

Rebuilding

- Following a protocol adapted to the frame and glasses;
- According to the recommendations requested (pre-adjustment);
- Prepare the equipment for delivery.

Repair, Maintenance

- Metal frames;
- Plastic frames;
- Ice frames (Nylon, breakthrough).

3. Opportunities

- Public function;
- Hospitals and private clinics;
- NGOs (Non Governmental Organizations);
- Self-employment;
- Occupational Medicine ;
- Research and training

4. Organization of the Teachings

Semester 1

Field : Medical and Biomedical Sciences		**Specialty: OPTICIAN / CLINICAL OPTOMETRY**					
Code	**Courses titles**	**Hourly Volume**					**Number Of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
OPT111	Anatomy and Physiology of the Eye I	54	18	13	5	90	6
OPT112	Mathematics-physical-chemistry	30	10	0	5	45	3
Professional Courses 60% (4 UC) 18 credits 270 hours							
OPT113	General knowledge on the profession, Care Primary Ocular	45	15	10	5	75	5
OPT114	Geometrical optics and Physics I	30	10	0	5	45	3
OPT115	Optometry the theoretical and the practical	30	13	13	4	60	4
OPT116	Internship of impregnation in a cabinet of optics	***2 weeks***				90	6
Transversals Courses 10% (1 UC) 3 credits 45 hours							
OPT117	Bilingual Training	28	8	5	5	45	3
Total		**218**	**72**	**135**	**25**	**450**	**30**

Semester 2

Field : Medical and Biomedical Sciences		Specialty: OPTICIAN / CLINICAL OPTOMETRY					
Code	Courses titles	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
OPT121	Physics II and Chemistry II	40	10	6	4	60	4
OPT122	Anatomy and Physiology of the Eye II	45	15	9	6	75	5
Professional Courses 60% (4 UC) 18 credits 270 hours							
OPT123	General Optical and geometric II	30	9	3	3	45	3
OPT124	Study of the optical systems	40	10	6	4	60	4
OPT125	Knowledge of teachingmaterials	48	15	7	5	75	5
OPT126	Internshipadvancedacademic	***2 weeks***				90	6
Transversals Courses 10% (1 UC) 3 credits 45 hours							
OPT127	First Aid and Eye care of emergency	30	9	3	35	45	3
Total		**233**	**68**	**124**	**25**	**450**	**30**

Semester 3

Field : Medical and Biomedical Sciences		Specialty:OPTICIAN /CLINICALOPTOMETRY					
Code	courses titles	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 Courses) 9 credits 135 hours							
OPT231	Eye Care Primary	36	12	8	4	60	4
OPT232	Consultation and Review of objective view	45	15	9	6	75	5
Professional Courses 60% (4 Courses) 18 credits 270 hours							
OPT233	Review of subjective view I	45	15	9	6	75	5
OPT234	Hygiene and Public Health	18	6	4	2	30	2
OPT235	Review of subjective view II	35	20	15	5	75	5
OPT236	Practice of consultation of mass (school-village)	***2 weeks***				90	6
Transversals Courses 10% (1 Courses) 3 credits 45 hours							
OPT237	Education on ethics, citizenship, and ICTS	30	9	3	3	45	3
Total		**219**	**72**	**132**	**27**	**450**	**30**

Semester 4

Field : Medical and Biomedical Sciences		Specialty:OPTICIAN / CLINICAL OPTOMETRY					
Code	**Courses titles**	**Hourly Volume**					**Number of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
OPT241	Eye Care developed, Review of subjective view III	50	19	12	9	90	6
OPT242	Mathematics-physical-chemistry	30	7	2	6	45	3
Professional Courses 60% (4 UC) 18 credits 270 hours							
OPT243	-Optical contact, objective Refraction	45	15	9	6	75	5
OPT244	Low Vision	18	6	4	2	30	2
OPT245	Reviewadvanced subjective	27	15	30	3	75	5
OPT246	Professional practice	***2 weeks***				90	6
Transversals Courses 10% (1UC) 3 credits 45 hours							
OPT247	Introduction to Research and Biostatistics	30	9	3	3	45	3
Total		**200**	**71**	**150**	**29**	**450**	**30**

Semester 5

Field : Medical and Biomedical Sciences		SPECIALTY:OPTICIAN /CLINICAL OPTOMETRY					
Code	**Courses titles**	**Hourly Volume**					**Number of credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental Courses30% (2 Courses) 9 credits 135 hours							
OPT351	Economy and Management of company I	50	12	10	3	75	5
OPT352	Economics and BuNUSess Management II	45	8	4	3	60	4
Professional Courses 60% (4 Courses) 18 credits 270 hours							
OPT353	Research and presentation of the Protocol		28		2	30	2
OPT354	Follow-up of the research and field work I	***2 weeks***				75	5
OPT355	Follow-up of the research and field work II	***2 weeks***				75	5
OPT356	AcademicInternship	***2 weeks***				90	6
TransversalsCourses 10% (1 Course) 3 credits 45 hours							
OPT357	Teaching of Languages and acquisition of competence in ICT	26	3	10	6	45	3
Total		**121**	**51**	**264**	**14**	**450**	**30**

Semester 6

Field : Medical and Biomedical Sciences		**Specialty: OPTICIAN/ Clinical OPTOMETRY**					
Code	**Courses titles**	**Hourly Volume**					**Number of credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental Courses 30% (2 Courses) 9 credits 135 hours							
OPT361	Research and presentation of the Protocol		28		2	30	2
OPT362	Research	***To define***				105	
Professional Courses 60% (4 Courses) 18 credits 270 hours							
OPT363	Professional internship I	***2 weeks***				75	5
OPT364	Professional internship II	***2 weeks***				75	5
OPT365	Professional internship III	***2 weeks***				75	5
OPT366	Project Defense	***To define***				45	3
TransversalsCourses 10% (1 Course) 3 credits 45 hours							
OPT367	Professional Ethics and Deontology	30	9	3	3	45	3
Total		**30**	**37**	**378**	**5**	**450**	**30**

5. Courses content

OPT111: Anatomy and Physiology of the Eye I

- **Anatomy and Physiology of the eye: 6 credits (90 hours); L, T, P, SPW**
    1. General Biology
    2. Microbiology
    3. Anatomy
    4. Physiology I
    5. Physiology II
    6. Anatomy
    7. Mathematics
    8. Physical
    9. Chemistry

OPT112: Mathematics - Physics I - Chemistry

- **Mathematics: 1 credit (15 hours); L, T, P, SPW**
- **Physics I: 1 credit (15 hours); L, T, P, SPW**
- **Chemistry: 1 credit (15 hours); L, T, P, SPW**

OPT113: General knowledge on the profession-Eye Care Primary

- **General knowledge of the profession: 2 credits (30 hours); L, T, P, SPW**
    - History of the profession
- **Eye care: primary 3 credits (45 hours); L, T, P, SPW**
    - Pathology of the eye

OPT114: Geometrical Optics and Physics II

- **Geometricaloptics: 2 credits (30 hours); L, T, P, SPW**
    - General Optical
- **Physics II: 1 credit (15 hours); L, T, P, SPW**
    - GeometricI

OPT115: Optometry the theoretical and the practical

- **Optometry theoretical and practice: 4 appropriations (60 hours); L, T, P, SPW**
    - Optometry I (general and theoretical)
    - Optometry II: practice

OPT116: Internship of impregnation in a cabinet of optics

- **Internship of impregnation in a cabinet of optical: 6 credits (90 hours); L, T, P,SPW**
    - Immersion internship I (impregnation)

OPT117: Bilingual training I and ICT I

- **French expression: 2 credits (30 hours); L, T, P, SPW**

1. **Form of words in French**
   - Prefix, radical;
   - Root, suffix.
2. **Explanation of words and group of words**
3. **Morphosyntax and rhetoric**
   - Components and structure of the sentence:
     - Simple sentence;
     - Complex sentence;
     - Sentence composed.
   - Figures of style:
     - Figures of analogy;
     - Figures of amplification;
     - Figures of opposition;
     - Figures of mitigation.
4. **Administrative correspondence and professional**
   - The different parts of a administrative correspondence and the administrative style
   - Professional Correspondence:
   - Note of service;
   - Record (activity, mission);
   - The report (activity, mission).
5. **Professional correspondence to individual dominance**
   - Application for employment;
   - CV;
   - Letter of motivation.
6. **Methodological Considerations on the written exercises**
   - French composition;
   - Contraction of text:
     - French composition: Reminder methodological and implementation;
     - Contraction of text: methodological reminder and application.
7. **Study of the communication situations.**
   - Identification of the factors in the situation of communication (transmitter, receiver, code, channel, message, context);
   - Situation of communication and verbal interactions;

• Study of the elements para verbal cues (kinesthetic, proxémiques, MIMO-gestural, etc.;
• Identification and handling of figures of expression and thought metaphors, irony. Satire, parody, etc.).

- **Techniques of Information and Communication 1: 1 credit (15 hours); L, T, P, SPW**

1. Concepts and architecture of computers
2. Definitions: computing, information, computer, data, program, software, drivers
3. System of enumeration of base 2, the unit of measure of the information and its multiple
4. Components of the computer (hardware and software)
5. Study of an operating system
6. Study of a text treatment software: Microsoft Word
7. Study of a spreadsheet/Microsoft Excel
8. Study of a presentation software: Microsoft PowerPoint

OPT121: Physical III and Chemistry II

- **Physics III: 2 credits (30 hours); L, T, P, SPW**

- **Chemistry II: 2 credits (30 hours); L, T, P, SPW**

OPT122: Anatomy and physiology of the Eye II

- **Anatomy and Physiology of the Eye II: 5 credit (75 hours); L, T, P, SPW**
  - Anatomy and Physiology II (eye)

OPT123:General Optical and geometric II

- **General Optical and geometric: 3 credits (45 hours); L, T, P, SPW**

OPT124: Study of optical systems

- **Study of optical systems: 4 appropriations (60 hours); L, T, P, SPW**
  - Physiological Optical

OPT125: Knowledge of teaching materials

- **Knowledge of teaching materials: 5 credits (75 hours); L, T, P, SPW**
  1. Instrumentation and Measurement I
  2. Study, realization, maintenance of equipment

OPT126 : Internship advanced academic

- **Academic Internship advanced: 6 credits (90 hours) ; L, T, P, SPW**

OPT127 First Aid and Eye care of emergency

- **First Aid and Eye care of emergency: 3 credits (45 hours); L, T, P, SPW**
  First Aid and care

OPT231: Eye Care Primary

- **Eye care: primary 4 appropriations (60 hours); L, T, P, SPW**
  1. General pharmacology
  2. Ocularpharmacology

OPT232: Consultation and Review of objective view

- **Consultation and Review of view Objective: 3 credits (45 hours); L, T, P, PW**
  - Pathology of the eye and correction II

OPT233:Examination of view subjectif I

- **Review of subjective view I: 5 credits (75 hours); L, T, P, SPW**
  - Methodology of optometry I

OPT234: Hygiene and Public Health

- **Hygiene and public health: 2 credits (30 hours); L, T, P, SPW**
  - Initiation to public health

OPT235: Examination of subjective view II

- **Review of subjective view II: 5 credits (75 hours); L, T, P, SPW**
  - Methods of optometry II

OPT236: Practice of consultation of mass (school-village)

- **Practice of consultation of mass (school-village): 6 credits (90 hours); L, T, P, SPW**
  - Internship of Community Health I

OPT237: Civic Education and ethics- ICT II

- **Civic Education and Ethics: 1 credit (15 hours); L, SPW**
  The Concepts
  - The citizen - the nation - the State,
  - Public property unto collective property,
  - The freedoms;
  - The public service;
  - Problem of ethics,

- Ethics, Law and reason;
- Management and ethics of responsibility;
- Ethics and management;
- Civics
- Deontology
- Moral consciousness
- The universal declaration of Human Rights
- Good governance in public services
- The importance of civics to the life of the nation
- Functions of the state and its citizens
- Deontology, Professional ethics and professionalism
- Relationship between morality, law and ethics
- Codes of ethics

- **Technique of the information and of the communication 2: 2 credits (30 hours);L, T, P, SPW**

1. Creation of a simple database with a spreadsheet (How to Give a name to a cell range)
2. Validation of Data in a range of cells on a spreadsheet
3. Creation of the statistical tables simple (modality, workforce, frequency) and automatic filling with functions such as NB, NB.If and NB.If.ENS, Average, Sum, if
4. Creation of graphics from statistical tables
5. Presentation and use of a statistical software (ex: Epi Info)
6. Creation of a questionnaire on EPI info or other
7. Data entry and analysis

OPT241:Eye care developed, Review of subjective view III

- **Eye Care advanced: 4 appropriations (60 hours); L, T, P, SPW**
  - Pathology of the eye
  - General hygiene and clinic
  - Quality assurance
- **Review of subjective view III: 2 credits (30 hours); L, T, P, SPW**

OPT242 :Mathematics II - Physical IV – Chemistry II

- **Mathematics II: 1 credit (15 hours); L, T, P, SPW**
- **Physical IV: 1 credit (15 hours); L, T, P, SPW**
- **Chemistry II: 1 credit (15 hours); L, T, P, SPW**

OPT24:Optical Contact, Objective Refraction

- **Optical contact, refraction Objective: 5 credits (75 hours); L, T, P, SPW**
  - Method of optometry III (contactology)

OPT244: Low Vision

Objectives

1- **Review of a View**
- Carry out a review of view to a subject of 08years and more
- Achieve a ophthalmoscopy of basis
- Achieve a refraction and prescribe corrective lenses
- Achieve a skiascopie
- Refer the patient

2- **Eye Care Primary**
- Acquire the specific knowledge of certain diseases of the eye and Annex (pathology)
- Acquire the concepts of Eye Care Primary (SOP)
- Be able to run programs for the screening of refractive errors
- To be able to refer a patient

3- **Workshop mounting**
- Check the characteristics of the lenses to fit
- Master the use of instruments and ophthalmic optics
- Carry out the assembly of the optical equipment or low vision
- Check the equipment Optical Vision or low vision

- **Initiation to research: 2 credits (30 hours); L, T, P, SPW**
  - Initiation to the research methodology

OPT245:Examination advanced subjective

- **Subjective review advanced: 5 credits (75 hours); L, T, P, SPW**
  - Method of optometry IV

OPT246 :Professional Practice

- **Professional practice: 6 credits (90 hours); L, T, P, SPW**

OPT247: Introduction to Research and Biostatistics

- **Introduction to Research**

Objective: At the completion of this course, students should be able to:

- Understand the concepts of research in the biomedical sciences and be able to apply them

- Be able to accurately describe the fundamental concepts and approaches in qualitative and quantitative research methodology.
- Be able to find and appraise the available research literature through the use of valid resources, and thereby provide informed opinion.
- Be able to raise research questions in professional practice and apply appropriate research methodology to investigate and solve the research questions.
- Write a research proposal for approval by the Ethics Committee.
- Understand the role of bias and confounding and how to control for these in selection of study design.
- Appreciate the role of chance/random error, and the appropriate choice and application of statistical testing to assess this.
- Demonstrate the skills and knowledge required for independent or group research.

Content:

Introduction to research: Meaning and objectives of research; definition and Significance of health research, importance of research methodology for health science students.

Scientific research: Definition; C**haracteristic of scientific research:** Purposiveness, Rigor, testability, reliability, validity, replicability, precision, generalizability, objectivity); **Dimensions of scientific research** (concepts, theories, deductive & inductive reasoning, empiricism, variables, hypothesis, propositions **Elements of the Scientific Method**: Empirical Approach, Observation, Question, Hypotheses, Experiments, Analysis, Conclusion, and Replication

Scientific research process:

Categories of Research: Empirical and theoretical research, Basic and applied, Descriptive vs Analytical Research, Quantitative vs Qualitative Research, Conceptual vs Empirical Research, Etc.

- **Biostatistics I**

Objective: To summarize, analyze, present and interpret health statistical information.

Content:

1. Introduction
2. Basic concepts in biostatistics
3. Sampling techniques and data collection
4. Variables (Qualitative and Quantitative)
5. Presentation of data: Frequency and frequency distribution, bar charts, Histograms, pie charts etc.
6. Summarization of qualitative and quantitative data: mean, median, standard deviations and standard errors.

- **Biostatistics II**

Content

1. The concept and Principles of Significant tests and confidence intervals
2. Statistical testing and inference: The normal distribution and t-distribution, Chi squared test, Poison distribution, non-parametric tests etc.
3. Errors in statistics

OPT351:Economy and Management of company I

- **Economy and Management of company I: 5 credits (75 hours); L, T, P, SPW**
    - Economics and management of the Cabinet of optician I
        - **Sale**
            - Welcomecustomers
            - Read and interpret an order
            - Propose an equipment adapted to the morphology and the needs of the customer
            - Perform a measurement socket (PDM)
            - Establish a quote respecting the regulation
            - Sell, Deliver and provide the advice of use and maintenance of the equipment delivered or purchased.
        - **The management**
            - Create a cabinet of optics and a unit of refraction
            - Ensure effective financial management
            - Ensure the management of stocks
            - Ensure the Management of Human Resources
            - Write a report of activity
        - **Maintenance of equipment**
            - Diagnose and ensure the maintenance of base and the distribution of technical equipment: the refer to specialists.

OPT352:Economics and Business Management II

- **Economics and Business Management II: 4 credit (60 hours); L, T, P, SPW**
    - Economics and management of the Cabinet of optician II
        - **Communication**
            - To be able to communicate with its partners (customers, suppliers, banks, administration) in French and in English.
            - Control of the ethics, ethics and the law relating to the profession
            - Mastery of the NICT

- Research and writing of the activity reports, coaching internships and the follow-up of drafting of memories (Initiation to research, drafting of protocols)

OPT353: Research and presentation of the PROTOCOL I

- **Research and presentation of the Protocol: 2 credits (30 hours); L, T, P, SPW**
  - Drafting of the research protocol and presentation

OPT354: Follow-up to the research and field work I

- **Follow-up of the research and field work I: 5 credits (75 hours); L, T, P, SPW**
  - Collection of data

OPT355:Follow-up of the research and field work II

- **Follow-up of the research and field work II: 5 credits (75 hours); L, T, P, SPW**
  - Collection of data

OPT356:Academic Internship

- **Academic Internship: 6 credits (90 hours); L, T, P, SPW**
  - InternshipCommunityHealth II

OPT357:Teaching of languages and acquisition of competence in ICT

- **ICT III: 1 credits (15 hours); L, T, P, SPW**

1. Definition of the concepts of the computer network
2. Presentation of the types of media and networks
3. Presentation of Internet (Connection, research, download)

- **French -English related to the profession: 2 credits (30 hours); L, T, P, SPW**

Objective: To develop communication skills in French and English language and thus enhance patient relationship as needed.

Content:

1. Grammar
2. Different parts of the human body
3. Conversation in French and English as specific to health care
4. Translation of Medical Terms, prescriptions, technical and protocol forms, drug dispensation notices
5. Drafting of reports
6. Documentation research
7. Use of data sheets and protocols in the French language.
8. Health structures, premises, equipment, professional categories

9. Drafting of researchtopics

-Dissertation on the professional articles

Interviews - Speech unto etc. ….

-Health structures, premises, equipment, professional categories

-Hospitals

-The Hardware

-The staff

-The Role

-The pathologies

-The drugs

- **The pathologies by systems**
  - Urinary system;
  - Cardiovascular System;
  - Digestive system;
  - The endocrine system.
- **The dispensing of drugs**

OPT361:Research and presentation of Protocol II

- **Research and presentation of the Protocol II: 2 credits (30 hours); L, T, P, SPW**
  - Drafting of the Research Protocol II and presentation

OPT362:Research

- **Research : 7 credit (105 hours) ; L, T, P, SPW**
  - Drafting the Memorandum

OPT363: Professional Internship I

- **Professional internship I: 5 credits (75 hours); L, T, P, SPW**
  - Implementation professional situation I

OPT364:Professional Internship II

- **Professional Internship II: 5 credits (75 hours); L, T, P, SPW**
  - Implementation professional situation II

OPT365:Professional Internship III

- **Professional Internship III: 5 credits (75 hours); L, T, P, SPW**
  - Implementation professional situation III

OPT366: Project Defense

- **Thesis Defense : 3 credits (45 hours); L, T, P, SPW**
  - Thesis defense of the brief

OPT367: Legislation, Professional Conduct and Deontology

- **Legislation, professional ethics and ethics: 3 credits (45 hours); L, T, P, SPW**
  - Right linked to the profession
  - Professional code of conduct and ethic

Objective: At the end of the course, the student should be able to know those values and obligations which practice in the profession.

Content: Nurse, Patient, nurse/patient relationship, obligations of the nurse, rights of the patient, rights and responsibilities of the nurse, deontology, ethics, etiquettes, patient reception in hospital, nurse/patient-relative relationship. Medical jurisprudence, lab practice and the law, forensic nursing, malpractice, civic duties, organization of Government, Common law, labour law, Criminal Law,etc.

Health care Ethics

1. Morality and Ethics: Norms, Deviances, Religion, Values, Beliefs, Cultures
2. Bioethics
3. MLS Ethics
4. Moral Development
5. Ethical Principles: Autonomy, Freedom, Privacy, Confidentiality, Beneficence, Fidelity, Motivation, Justice, Veracity and Responsibility.
6. Code of Ethics health workers.
7. Application of Ethics to MLS Practice: Respect For Life And Death, The Concept Of Dignity, Euthanasia, Human Rights, Rights of The Child, Rights of The Elderly, Patients Rights
8. Ethical Decision Making Frameworks and their Application in diagnosis
9. Context And Conflicts With Bioethical Standards

Patient Rights:

1. Respect for life and death, the concept of dignity, euthanasia
2. Care for dying patients: Palliative care, Confidentiality, Professional secrecy, Medical Research and Nursing care ethics.
3. Code of ethics.

- **Health** Employee/employer contract law for health practitioners
- MLS and the law

Introduction to Law and Fundamental Rights

Law

- Sources of law
- Law and enabling Acts (text of application)
- The concept of legal personality
- Civil responsibility (contract, TORT)
- Criminal responsibility
- The court and their jurisdictions

- Labor law: formation and execution of labor contract, remuneration, condition of work, obligation of the employer and employee, termination of labor contracts

Fundamental Rights

- The concepts of human rights
- Sources of human right
- Major international conventions of human rights
- International conventions relating to women
- Children and the rights of the minorities
- The role of the judiciary and the legislative in the protection of human rights
- The Cameroon national commission of human rights and liberties
- The civil society NGO's and the protection of human rights

Law for Medical laboratory personnel

- Definition of Law, public law, private law
- The client's and MLS personnel's' constitutional right

Administrative law related to licensing and regulation of health practice

Rappel

Description of Units of Teaching

Stains grouping the various units of teaching

1- Review of View (optometry)
2- Eye Care Primary (anatomy and physiology of the eye, physics, mathematics, chemistry, general biology, pharmacology, optical contact)
3- Fitting Workshop (Study, realization of equipment)
4- Sale (Communication and Marketing : supplies of equipment)
5- Management (economics and buNUSess management)
6- Maintenance of equipment (instrumentation and measurement)
7- Communication (teaching of languages and ICT)
8- Research and drafting of reports of internships, protocols and memory (introduction or initiation to research)

Field : MEDICAL AND BIOMEDICAL SCIENCES

Specialty :

PHYSIOTHERAPY

Field: MEDICAL AND BIOMEDICAL SCIENCES

Specialty: Physiotherapy

1. The objective of the training

The objective of the training is to give the student knowledge to ensure the rehabilitation of people suffering from physical paralysis, respiratory problems or rheumatism and trauma.

2. Research Skills

→ **Generic skills**

- Be responsible, reflexive and relational ;
- Have adequate gestures and capacities;
- Develop adequate interpersonal and intrapersonal skills to be able to interact effectively with their patients, entourage and the health team
- Should be trustworthy and reliable;
- Have the capacity for critical thinking, analysis and questioning;
- Develop ethical values of a normal professional;
- Make thoughtful and informed decisions;
- Be able to act with autonomy and responsibility in his area ofcompetence.
- Master the computer tool and ICT

→ **Specific skills**

- Perform manual or instrumental actions of rehabilitation, which aim to prevent the alteration of functional abilities, to contribute to their maintenance and, when they are altered, to restore or to supplement;
- Adapt to the evolution of science and technology;
- Know the laws of mechanics applicable to the human being;
- Master health policy and evolution as well as the issues of the sectoral health strategy in Cameroon and health legislation;
- Perform physiotherapy techniques,taking into account the psychological, social, economic and cultural characteristics of each patient's personality;
- Communicate to other health team any information likely to be useful for the establishment of the medical diagnosis or the adaptation of the treatment according to the state of health of the person and its evolution;
- Be able to perform sport related physiotherapy techniques.

3. Opportunities

- Public function;
- Hospitals and private clinics;
- NGO (Non Governmental Organizations);
- Self-employment;
- Sport and physical education;
- Occupational Medicine.

4. Organization of the Teachings

Semester 1

Field : Medical and Biomedical Sciences		**Specialty: PHYSIOTHERAPY**					
CODE	**Courses Titles**	**Hourly Volume**					**Number Of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
PHY111	Cell Biology - Histology - Anatomy Physiology I	75	20	/	10	105	7
PHY112	Neurophysiology - Physiology - General Chemistry	20	5	/	5	30	2
Professional Courses 60% (4 UC) 18 credits 270 hours							
PHY113	Psychology - Sociology - general anthropology - History of the Physiotherapy	30	24	/	6	60	4
PHY114	General methodology of the physiotherapy and rehabilitation I	35	25	/	15	75	5
PHY115	Infectious and parasitic diseases (including zoonoses)	55	15	/	5	75	5
PHY116	Motor activities and adaptation including the Psychomotricity - Ethics and Professional Deontology	40	15	/	5	60	4
Transversals Courses 10% (1 UC) 3 credits 45 hours							
PHY117	Bilingual training - NICT I	25	5	10	5	45	3
Total		**285**	**75**	**12**	**78**	**450**	**30**

Semester 2

Field : Medical and Biomedical Sciences		Specialty: PHYSIOTHERAPY					
Code	Courses Titles	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
PHY121	Biomechanics - anatomy physiology II	60	20	5	5	90	6
PHY122	General pharmacology and clinical pharmacology	30	10	/	5	45	3
Professional Courses 60% (4 UC) 18 credits 270 hours							
PHY123	Law related to the profession	20	5	/	5	30	2
PHY124	Epidemiology - Bio statistics - Health and Development	70	20	/	5	105	7
PHY125	Nursing care and first aid	20	5	16	4	45	3
PHY126	Clinical Internship I	/	/	60	/	60	4
TransversalsCourses 10% (1 UC) 3 credits 45 hours							
PHY127	Civic Education and Ethics	30	10	/	5	45	3
Total		**235**	**56**	**94**	**65**	**450**	**30**

Semester 3

Field : Medical and Biomedical Sciences		Specialty: PHYSIOTHERAPY					
Code	Courses Titles	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
PHY231	Anatomy physiology III - Chemistry physiology	60	20	/	10	90	6
PHY232	Mineral chemistry - Organic Chemistry	30	10	/	5	45	3
Professional Courses 60% (4 UC) 18 credits 270 hours							
PHY233	Psychology applied to physiotherapy	20	8	/	2	30	2
PHY234	Physiotherapy and Rehabilitation Methodology II - Elements of didactics and methodology of motor activities	60	20	/	9	90	6
PHY235	Special pathologies and specific physiotherapy I - IEC 2	40	15	/	5	60	4
PHY236	Clinical Internship II	/	/	60	30	90	6
TransversalsCourses 10% (1 UC) 3 credits 45 hours							
PHY237	Medical English/medical French 2- ICT II	30	10	/	5	45	3
Total		**230**	**65**	**93**	**62**	**450**	**30**

Semester 4

Field : Medical and Biomedical Sciences		Specialty: PHYSIOTHERAPY					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
PHY241	General Economy - Hospital management - Initiation to research	70	15	/	5	90	6
PHY242	Priority Healthprograms	36	4	/	5	45	3
Professional Courses 60% (4 UC) 18 credits 270 hours							
PHY243	Special methodology of physiotherapy I	30	10	0	5	45	3
PHY244	Special pathologies and specific Physiotherapy II	40	/	25	10	75	5
PHY245	Special pharmacology of Physio II	40	10	/	10	60	4
PHY246	Community internship I	/	0	70	20	90	6
TransversalsCourses 10% (1 UC) 3 credits 45 hours							
PHY247	Medical Law	30	10	/	5	45	3
Total		**227**	**70**	**100**	**53**	**450**	**30**

Semester 5

Field : Medical and Biomedical Sciences		Specialty: PHYSIOTHERAPY					
CODE	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
PHY351	Neurophysiology - Human and Special Metabolic I - Health Economics	55	5	20	10	90	6
PHY352	Human Neurophysiology, the physiology of movements	25	5	10	5	45	3
Professional Courses 60% (4 UC) 18 credits 270 hours							
PHY353	Special methodology of physiotherapy	20	0	20	5	45	3
PHY354	Special gynecological Pathology	30	0	10	5	45	3
PHY355	Community Internship 2	/	/	70	20	90	6
PHY356	Clinical Internship 3	/	/	70	20	90	6
TransversalsCourses 10% (1 UC) 3 credits 45 hours							
PHY357	Information and Communication Technology 3	30	10	/	5	45	3
Total		**190**	**37**	**180**	**43**	**450**	**30**

Semester 6

Field : Medical and Biomedical Sciences		Specialty: PHYSIOTHERAPY					
CODE	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
PHY361	Professional project	55	10	/	10	75	5
PHY362	IEC 3 - Health Promotion	30	10	/	20	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
PHY363	Apparatus and prosthesis in physiotherapy	30	/	25	5	60	4
PHY364	Professional situation related to special pathologies I	/	/	55	5	60	4
PHY365	Professional situation related to special pathologies II	/	/	55	5	60	4
PHY366	Clinical Internship 4	/	/	70	20	90	6
TransversalsCourses 10% (1 UC) 3 credits 45 hours							
PHY367	Initiation to research, Medical functional French / English	30	10	/	5	45	3
Total		**196**	**49**	**153**	**52**	**450**	**30**

5. Courses content

PHY 111: Cell Biology - Histology - Anatomy Physiology I

- **Cell Biology - Histology: 1 credit (15 hours); L, T, SPW**

1. **Cell Biology and Histology**
   - The cell:
     - Structure;
     - Multiplication;
     - Physiology;
   - The tissue:
     - Epithelial tissue;
     - Connective tissue;
     - Nervous tissue;
   - Concept of genetics.

- **Anatomy - Physiology I: 4 appropriations (60 hours); L, T, SPW**

1. Nervous System

- Histology of the central and peripheral nervous system;
- Physiology of the central and peripheral nervous system: nervous influx, transmission of the influx (chemical mediators, synapse, driving plate), arc reflex;
- Organization of the central nervous system and functional localization: spinal cord, and medulla oblongata, brain, meninges and CSF;
- System Device nervous, cranial nerves, plexus;
- Neuro-vegetative system: sympathetic and parasympathetic.

2. The Endocrine System

- Endocrine pancreas;
- Thyroid: anatomy - Histology - physiology;
- Parathyroids: anatomy physiology, metabolism of calcium;
- Adrenals: Histology Anatomy, Physiology.
- System hypothalamo-pituitary;
- The stimulines.

3. Organ of meaning

- The eye : the view;
- The ear: hearing and balance;
- Smell: Taste;
- Touch.

4. System Musculoskeletal

- Ceos;

- The osteites;
- The osteomyelitis.

5. Digestive System

- General topography;
- The peritoneum;
- Main categories of foods :
  - ✓ Energy needs;
  - ✓ Animal heat.

6. Urinary system

- Structure and Physiology of the following organs: the kidney, the ureters, the urethra and bladder;
- Excretory Role of the skin.

PHY 112: Neurophysiology - Physiology - General Chemistry

- **Neurophysiology - Physiology: 1 credit (15 hours); L, T, SPW**
  1. Cell homeostasis
  2. Concept of electrophysiology
  3. The action potential and mechanism of the nerve conduction velocity
  4. Study of contractile tissue, neuromuscular transmission
  5. Mechanism of the facilitation and the inhibition in synaptic the central nervous system
- **General Chemistry: 1 credit (15 hours); L, T, SPW**
  1. Mixture and pure body
  2. The major processes of immediate analysis
  3. Simple body unto the compound body
  4. Constitution of the subject, atoms, molecules and ions

PHY 113: Psychology - Sociology - General anthropology - History ofthe Physiotherapy

- **Introduction to Psychology: 1 credit (15 hours); L, T, SPW**
  1. Study behavior, custom, food habits, environment of the communities
  2. Organization of the company: men in society (definition of the man, the individual, society), analysis of the life of a people
  3. Professional Conduct of an agent of Health (physiotherapy): professional ethics, professional conscience
  4. Approach of the lines in relation to the attitudes of the communities
  5. Application of the psychology of health groups
- **Sociology - Anthropology: 2 credits (30 hours); L, T, SPW**
  1. Introduction to Sociology

2. Concept of anthropology and ethnology
3. Evolution of life and of man in its dimensions biological, psychological and social assistance
4. Culture and cultural PWnomena
5. The innate, the acquis, myths and beliefs
6. Cultural attitudes to health, disease, death
7. Medical practices of yesterday, today alternatives and traditional medicine
8. Notions of group; social groups (family, work group, institution)
9. Dynamics of small groups
10. Dynamics of conflict (leaders)
11. Communication and communication networks

- **History of the Physiotherapy: 1 credit (15 hours); L, T, SPW**
    1. Physiotherapy in the 17th century
    2. The physiotherapy and its evolution up to our days
    3. The design of the physiotherapy in Asia, in Europe, in America
    4. The physiotherapy, its evolution in Cameroon

PHY 114: General methodology of the Physiotherapy and Rehabilitation I

- **General methodology of the physiotherapy and rehabilitation: 5 credits (75 hours); L, T, SPW**

    1. Humanist approach of the patient
    2. Palpation and tactile perception
    3. Elements of the clinical examination of the patient
    4. Massage
    5. Specific methodology of research in physiotherapy: Introduction to Climate The 2D, 3D related to the human body. Different methods of relaxation

PHY 115: Infectious and Parasitic Diseases (including zoonoses)

- **Infectious and parasitic diseases: 5 credits (75 hours); L, T, SPW**

1. **Parasitic diseases**

    - The helminthiases infections;
    - Onchocerciasis;
    - Malaria;
    - Trypanosomiasis;
    - The amoebic dysentery;
    - The Gale;
    - The bilarziosis.

2. **Infectious Diseases**

- The gonorrhea;
- Cholera;
- The cerebral meningitis-spinal;
- Measles;
- The tetanus;
- The trachoma;
- Tuberculosis;
- The yellow fever;
- Diphtheria;
- The concepts of food poisoning;
- Bacillary dysentery;
- The leprosy;
- Polio;
- The jaundice;
- Pneumonia;
- The kwashiorkor;
- Anemia;
- The rheumatism;
- Bronchitis and cough;
- The varicella;
- The malnutrition;
- Stomatitis;
- The otitis;
- The conjunctivitis;
- Cystitis;
- The communicable diseases (and compulsory declaration).

PHY 116: Motor activities and adaptation including the psychomotricity - Ethics and Professional Deontology

- **Motor activities and adaptation including the psychomotricity: 2 credits (30 hours); L, T, SPW**
    1. Fundamental gymnastics and soft gymnastics
    2. Psychomotricity
    3. Implementation Physical Condition
    4. Swimming
    5. Initiation to the basketball
    6. Handling
- **Ethics and Professional Deontology: 2 credits (30 hours); L, T, SPW**
    1. Theoretical Bases of the ethics and the Ethics

2. Philosophical Foundations of medical ethics and care
3. Values, beliefs, cultures, religions, standards, deviances
4. Respect for life and death, the concept of dignity, euthanasia, confidentiality
5. The professional secrect
6. Ethics in the daily practice of care (case study from professional experience)
7. Right to the man
8. The right of the Child (child abuse)
9. The right of elderly persons, the Sick
10. Accompaniments of dying (palliative care)
11. The ethics of medical research and care, case study
12. Code of deo of personal medico-sanitary

PHY 117: Bilingual training – ICTS I

- **English and French expression: 2 credits (30 hours); L, T, P, SPW**

1. **Form of words in French**
   - Prefix, radical;
   - Root, suffix.
4. **Explanation of words and group of words**
5. **Morphosyntax and rhetoric**
   - Components and structure of the sentence:
     - Simple sentence;
     - Complex sentence;
     - Sentence composed.
   - Figures of style:
     - Figures of analogy;
     - Figures of amplification;
     - Figures of opposition;
     - Figures of mitigation.

4. **Administrative correspondence and professional**
   - The different parts of a administrative correspondence and the administrative style
   - Professional Correspondence:
   - Note of service;
   - Record (activity, mission);
   - The report (activity, mission).

5. **Professional correspondence to individual dominance**
   - Application for employment;
   - CV;
   - Letter of motivation.

6. **Methodological Considerations on the written exercises**

- French composition;
- Contraction of text:

- French composition: Reminder methodological and implementation;
- Contraction of text: methodological reminder and application.

7. **Study of the communication situations.**

• Identification of the factors in the situation of communication (transmitter, receiver, code, channel, message, context);
• Situation of communication and verbal interactions;
• Study of the elements para verbal cues (kinesthetic, proxémiques, MIMO-gestural, etc.;
• Identification and handling of figures of expression and thought metaphors, irony. Satire, parody, etc.).

➢ **Technique of the information and of the communication 1: 1 credit (15 hours); L,T, SPW**

1. Concepts and architecture of computers
2. Definitions: computing, information, computer, data, program, software, drivers
3. System of enumeration of base 2, the unit of measure of the information and its multiple
4. Components of the computer (hardware and software)
5. Study of an operating system
6. Study of a text treatment software: Microsoft Word
7. Study of a spreadsheet/Microsoft Excel
8. Study of a presentation software: Microsoft PowerPoint

PHY 121: Biomechanics - Anatomy Physiology II

➢ **Biomechanical : 2 credit (30 hours); L, T, P, SPW**

- General information;
  - Kinematic: ostéocinétique, arthrocinétique;
  - Kinetic;
    - Dynamic;
    - Static, etc.
    - The levers.

- **Anatomy Physiology II: 4 credit (60 hours); L, T, P, SPW**

1. **Anatomy and Physiology of the cardio-vascular system**
   - The heart: anatomy (configuration external and internal structure, histology of the heart muscle). Physiology (automatism, revolution, heart sounds, electrocardiogram).
2. **The vessels**
   - Anatomy of the arteries and veins: their structure;
   - Anatomy of the large and the small circulation;
   - Circulatory physiology: blood pressure, venous circulation and capillary.
3. **The blood**
   - Plasma and dissolved substance;
   - Figurative Elements;
   - Hematopoiesis, hemolysis, blood group;
   - The coagulation;
   - The transfusion;
   - The reticuloendothelial system: Spleen, lymphatic, thymus.
4. **Respiratory System**
   - Anatomy: upper airway (nasal cavity, pharynx, larynx, trachea);
   - Bronchi, lungs, pleura: anatomy and histology;
   - Physiology of the respiratory health: mechanism for regulating nervous and chemical PWnomena.
5. **Digestive System**
   - General topography of the peritoneum;
   - The main categories of food;
   - Energy needs, animal heat;
   - Mouth, salivary gland, pharynx, esophagus (Anatomy and Physiology)
   - Anatomy physiology of the stomach, duodenum, small intestine, colon and rectum; - Liver: anatomy, liver and nutrition, liver and blood, antiseptic function; - bile, exocrine pancreas.

PHY 122: General Pharmacology and Clinical Pharmacology

- **General Pharmacology: 1 credit (15 hours); L, T, SPW**

1. General information
2. Definition
3. Classification of Drugs According to: their pharmaceutical form, their origin, pharmacodynamics
4. Routes of administration of drugs
5. Fate of the drug in the body

6. Mode and variation of action of drugs

- **Clinical Pharmacology: 2 credits (30 hours); L, T, SPW**
  1. Modifyer of growth and metabolism: Hormones, Vitamins, the regulators or modifiers of the blood glucose and diuretics
  2. The drugs of infectious diseases: antibiotics, sulphonamides, antiseptics and antituberculosis drugs
  3. Pest control the
  4. The antifungal agents
  5. Analgesics
  6. The anti-inflammatory drugs
  7. Corticosteroids

PHY 123: Law related to the profession

- **Law related to the profession: 2 credits (30 hours); L, T, SPW**

  1. Company
  2. Ethics and Law and Social Life
  3. The concepts of health and education
  4. Place the body in the moral and in law
  5. The right and duties of the individual and of the Community (right of patients, the rights of the person and the health care system)
  6. Privatization and publicisation of Health
  7. Respect for private life and social cost of the health
  8. Autonomy
  9. Participation, etc.

PHY 124: Epidemiology - Bio statistics - Health and Development

- **Epidemiology: 2 credits (30 hours); L, T, SPW**
  1. Importance of the epidemiology, preventive care
  2. Indices of community health in relation with the epidemiology
  3. Analytical methods of demography
  4. Program of investigation in Health
  5. Epidemiological study of acute diseases and chronic conditions
  6. Methodology and Statistics in the field of research
  7. Analysis of the data
  8. Introduction on the insects (brachycères, nématogeres, marangonins, arachnids malacologie)
- **Bio statistics: 2 credits (30 hours); L, T, SPW**

  1. Descriptive statistics

  - Descriptive statistics to one or two variables: measure of central trends and dispersal;
  - Graphical representation, scatter diagram;

- Correlation coefficient;
- Regression line;
- Contingency table;
- Probability: elementary notion, functions of density theoretical and empirical, diagram quantile-quantile plots.
- Example of data in the sciences of life.

2. Inferential Statistics

- Inferential Statistics: simple random sampling;
- Central Limit Theorem;
- Estimate of the average and the proportion for the large samples;
- Experimental protocol simple;
- Tests of hypotheses on an average and on a proportion;
- Tests of hypotheses on a difference of two averages or of two proportions for large samples.
- Use of a statistical software.

➢ **Policy and Health System (PSS): 2 credits (30 hours); L, T, SPW**

1. Concept of public health, history and the Revolution, reorientation of primary health care (central level, intermediate, device, community participation, co-management, cost recovery, essential drugs and minimum package of activity), the principles of care in public health
2. Organization of health services
3. The Servicing of health districts
4. Management of a health training
5. Overview on the priority programs (ENP, malaria, AIDS, tuberculosis).

➢ **Information, Education and Communication (IEC): 1 credit (15 hours); L, T, SPW**

1. The concepts of the IEC
2. The methods of assessment of the nutritional status of populations
3. Food ration of the different groups of individuals

PHY 125: Nursing Care and First Aid

➢ **Nursing: 1 credit (15 hours); L, T, SPW**

- Elements of Approach of care: Models of Virginia Henderson;
- Care in medicine and care in surgery:
  - Comfort care,
  - Administration of Drugs;
  - Taken settings;
  - The antiseptics;
  - The materials and instruments of surgery ;

- The sterilization;
- Dressings and sutures.

➢ **First aid: 2 credits (30 hours); L, T, SPW**

- The principles of first aid;
- Injuries;
- First Aid in case of:
  - Fracture,
  - Hemorrhage,
  - Sprains,
  - Burns;
  - Asphyxiation,
  - Poisoning;
  - Bite of beast, etc.
- Cardiorespiratory massage.

PHY 126: Clinical Internship I

➢ **Clinical internship 1: 6 credits (90 hours); P, SPW**

PHY 127: Civic Education and ethics and Initiation to Research

➢ **Civic Education and Ethics: 3 credits (45 hours); L, T, SPW**

- The citizen - the nation - the State,
- Public property unto collective property,
- The freedoms;
- The public service;
- Problem of ethics,
- Ethics, Law and reason;
- Management and ethics of responsibility;
- Ethics and management;
- Civics
- Deontology
- Moral consciousness
- The universal declaration of Human Rights
- Good governance in public services
- The importance of civics to the life of the nation
- Functions of the state and its citizens
- Deontology, Professional ethics and professionalism
- Relationship between morality, law and ethics
- Codes of ethics

- **Research Project**

- **Initiation to research: 1 credit (15hours); L, T, P, SPW**
  1. Research in Physiotherapy
  2. Sources of Knowledge
  3. Methods of Reasoning
  4. Stages of the research process (rational, assumptions, literature review, methodology, results/discussion, summary, bibliography)
  5. Classification of research
  6. Establishment of the Questionnaires
  7. Ethics
  8. Preparation and Presentation of Research Reports

Case practice: Drafting of protocols of research

Construction of a Research proposal: **Background:** Literature review, formulating the problem statements, justification of studies, objectives, framing the questions according to general and specific objectives; is developing a testable hypothesis to achieve the objectives for quantitative research selection, referencing, etc.; Ethical considerations; Work plan: personnel; timetable project administration; Plans for dissemination.

Data collection and management: Design and Pretesting of measuring instruments (reliability and validity of instruments);training of interviewers; quality control of measurements; computerization, checking and validating, measurements; the issue of missing observations, statistical summarization of information; testing of hypothesis.

Analysis & presentation of Results; Report writing and format.

PHY 231: Anatomy physiology III - Chemistry Physiology

- **Anatomy physiology III: 4 Appropriations (60hours); L, T, SPW**

1. Musculoskeletal System

- Musculoskeletal system: the bone and its structure, different types of bone parts - cartilage - joints.
- The muscular system: histology and physiology of striated muscle and smooth muscle

2. Urinary system

- Macroscopic anatomy
- Renal physiology.
- The Genital system
- The genital system female: bone basin, articulation, genital organs internal, genitals external, ovaries and menstrual cycle.

- The genital system masculine: testicles (anatomy, histology, endocrine function), track excretory and glands annexs, vas deferens, seminal vesicle, ejaculatory duct, prostate, glands of cut, penis and semen.

- **Physiological Chemistry: 2 credits (30 hours); L, T, SPW**

1. Flow of Genetic Information: DNA replication, transcription, translation. - Structure and role of proteins
2. Regulatory proteins, receiver, etc.
3. Regulation of the metabolism of carbohydrates, lipids, proteins and amino acids.

PHY 232: Mineral Chemistry - Organic Chemistry

- **Mineral chemistry: 1.5 credit (22.5 hours); L, T, SPW**

1. **Fundamental Concepts**
   - Tétravalence of carbon
   - Carbon Chain linear cyclic,
   - Concept of isometry
   - Parts List
2. **Simple concepts on the compounds multifunctional: Acids Alcohols, phenol Acids, amino acids, etc.**

- **Organic Chemistry: 1.5 credit (22.5 hours); L, T, SPW**

General concepts on:

- The saturated hydrocarbons: methane;
- Unsaturated hydrocarbons: ethylene, acetylene;
- The aromatic hydrocarbons: cHCMoroform;
- The halogen derivatives of hydrocarbons trichlorethylene ;
- The alcohols methanol, ethanol;
- The phnols;
- The aldehydes: formaldehyde;
- The ketones: acetone;
- The organic acids: acetic acids;
- The amines, methylamine;
- The acids: aniline.

PHY 233:Psychology applied to Physiotherapy

- **Applied psychology to the physiotherapy: 2 credits (30 hours); L, T, SPW**

1. Motivation to short and long term
2. Study of emotions and emotional reactions in a situation of physiotherapy
3. Patient Relationship unto physiotherapy
4. Psychology of the disabled

5. Psychomotricity
6. Foundation of the psychomotricity
7. Body Diagram
8. Spatializer
9. Organization-temporal.

PHY 234: Physiotherapy and rehabilitation Methodology II - Elements of materials and methodology of motor activities

- **Methodology of physiotherapy and rehabilitation II: 3 credits (45 hours); L, T, SPW**
  1. The theory and practice of articular mobilizations (members and spine)
  2. Methodology of the CCA (muscle, articular, functional, quality of life)
  3. Methodology of the physiotherapy and rehabilitation (of muscle strengthening and stretching and postures)
  4. Mechanical adjuvants in physiotherapy (mécanothérapie)
  5. General principles of rehabilitation
- **Elements of materials and methodology of motor activities: 3 credits (45 hours); L, T, SPW**

  6. Didactic concepts of basis
  7. Fundamental Positions - Movements
  8. Description of exercises unto practical aspects of presentation of the exercises and correction: work with video and autocorrection

PHY 235: Special Pathologies and Specific Physiotherapy I - IEC 2

- **Special pathologies and specific physiotherapy I: 3 credits (45 hours); L, T, SPW**

1. Pathology respiratory Special

- Physiological reminder of the complications respiratory functional with means of assessment and therapeutic opportunities, including using the physiotherapy;
- Review of major respiratory syndromes and the respiratory pathology common, the emphasis being on the Diseases obstructive and restrictive.

2. Special pathology cardiac vascular and

- Disease of the Heart and Vessels General characteristics, methods of diagnosis, treatment principles;
- Importance of the prevention and rehabilitation of cardiovascular disease.

3. Neuromuscular, including seminars

- Affection of the muscle and of periphral nerve;
- Spinal cord injury trauma or other;

- Consequences of the lesions of the central nervous system interesting;
- Brain structures and cerebellar;Overview of the development of the engine of the infant and its implications in the genesis of the Cerebral Palsy.

➢ **IEC 2: 1 credit (15 hours); L, T, PW**

1. Review of problems of community
2. Prioritization of problems
3. Planning Execution unto
4. Communication technologies
5. Health Promotion

PHY 236: Clinical Internship II

➢ **Clinical internship**

PHY 237: Medical English - Medical French -

➢ **English and French: 1 credit (15 hours); L, T, SPW**

1. Conversation in English and French language specific to the care
2. Translation of medical terms, of the medical prescription, technical data sheets and protocols, notices of dispenNUSg medicines
3. The parts of the human body
4. The bodies
5. The different systems

➢ **English and French: 1 credit (15 hours); L, T, SPW**

- The human body

1. The pathologies by systems
   - Urinary system;
   - Cardiovascular System;
   - Digestive system;
   - Endocrine system;
2. The dispensing of drugs

➢ **English and French: 1 credit (15 hours); L, T, P, SPW**

-The course consists of two parts: The first is devoted to the revision of the key elements of the English grammar and french ; the second part consists of thematic units which are aimed at the control of these structures by means of activities focused on the oral expression.

PHY 241: General Economy - Hospital management

➢ **General Economics: 2 credits (30 hours); L, T, SPW**

1. International economic relations

- Areas of economic exchanges;
- Specialization and international trade;

- International payment;
- Construction.

2. The economic policies

- The objectives: growth, employment, prices, external trade;
- The means: Policies fiscal, monetary, industrial and employment policy and training.

3. Economic circuit and national accounting

- Institutional Sectors, flow accounts, table (table of the whole economic activity, table input/ ouPHut, table of financial operations), aggregates and ratios.

4. Evolution of the final consumption, gross fixed capital formation (GFCF) and savings.

- **Hospital management: 2 credits (30 hours); L, T, SPW**

1. Health Organization in Cameroon

- Mission of Health training on the national territory: health center, district hospitals, hospitals, central and regional, general hospitals, CHU, private hospitals and clinics laity and confessional, liberal medicine.
- Hospital reform, inter relation with national organizations that contribute to the health and the fight against poverty (other government departments, donors, international organizations, NGOS, associations);

2. Organization of health training, public and private

- Legislation which applies to health training;
- Economic and Financial Management;
- Workforce management Workforce management, staff and the continuous training;
- Management of care and drugs.

PHY 242: Priority Health Programs

- **Priority Health programs: 2 credits (30 hours); L, T, SPW**

1. Malaria, tuberculosis, river blindness; etc.

2. The educational program in health

- Definition;
- The components;
- Preparation;

3. Monitoring and motoring an educational program

- Definition;
- Principle;

4. The supervision of an educational program in health

- Definition;

- Supervision and motoring;
- Why the supervision?
- The steps of the Supervision;
- The styles of supervision:
- Autocratic supervision;
- Anarchic supervision,
- Democratic oversight;
- The benefits of the supervision.

➢ **Vaccination: 1 credit (15 hours); L, T, SPW**

1. Public Health, Individual, Community
2. Education, information, teaching, learning
3. Health, disease
4. Quality of Life, mode of life
5. Prevention, health promotion, health education
6. Logic of health, model of health, behavior;
7. Approach by problem, by situation
8. Axiological dimension, theoretical, methodological of the EPS
9. Health Analysis, Needs, context, of situation
10. Intervention, evaluation, research
11. Normative schedules, encouragement, by emergence, etc.

PHY 243: Special Methodology of Physiotherapy I

➢ **Special methodology of physiotherapy I: 3 credits (45 hours); L, T, SPW**

1. Respirology
2. Orthopedic
3. Traumatology
4. Rheumatology
5. Neurology
6. Depth Question of Rehabilitation
7. Psychiatry
8. Uro-gynecology
9. Vascular (arterial, venous and lymphatic)
10. Oncology including palliative care

PHY 244: Special pathologies and specific Physiotherapy II

➢ **Pathology abdominal special: 1 credit (15 hours); L, T, SPW**

- Description of the main diseases of the digestive tube, with reminder of anatomy and pathophysiology, as well as the notions of Semiology and therapeutic attached to it.

➢ **Pathology and functional rehabilitation surgical special of the child: 1 credit (15 hours); L, T, SPW**

1. Traumatology

2. Bone Infections (osteomyelitis)
3. Pathology of the Hip (dislocation, spur physiology, Legg-Calvé-Perthes)
4. Pathology of Engineering (diseases of growth, génuvalgum/valgum, subluxation, influence of sport)
5. Pathology of the foot (positional foot, foot Bot, hollow foot, Flat Foot)
6. Inequality of length (origin and treatment)
7. Pathology of the upper member (obstetric paralysis, congenital malformations)
8. Pathology of the vertebral column (scoliosis, kyphosis, spondylolysis)

- **Pathology Medical special of the child: 1 credit (15 hours); L, T, SPW**

1. The Pediatrics of is the medicine of the child. That is to say the science of the development of the Healthy Child and ill, often linked to the confrontation between a genetic program and its physical environment social and
2. As regards the pathology, the course is specifically oriented toward the disorders of growth and puberty, the risks related to the environment, obesity, respiratory, neuromuscular, Diabetes

- **Special pathology rheumatic disease, physio Technical, including elements radiological and practical work of physio technique: 2 credits (30 hours); L, T, SPW**

1. The various physical methods used for therapeutic purposes (to the exclusion of the radiotherapy): electrotherapy, use of electromagnetic waves, vibrothérapie, Hydrotherapy including the pélothérapie
2. The rheumatic pathology: Infectious arthritis and inflammatory, arthropathies, degenerative diseases (osteoarthritis, articular rheumatism, tendonitis, bursitis, etc.), bone diseases (osteoporosis, ostéornalacic, Paget; etc.)

PHY 245: Special Pharmacology of Physiotherapy II

- **Special pharmacology of physiotherapy II: 4 appropriations (60 hours); L, T, SPW**

1. The medicines of the inflammation

- Anti-inflammatory non-steroidal;
- Anti-inflammatories steroidal;
- Antibacykinines;
- Antileucotriennes;
- Aspirin;

- The paracetamol;

2. The other painkillers

PHY 246:Community Internship I

- **Community Internship I : 6 credits (90 hours); L, T, SPW**

PHY 247: Medical Law

- **Labor law: 1 credit (15 hours); L, T, SPW**

1. Definition of the right of labor, birth and evolution of labor law and sources
2. The contract of work (conclusion, implementation and rupture)
3. The conflicts of work (individual and collective)
4. The delegate of the staff, unions
5. Work accidents and occupational diseases
6. The hygiene and safety in the workplace

- **Administrative Law: 1 credit (15 hours); L, T, SPW**

Nature and function of the management of personnel, training and staff development, supervision and evaluation of employees; assessment of jobs and administration of salaries; trade union organizations and labor legislation, collective bargaining, grievance and strikes; administration services to employees. Practical application in industrial administration, public and the hospital.

- **Civil law: 1 credit (15 hours); L, T, SPW**

Society, ethics and the law; the foundation of the right and of the social life; concepts of health and education; place of the body in moral and in law; the right and duties of the individual and of the Community (right of patients, the rights of the person and the health care system); privatization and publicisation of health, respect for private life and social cost of health. Autonomy, participation, etc.

PHY 351: Neurophysiology - Human and Special Metabolic I - Economics Health

- **Neurophysiology Human metabolic Special: 4 appropriations (60 hours) ; L, T, P, SPW**

1. The different floors of the shaft digestive, and its glands Annexs, are analyzed on the plan of the traction, of metabolic exchange processes and coordination a hormonal
2. The functions of the kidney (filtration, reabsorption, secretion, concentration of the urine, acidification of the urine) are studied

- **The economics of health: 2 credits (30 hours); L, T, P, SPW**

1. **Basic concepts in health economics:** supply, demand, the financing of the health
2. **Concept of the market in health:** the supply of health care; request of care; financing of care
3. **The funding in health:** social protection, pooling of Health financing
4. **Health Financing in Cameroon** : Community funding (CNPS, mutual health and system put in place by the state for public servants); non-Community funding (budget of the ministries concerned, public health and other…); bilateral and multilateral cooperation (NGOS, other donors, …)
5. **The Health Planning**
6. **Health system and their assessment:** effectiveness, efficiency, cost, effectiveness/efficiency, cost / efficiency

PHY 352: Human Neurophysiology including the Physiology of Movements

- **Human Neurophysiology including the physiology of movements: 3 credits (45 hours); L, T, P, SPW**

1. Nervous content and mechanisms for integration in the central nervous system
2. Tracks ascending and descending
3. Sensory Receptors, including the mechanisms of translation
4. Organization of the traction and the role of the Cerebellum
5. Sensory organs
6. Cognitive and driving memories

PHY 353: Special Methodology of Physiotherapy

- **Special methodology of Physiotherapy: 3 credits (45 hours); L, P, SPW**

PHY 354: Special Gynecological Pathology

- **Special gynecological pathology : 3 credits (45 hours); L, T, P, SPW**

1. Reproductive Endocrinology, puberty, pregnancy, menopause
2. Physiology of pregnancy, fertilization, post-partum
3. The pain in the course of the work and its treatment
4. Affection gynecological surgical stress urinary incontinence of

PHY355 : Community Internship II

- **Community Practicum 2: 6 credits (90 hours); P, SPW**

PHY356:Clinical Internship III

- **Clinical Internship 3: 6 credits (90 hours); P, SPW**

PHY 357: Information and Communication Technology 2

- **Information and Communication Technology 2 : 3 credits (45hours)**

1. Creation of a simple database with a spreadsheet (How to Give a name to a cell range)
2. Validation of Data in a range of cells on a spreadsheet
3. Creation of the statistical tables simple (modality, workforce, frequency) and automatic filling with functions such as NB, NB.If and NB.If.ENS, Average, Sum, if
4. Creation of graphics from statistical tables
5. Presentation and use of a statistical software (ex: Epi Info)
6. Creation of a questionnaire on EPI info or other
7. Data entry and analysis
8. Telemedecine
9. Definition of the concepts of the computer network
10. Presentation of the types of media and networks
11. Presentation of Internet (Connection, research, download)
12. Networks withoutwires
13. Learning of a software application(Microsoft PowerPoint)
14. Numbering system
15. Computer Security: Virus and antivirus

PHY 361: Professional Project

- **Project Mentee: 4 appropriations (60 hours); L, T, P, SPW**

It depends on the theme of work of the learner; it must be drafted in accordance with the following plan:

1. Summary
2. Introduction: 2 pages maximum. The introduction, it is spring loaded to the problematic
    - One poses the question of research,
    - One fixes the Assumptions;
    - One fixes the general objective;
    - It sets out the specific objectives and sets out the plan.
3. Chapter I, II: The literature review (Review of the literature)
4. Chapter II, III: The methodology
5. Chapter III, IV:
    - Presentation of the results and discussion

- Conclusion and recommendations;
- Bibliography;
- Annexs.

PHY 362:IEC 3 - Health Promotion

- **General hygiene: 1 credit (15 hours); L, T, P, SPW**
  - Bodily hygiene;
  - Dress hygiene;
  - Food hygiene;
  - Hygiene of the habitat.
- **Hospital hygiene: 2 credits (30 hours); L, T, P, SPW**

1. General principles

- Epidemiology;
- Sources and vehicles;
- Contaminant agents;
- Mode of transmission.

2. Development of a hospital

- Monitoring and reporting of any infection;
- Removal of Contamination;
- Architectural consideration;
- Bacteriological control.

3. Role of the bacteriologist in the fight against the hospital infection

- Personal hygiene;
- Collection;
- Transport and treatment of samples;
- Treatment of residues;
- Washing and sterilization of equipment;
- Collaboration with the other services;
- General hygiene of the service of medical analysis.

- **IEC III: 1 credit (15 hours); L, T, P, SPW**

- **Health Promotion: 1 credit (15 hours); L, T, P, SPW**

1. Health
2. Education for health and health promotion
3. Evolution of Concepts
4. A Determinant of Health
5. Approach to health promotion 'Fall of Ottawa)
6. Health education
7. Health education
8. Education for Health
9. The levels of action for health promotion

10. The implementation of the actions of health promotion
11. Evaluation of health promotion.

PHY 363: Apparatus and Prosthesis in Physiotherapy

- **Apparatus and prosthesis in Physiotherapy: 3 credits (45 hours); L, P, SPW**

1. Prostheses senior members and lower limbs and orthotics
2. Apparatus for the disabled and their revalidation

PHY 364: Implementation professional situation related to special pathologies I

- **Implementation professional situation related to special pathologies I: 4 credits (60 hours); P, SPW**

PHY 365: Implementation professional situation related to special pathologies II

- **Implementation professional situation related to special pathologies II: 4 credits (60 hours); P, PW**

PHY 366: Clinical internship IV

- **Clinical internship 4: 6 credits (90 hours); P, SPW**

PHY 367: Professional Ethics and Deontology

Objective: At the end of the course, the student should be able to know those values and obligations which practice in the profession.

Content: Nurse, Patient, nurse/patient relationship, obligations of the nurse, rights of the patient, rights and responsibilities of the nurse, deontology, ethics, etiquettes, patient reception in hospital, nurse/patient-relative relationship. Medical jurisprudence, lab practice and the law, forensic nursing, malpractice, civic duties, organization of Government, Common law, labour law, Criminal Law,etc.

Health care Ethics

- Morality and Ethics: Norms, Deviances, Religion, Values, Beliefs, Cultures
- Bioethics
- MLS Ethics
- Moral Development
- Ethical Principles: Autonomy, Freedom, Privacy, Confidentiality, Beneficence, Fidelity, Motivation, Justice, Veracity and Responsibility.
- Code of Ethics health workers.

- Application of Ethics to MLS Practice: Respect For Life And Death, The Concept Of Dignity, Euthanasia, Human Rights, Rights of The Child, Rights of The Elderly, Patients Rights
- Ethical Decision Making Frameworks and their Application in diagnosis
- Context And Conflicts With Bioethical Standards

Patient Rights:

- Respect for life and death, the concept of dignity, euthanasia
- Care for dying patients: Palliative care, Confidentiality, Professional secrecy, Medical Research and Nursing care ethics.
- Code of ethics.
- Health Employee/employer contract law for health practitioners
- MLS and the law

Introduction to Law and Fundamental Rights

Law

- Sources of law
- Law and enabling Acts (text of application)
- The concept of legal personality
- Civil responsibility (contract, TORT)
- Criminal responsibility
- The court and their jurisdictions
- Labor law: formation and execution of labor contract, remuneration, condition of work, obligation of the employer and employee, termination of labor contracts

Fundamental Rights

- The concepts of human rights
- Sources of human right
- Major international conventions of human rights
- International conventions relating to women
- Children and the rights of the minorities
- The role of the judiciary and the legislative in the protection of human rights
- The Cameroon national commission of human rights and liberties
- The civil society NGO's and the protection of human rights

Law for Medical laboratory personnel

- Definition of Law, public law, private law
- The client's and MLS personnel's' constitutional right
- Administrative law related to licensing and regulation of health practice

Field : MEDICAL AND BIOMEDICAL SCIENCES

Specialty :

OPHTALMIC TECHNICIAN

Field:	MEDICAL AND BIOMEDICAL SCIENCES

Specialty:	Ophthalmic Technician

1. The objective of the training

The mission of this program is to train highlyy qualified ophthalmic technicians capable of providing holistic high quality ophthalmic assistance in diverse clinical and academic settings locally, nationally and internationally.

2. The powers sought

→ **Generic skills**

- Be responsible and reflexive;
- Have empowered gestural and capabilities; relational
- Recognize its emotions and be able to use with the acquired professional necessary;
- Have a trust and a proven insurance;
- Have the critical capacity and questioning;
- Develop an ethics and a normal professional;
- Makethoughtfuldecisions;
- Act with autonomy and responsibility in the fields of well delimited its function.

→ **Specificskills**

- Provide primary vision care ranging from sight testing and correction to the diagnosis and management of vision changes
- Practice optometry technology, which primarily involves performing eye exams and vision tests
- Detect certain eye abnormalities and prescribing and dispensing corrective lenses
- Assist the ophthalmologists and eye surgeons

3. OUTLETS

The ophthalmic technicians will be able to work in:

- Eye Clinics
- Optometry Department
- Refraction centers and academic settings etc.

4. Organization of the Teachings

Semester 1

Field : Medical and Biomedical Sciences		Specialty: Ophthalmic Technician					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
OTE111	Anatomy-Physiology I /Cell Biology - Histology	30	15	10	5	60	4
OTE112	Microbiology I : Bacteriology-Parasitology /General Chemistry & Biochemistry	40	15	15	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
OTE113	Fundamentals of Nursing I : Overview-Concepts-History-Theories	45	15	10	5	75	5
OTE114	Social Sciences I : Medical Sociology, Anthropology & Psychology	45	20	5	5	75	5
OTE115	Human Development Across The Life Span	40	10	5	5	60	4
OTE116	Clinical Placement I	/	/	60	/	60	4
TransversalsCourses 10% (1 UC) 3 credits 45 hours							
OTE117	- ICT I Functional English and french	25	5	10	5	45	3
Total		**285**	**75**	**12**	**78**	**450**	**30**

Semester 2

Field : Medical and Biomedical Sciences		Specialty:OphthalmicTechnician					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
OTE 121	Anatomy-Physiology II	45	20	5	5	75	5
OTE 122	Microbiology II: Virology-Mycology-Immunology	35	15	5	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
OTE 123	Fundamentals Of Nursing III: Nursing Sciences and First Aid	35	15	5	5	60	4
OTE 124	Public Health: Epidemiology-Demography-Environmental Sanitation & Health Promotion	35	10	10	5	60	4
OTE 125	Medical Nursing I	40	10	5	5	60	4
OTE 126	Clinical Placement II	/	/	90	/	90	6
TransversalsCourses 10% (1 UC) 3 credits 45 hours							
OTE127	Professional Ethics And Deontology	30	5	5	5	45	3
Total		**235**	**56**	**94**	**65**	**450**	**30**

Semester 3

Field : Medical and Biomedical Sciences		Specialty: Ophthalmic Technician					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
OTE231	Ocular Anatomy & Physiology- Theory & Practical	45	15	10	5	75	5
OTE232	General Pharmacology Clinical Pharmacology	30	15	10	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
OTE233	Visual Optics I- Theory & Practical, Lighting & The Eye- Theory & Practical	50	20	15	5	90	6
OTE234	Clinical Refraction I- Theory & Practical	25	10	5	5	45	3
OTE235	Ophthalmic & Optical Instrumentation & Procedure I- Theory & Practical	40	10	20	5	75	5
OTE236	Clinical Placement III(optician shop)	/	/	60	/	60	4
TransversalsCourses 10% (1 UC) 3 credits 45 hours							
OTE237	- French and English for Medical Profession	30	5	5	5	45	3
Total		**230**	**65**	**93**	**62**	**450**	**30**

Semester 4

Field : Medical and Biomedical Sciences		Specialty: Ophthalmic Technician					
Code	Courses Titles	Hourly Volume					Number Of Credit
		L	T	P	PW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
OTE241	Physical Optics- Theory & Practical	35	15	5	5	60	4
OTE242	Ocular Pathology And Microbiology-Theory & Practical, Geometrical Optics- Theory & Practical	45	15	10	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
OTE243	Visual Optics II- Theory & Practical	45	20	5	5	75	5
OTE244	Clinical Refraction II- Theory & Practical	35	15	5	5	60	4
OTE245	Ophthalmic & Optical Instrumentation & Procedure II- Theory & Practical	25	10	5	5	45	3
OTE246	Clinical Placement IV Introduction to Operational Research	15	10	60	5	90	6
TransversalsCourses 10% (1 UC) 3 credits 45 hours							
OTE247	BiostatisticsI-Health Information Systems	30	8	4	3	45	3
Total		**227**	**70**	**100**	**53**	**450**	**30**

Semester 5

Field : Medical and Biomedical Sciences		Specialty: Ophthalmic Technician					
Code	**Courses Titles**	**Hourly Volume**					**Number Of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
OTE351	Ocular Disease I (Anterior Segment Disease)	35	15	5	5	60	4
OTE352	Binocular Vision & Ocular Motality, Health Care Management	45	15	10	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
OTE353	Contact Lens I- Theory & Practical	35	15	5	5	60	4
OTE354	Ophthalmic Lens & Dispensing Optics- Theory & Practical	35	15	5	5	60	4
OTE355	Low Vision Aids & Visual Rehabilitation- Theory & Practical	35	15	5	5	60	4
OTE356	Clinical Placement V (optical department)	/	/	70	20	90	6
TransversalsCourses 10% (1 UC) 3 credits 45 hours							
OTE357	Medical Law, Legal and Occupational Health BiostatisticsII	30	5	5	5	45	3
Total		**190**	**37**	**180**	**43**	**450**	**30**

Semester 6

Field : Medical and Biomedical Sciences		Specialty: Ophthalmic Technician					
Code	**Courses Titles**	**Hourly Volume**					**Number Of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
OTE361	Ocular Disease II (Posterior &Neuro-Eye Disease)	25	10	5	5	45	3
OTE362	Health Economics, Systemic Condition & The Eye	55	20	10	5	90	6
Professional courses 60% (4 UC) 18 credits 270 hours							
OTE363	Contact Lens II- Theory & Practical	35	15	5	5	60	4
OTE364	Public Health & Community Optometry	35	15	5	5	60	4
OTE365	Applied Optometry &Orthoptics- Theory & Practical	35	15	5	5	60	4
OTE366	Clinical Placement VI (operational research)	/	/	70	20	90	6
TransversalsCourses 10% (1 UC) 3 credits 45 hours							
OTE367	Ethics & Civic Education, Research Project	25	10	5	5	45	3
Total		**196**	**49**	**153**	**52**	**450**	**30**

5. Courses content

OTE111: Anatomy-Physiology I/Cell Biology-Histology

Content:

Cell structure and function

Physiology of the muscles and nerve: Physiology of muscles function; Types of contractions, all or none principle; Muscle tone, fatigue, Nerve cell and Electro-Physiology; Degeneration of nerve; Reaction of Degeneration.

Physiology Of Blood And Cvs: Composition of blood, formation and function of red blood corpuscles; Types of contractions, all or none principle; Formation & function of leucocytes; The Plasma Proteins; Blood Groups; Heart vessels & Cardiac Muscles; Blood pressure, and factors maintaining and affecting circulations.; Cardiac cycle and ouPHut, electro- cardiogram; Coagulation of blood and Reticuloendothelial system.

Respiratory System: Mechanism of respiration- internal and external; Nervous control of Respiration; Factors affecting respiration; Capacity and lung volumes (vital capacity, tidal air, residual air, reserve air, minimal air etc); Transport of gases and hypoxia.

Introduction to Anatomy, terms and terminology; Regions of Body, Cavities and systems; Surface anatomy – musculo-skeletal, vascular, cardiopulmonary system; General Embryology

Musculoskeletal system: Connective tissue & its modification, tendons, membranes, special connective Tissue; Bone structure, blood supply, growth, ossification, and classification; Muscle classification, structure and functional aspect; Joints – classification, structures of joints, movements, range, limiting factors, stability, blood supply, nerve supply, dislocations and applied anatomy

Upper extremity: Bony architecture; Joints – structure, range of movement; Muscles – origin, insertion, actions, nerve supply; Major nerves – course, branches and implications of nerve injuries; Development of limb bones, muscles and anomalies

Lower Extremity: Bony architecture; Joints – structure, range of movement; Muscles – origin, insertion, actions, nerve supply; Major nerves – course, branches and implications of nerve injuries; Development of limb bones, muscles and anomalies

Spine and thorax: Back muscles - Superficial layer, Deep muscles of back, their origin, insertion, action and nerve supply; Vertebral column – Structure & Development, Structure & Joints of vertebra; Thoracic cage

Head and neck: Cranium; Facial Muscles – origin, insertion, actions, nerve supply; Temporo mandibular Joints – structure, types of movement

Cardiovascular system: Circulatory system – major arteries and veins of the body, structure of blood vessels; Heart structure, positions, chambers, valves, internal & external features; Blood supply to heart; Conductive system of heart; Lymphatic system; Circulation, structure & functions; Lymph nodes

Respiratory system: Structure of upper and lower respiratory tract; Thorax: Pleural cavities & pleura; Lungs and respiratory tree; Heart and great vessels; Diaphragm

OTE112: Microbiology I: Bacteriology-Parasitology / General Chemistry & Biochemistry

- **Bacteriology-Parasitology**

Objectives: This course is designed to give a basic understanding of microorganism. Upon successful completion of the course, the student should be able to:

- Have a general notion of Microorganisms;
- Know the useful and harmful effects of microbes to humans;
- Differentiate prokaryotes from Eukaryotes;
- Perform Preliminary basic laboratory techniques for identifying Microorganisms.

Content:

- General introduction to microbiology
- Importance of Microbes
- Cell types: Prokaryotes and Eukaryotes
- History of Development of MCB
- Structure and Function of a Composite Bacteria cell
- Classification and Identification of Microorganisms
- Criteria used for classification of Microorganisms

Parasitology:

Introduction to Parasitology

- Definition of some terminologies used in Parasitology
- Transmission and diseases caused by parasites
- Classification and characteristics of parasites
- Life cycles of some parasites (aetiologic agent, mode of transmission, infective and diagnostic stages)e.g*Entamoebahistolytica, Giardia lamblia, Trichomonasvaginalis, Leishmaniaspp, Trypanosomaspp,* Malaria parasite,*Ascarislumbricoides, Hookworms, Taeniaspp, Schistosomaspp*
- Quality assurance in the Parasitology laboratory
- Basic techniques used in the identification of parasites

Introduction to the laboratory

- levels of laboratories
- laboratory safety
- First Aid in the laboratory

Introduction to Haematology

- Overview
- Red blood cell Indices
- White blood cell Indices
- Blood groups and Transfusion
- ABO blood group system

- Rhesus Factor
- Erythrocyte Sedimentation rate

Introduction to Medical Parasitology

- Definition of basic terminologies in Parasitology
- Host/ Parasite Interactions
- Routine stool examination
- Examination of Malaria parasite

Introduction to Clinical Chemistry

- Specimen collection and processing
- Explanation of clinical Chemistry results: Blood sugar, heart disease risk, Iron status, Kidney Function tests, Electrolytes, Acid-base balance, Bone metabolism, Lipid panel, Liver Function tests, Cancer screening, Thyroid function and Urinalysis

Introduction to Bacteriology

- Bacterial structure
- Bacteria cell shape and arrangement
- Laboratory diagnosis of gonorrhoeae
- Laboratory diagnosis of tuberculosis
- Laboratory diagnosis of Urinary Tract Infections
- Laboratory examination of V/S and U/S

- **General Chemistry & Biochemistry**

Objectives: The student should be able to:

- Describe the role of chemistry in modern life;
- Define some of the physical properties of drugs, e.g., solubility, melting point, boiling point and acid–base properties;
- Explain the terms pH, P^{ka}, buffer and neutralization.

Atomic structure and bonding:

- Describe the fundamental concepts of atomic structure;
- Explain various aspects of chemical bonding;
- Discuss the relevance of chemical bonding in drug molecules and drug–receptor interactions.

Contents: Physical Chemistry

- General introduction: Role of chemistry in modern life.
- **Atomic Structure:** orbital's and electronic configurations
  - Aufbau principle.
  - Pauli exclusion principle
  - Hund's rule
  - Hybridization
- **Atomic Structure and Bonding**
  - Describe the fundamental concepts of atomic structure.
  - Explain various types of chemical bonding.
  - Electronegativity and chemical bonding

- Bond polarity and intermolecular forces.
- Understand the significance of chemical bonding in drug-receptor interactions.

- **General Review of the Periodic Table**
  - Periodic Law
  - Alkali metals (group I)
  - Some medical uses of group I elements.
  - Alkaline-earth metals (group II)
  - Some medical uses of group I elements.
  - The transition elements
  - Medical uses of some transitional elements.
  - Halogens (group VII)
  - Medical effects of halogens.
  - Isotopy
  - The mole concept
  - Using moles to balancing & write equations
  - The empirical & molecular formulas of compounds
  - Allotropy
  - Alloy
  - Absorption & emission spectra
  - Radioactivity and Radiations
- **Acids and Bases**
- Volumetric analysis

Organic Compounds:

- Carbohydrates: Classification, types and functions
- Lipids and membranes: definitions, types, chemistry, nomenclature properties and classification
- Amino acids and Proteins: definitions, types, chemistry, properties, notion of peptide basics.
- Structural levels of Proteins, biological functions.

OTE113: Fundamentals of Nursing I: Overview-Concepts History-Theories

Objective: At the end of this course, the student should master the concepts and understand the evolution of nursing;

Content:

I. <u>Clarification of concepts</u>

- Health,
- Sickness ;
- Life,
- Death,
- The health continuum ;
- Signs and sickness;

- Need ;
- The concept of paradigme,
- Theories ;
- Modeles,

II. History of the nursing profession.

Objective: To understand the steps of the evolutive process of nursing,
Content:

- Health in primitive cultures;
    - Before christ ;
    - Middle age,
    - Florence Nightingale'sera ;
- Organisation nursing ;
- Role of the nurse;
- History of nursing in Cameroun.
- National order of paramedical personnels.
- View of the other professions.

OTE114: Social Sciences I: Medical Sociology, Anthropology & Psychology

- **Objective:**
    - To outline key ideas about dysfunctional patterns of behavior.
    - To discuss maladjusted responses resulting from defects in personality development and suggest ways that nurses can help.
- **Content:**
    - Introduction to psychology
    - Major steps of life:-
    - Emotional, Intellectual, psychomotor and psychosocial evolution of the individual: First age, second age, preschool, school, adolescence, adulthood, aging.
    - Body structure and body image
    - Personality
    - Dynamic aspects of personality, unconscious, instinct, repression, motivation.
    - Defense mechanism and adaptation.
    - Emotional states: Feelings, emotions, fear, anger, distrust, anxiety.
    - Comportments and behaviors.
    - The different modes of relationship: social, educational, cooperative, authority, dependency, acceptance, mothering.
    - Evolution of life and of the human being in his psychological dimensions.
    - The doctor – patient relationship: specificities.
- **Sociology:**
    - Introduction to sociology

- Concept of group: Social groups (family, work groups, institution).
- Dynamics of small groups
- Dynamics of conflicts: Leaders
- Communication and communication networks
- Evolution of life and the human being in his social dimensions.

- **Anthropology / Ethnology**
  - Notions of anthropology and ethnology
  - Anthropology, ethnology
  - Customs and cultural PWnomena
  - The innate and the acquired myths and beliefs
  - Cultural attitudes to health, illness, death.

OTE115: Human Development Across The Life Span

Objective: To outline key ideas about dysfunctional patterns of behaviour. To discuss maladjustive responses resulting from defects in personality development and suggest ways that nurses can help.

Content:

- Introduction to psychology;
- Major steps of life;
- Emotional, Intellectual, psychomotor and psychosocial evolution of the individual; First age, second age, preschool, school, adolescence, adulthood, aging;
- Body structure and body image ;
- Personality ;
- Dynamic aspects of personality, unconscious, instinct, repression, motivation;
- Defense mechanism and adaptation;
- Emotional states: Feelings, emotions, fear, anger, distrust, anxiety;
- Comportments and behaviours;
- The different modes of relationship: social, educational, cooperative, authority, dependency, acceptance, mothering;
- Evolution of life and of the human being in his psychological dimensions;
- The doctor – patient relationship: specificities.

OTE116: Clinical Practice I (Immersion)

OTE117: Functional English and French

- **English and French expression: 2 credits (30 hours); L, T, P, SPW**

1. **Form of words in French**
   - Prefix, radical;
   - Root, suffix.

2. **Explanation of words and group of words**
3. **Morphosyntax and rhetoric**
    - Components and structure of the sentence:
        - Simple sentence;
        - Complex sentence;
        - Sentence composed.
    - Figures of style:
        - Figures of analogy;
        - Figures of amplification;
        - Figures of opposition;
        - Figures of mitigation.
4. **Administrative correspondence and professional**
        - The different parts of a administrative correspondence and the administrative style
        - Professional Correspondence:
        - Note of service;
        - Record (activity, mission);
        - The report (activity, mission).
5. **Professional correspondence to individual dominance**
        - Application for employment;
        - CV;
        - Letter of motivation.
6. **Methodological Considerations on the written exercises**
    - French composition;
    - Contraction of text:
        - French composition: Reminder methodological and implementation;
        - Contraction of text: methodological reminder and application.
7. **Study of the communication situations.**
        - Identification of the factors in the situation of communication (transmitter, receiver, code, channel, message, context);
        - Situation of communication and verbal interactions;
        - Study of the elements para verbal cues (kinesthetic, proxémiques, MIMO-gestural, etc.;
        - Identification and handling of figures of expression and thought metaphors, irony. Satire, parody, etc.).

- **Technique of the information and of the communication 1: 1 credit (15 hours); L,T, SPW**

1. Concepts and architecture of computers
2. Definitions: computing, information, computer, data, program, software, drivers

3. System of enumeration of base 2, the unit of measure of the information and its multiple
4. Components of the computer (hardware and software)
5. Study of an operating system
6. Study of a text treatment software: Microsoft Word
7. Study of a spreadsheet/Microsoft Excel
8. Study of a presentation software: Microsoft PowerPoint

OTE121: Anatomy and Physiology II

Among the basic sciences of medicine fundamental to the practice of all branches, the most important are anatomy and physiology. Their studies have unique applications to all branches of medicine and extracts pertinent to all branches are higHCMighted.

Nervous system: Classification of nervous system; Nerve – structure, classification, microscopy with examples; Neurons, classification with examples Simple reflex arc; Parts of a typical spinal nerve/Dermatome; Central nervous system – disposition, parts and functions; Cerebrum; Cerebellum; Midbrain & brain stem; Blood supply & anatomy of brain; Spinal cord- anatomy, blood supply, nerve pathways; Pyramidal, extra pyramidal system; Thalamus, hypothalamus; Structure and features of meninges; Ventricles of brain, CSF circulation; Development of nervous system & defects; Cranial nerves – (course, distribution, functions and palsy); Sympathetic nervous system, its parts and components; Parasympathetic nervous system

Sensory system: Structure and function of- Visual system; Auditory system; Gustatory system; Olfactory system; Somato sensory system

Digestive system: Parts of digestive system; Abdominal cavity – divisions; Muscles of abdominal wall; Liver; Pancreas; Spleen; Alimentary canal; Gall bladder; Intestine (small & large)

Urinary and Reproductive system: Urinary system; Pelvic floor, innervations; Kidney, Ureter, bladder, urethra

Genital system – male and female; Reproductive system of male; Reproductive system of female

Endocrine system: Pituitary gland; Thyroid; Parathyroid.

Digestive System: Introduction to digestive system, Alimentary functional anatomy; The salivary glands; The stomach and its secretion; The bile; The small intestine; Digestive processes and functions of liver; Absorption, Metabolism, Basal Metabolism, Food requirements; Metabolism.

Endocrine system: Physiology of the endocrine glands (pituitary, pineal body, Thyroid, Para thyroid, adrenal, gonads, thymus and pancreas etc.).

Physiology of urogenital system: Physiology of kidney and urine formation; Constituents of normal urine etc; Kidney function tests. Miscellaneous aspects renal physiology, Micturition, Male and female reproductive organs.

Skin: The skin structure and its function; Temperature regulation.

Nervous system: Reflex arc; Physiology of the central nervous system; Posture, locomotion and Equilibrium; Reflexes; Physiology of the sympathetic and parasympathetic nervous system; Sensory system and receptors; Motor areas, descending and ascending tracts; ANS; Reticular formation Cerebrum, Cerebellum, basal ganglia, thalamus, hypothalamus, CSF and Blood brain barrier; Neuro Muscular Junction

OTE 122: Microbiology II (Virology-Mycology-Immunology)

Objective: This course is designed to give a basic understanding of microorganism. Upon successful completion of the course, the student should be able to:

- Have a general notion of Microorganisms
- Know the useful and harmful effects of microbes to humans
- Differentiate prokaryotes from Eukaryotes
- Perform Preliminary basic laboratory techniques for identifying Microorganisms

Cultivation of bacteria

Types of culture media

Bacteria growth: Batch and Continuous systems, various phases of a bacteria growth curve

Microbial growth requirements: Physical requirements (Oxygen, temperature etc.), Chemical requirements (Nitrogen, Carbon etc.) and Growth factors (Vitamins, amino acids, pyrimidine and purine bases)

Introduction to viruses, General characteristics of viruses, General structure and functions of the various parts of a virus, Classification of viruses: In terms of nucleic acids, morphology, and Viral replication: adsorption, penetration, uncoating etc. Terminologies related to the control of microbial growth (sterilization, disinfection, bacteriostatic, bactericidal etc.)

Introduction to Mycology

- Beneficial and harmful importance of Fungi
- General characteristics of Fungi
- General life cycle of fungi
- Sexual and Asexual reproduction in fungi
- Types of Mycoses
- Laboratory diagnosis of Mycoses

OTE123: Fundamentals of Nursing Sciences II: Nursing Sciences & First Aid

Objective: The student should understand the nursing process;

- **Content:**

1. **The nursing process**
   - Analysis and interpretation of results.
   - The concept of nursing diagnosis;
   - The nurses intervention;

- The nursing care plan and register;

➢ **Nursing care Planification**

2. First Aid

First aid.Definition, concept of first aide, hemorrhage (bleeding), fainting, choking and drowning,

Shock and electrocution, coma (unconsciousness) and heat stroke (sun burn), fractures, sprains and strains and dislocations, poisoning, animal bites and insect stings,

OTE124: Public Health: Epidemiology-Demography-Environmental sanitation& Health Promotion.

Objective: To master of the elements of public health related to epidemiology, demography the environment and health promotion.

➢ **Content**

➢ **Epidemiology**

Epidemiology method, health measurement, epidemiological data, measurement of epidemiological frequency, prevalence, incidence, associated impact of epidemiology, precise and validation of epidemiology, precise problem of sample collection.

➢ **Demography**

Definition, goal of demography, notion of demography, characteristic of the population, notion of type of demography, ratio, ascending pyramid of age, stratify population, interpretation.

OTE125: Medical Nursing I

Objective: To take care of patients in a medical ward, bearing in mind the ethics and the deontology of the profession.

➢ **Content**

1. Medical Nursing

- Clerking
- Guidelines for collecting history
- Importance of health history
- Components of health history taking
- Physical examination (PE)
- Importance of physical examination
- Guidelines for carryout a PE
- Techniques for carrying out a PE
- Vital signs
- Importance of vital signs
- Recording PE and principles guiding recoding of PE
- Guidelines for vital signs

- Technique

a) Temperature
- Clinical thermometer
- Sites for temperature assessment
- Few keys features surrounding temperature

b) Pulse
- Assessing pulse (radial)
- Pulse characteristics

c) Respiratory Rate
- Dyspnea

d) Arterial Blood Pressure (BP)
- Assessing BP
  - Drug administration
  - General rules for administering medication
  - Principles of administering medication
  - Maintaining safety in drug administration
  - Calculating drug doses
  - Medication errors
  - Routes and techniques of drug administration
  - Enteral routes
  - Parenteral routes
  - Details on routes of drug administration:
    - ✓ Oral medications
    - ✓ Injectable
    - ✓ Intra- muscular routes

-Sites identification

a) buttocks

b) Thigh

c) The upper arm

- Subcutaneous route (procedure)
- The IV route

OTE126: Clinical Practice II

OTE127: Civics Education and Ethics –Research Project

Objective: At the end of this course, the student should acquire basic knowledge on civics and ethics applicable by the citizen in his daily life and at his job site and master law related in medicine.

- **Civics Educationand Ethics**
  - **Content**

1. Concepts:
- The citizen - the nation - the State,
- Public property unto collective property,

- The freedoms;
- The public service;
- Problem of ethics,
- Ethics, Law and reason;
- Management and ethics of responsibility;
- Ethics and management;
- Civics
- Deontology
- Moral consciousness
- The universal declaration of Human Rights
- Good governance in public services
- The importance of civics to the life of the nation
- Functions of the state and its citizens
- Deontology, Professional ethics and professionalism
- Relationship between morality, law and ethics
- Codes of ethics

- **Research Project**

➢ **Initiation to research: 1 credit (15hours); L, T, P, SPW**

1. In Health Research
2. Sources of Knowledge
3. Methods of Reasoning
4. Stages of the research process (rational, assumptions, literature review, methodology, results/discussion, summary, bibliography)
5. Classification of research
6. Establishment of the Questionnaires
7. Ethics
8. Preparation and Presentation of Research Reports
9. Case practice: drafting of protocols of research

- **Research Project**

Objective: At the completion of this course, students should be able to:

- Understand the role of bias and confounding and how to control for these in selection of study design.
- Appreciate the role of chance/random error, and the appropriate choice and application of statistical testing to assess this.
- Demonstrate the skills and knowledge required for independent or group research.

Construction of a Research proposal: **Background:** Literature review, formulating the problem statements, justification of studies, objectives, framing the questions according to general and specific objectives; is developing a testable hypothesis to achieve the objectives for quantitative research selection, referencing, etc.; Ethical

considerations; Work plan: personnel; timetable project administration; Plans for dissemination.

Data collection and management: Design and Pretesting of measuring instruments (reliability and validity of instruments);training of interviewers; quality control of measurements; computerization, checking and validating, measurements; the issue of missing observations, statistical summarization of information; testing of hypothesis.

Analysis & presentation of Results; Report writing and format.

OTE231: Ocular Anatomy & Physiology- Theory & Practical

Objective: The objective of this course is to provide knowledge of ocular anatomy & physiology that will help the students meet the ultimate objectives of this program.

Content:

Anatomy: Embryology –ocular, Orbit, Cornea, Lens, Zonules, Uveal Tract & its vascular supply, Vitreous, Sclera, Anterior chamber and its angle, Retina & its vascular supply, The Ocular motor system, The pupillary &ciliary muscle, The lachrymal appears, Anatomy of the Ocular Adnexa & glands

Physiology: Cornea, Uveal tissue, Lens, Aqueous humour, Vitreous Humour, Retina, Optic Nerve, Ocular Circulation, Protective Mechanism of the eye, The ocular motor system, Intraocular pressure, Pupil, Accommodation, Color vision, Geneculate cortex, Visual perception, Physiology of vision- Visual acuity, Contrast Sensitivity, Light & Dark adaptation, Binocular vision, Electrodiagnostic tests – ERG, EOG, VER

OTE232: General Pharmacology and Clinical Pharmacology

Objective: At the end of this unit, the students will know the principle of drug action and rational of use in treating diseases, drug resistance, spectrum of activity of each drugs treated, the pharmacokinetic and pharmacodynamic profiles of classes of drugs treated.

Content:

- Fundamental concepts and Terminology
- Introduction (Branches of pharmacology)
- Principles of pharmacokinetics
- Principles of pharmacodynamics
- Chemotherapeutic Agents (Antibiotics and Antineoplastics)
- Brief bacterial morphology and Antibiotic resistance
- General features of Antimicrobials
- Beta lactams
- Classes/ Drug examples, mode of action,
- Effects ofCephalosporins and penicillins
- Tetracyclines Classes/ Drug examples, mode of action,

- Effects and Precautionary measures.
- Aminoglycosides Classes/ Drug examples, mode of action,
- Effects and Precautionary measures.
- Macrolides Classes/ Drug examples, mode of action,
- Effects and Precautionary measures.
- Sulphonamides Classes/ Drug examples, mode of action,
- Effects and Precautionary measures.
- Fluoroquinolones Classes/ Drug examples, mode of action,
- Effects and Precautionary measures.
- Anti- tubercular drugs
- Drug examples,
- Mechanism of action
- Effects and Precautionary measures.
- Drugs for treating leprosy
- Antiviral Drugs
- Pathophysiology and treatment of common viral infections like;
- Viral Hepatitis, herpes zoster, HSV-1, Influenza, etc
- HIV Morphology and Essential stages in viral replication which act as drug targets.
- Anti-retroviral drugs
- Anti-Fungal Drugs - Common fungal infections.
- Anti-Fungal drugs (Polyenes, Azoles, Allylalanines, Antimetabolites, etc)
- Antiparasitic Drugs Introduction and classification of agents.
- Amoebic dysentery
- Toxoplasmosis and Pneumocystis carinii pneumonia (PCP)
- ANTDelmiNTDes: Nematode, Trematode&Cestode infections
- Malaria: Mode of action /effects of drugs used in the treatment of; blood/tissue Schizonts, hypnozoites,
- Chemical disinfectants, antiseptics and Preservatives.
- Principles of Toxicology: Definition of poison, general principles of treatment of poisoning with particular reference to oral and systemic poisoning.
- Cancer therapy the cell cycle
- Cell cycle specific agents:
- Antimetabolites: - indications mode of action
- Effects and Precautionary measures for;
- Pyrimidine, purine and folic acid Antagonists
- Mitotic Inhibitors: indications, mode of action
- Effects and Precautionary measures for;
- Plant alkaloids antibiotics and Topoisomerase inhibitors
- Cell Cycle Non-Specific Drugs (cytostatic agents)
- Revision of previous work
- Indications, mode of action

- Effects and Precautionary measures for; alkylating agents, intercalating agents
- Hormones and their Blockers.
- Pharmacokinetics and pharmacodynamics ofEstrogens, Androgens, Corticorsteroids, Progestazens, etc.
- Mechanisms of Resistance to Cytostatic agents
- Diminished cellular uptake, increased syNTDesis of P-glycoprotein,
- Diminished bio activation of a pro-drug,
- Change in site of action, Damage repair, etc.

OTE233: Visual Optics I- Theory & Practical / Lighting &The Eye- Theory & Practical

- **Visual Optics I- Theory & Practical**

Objective: The objective of this course is to provide knowledge of visual optics that will help the students meet the ultimate objectives of this program.

Content:

Review of Geometrical Optics: From Geometrical Optics. Schematic and reduced eyes and their properties.Optical constants of the eye and their measurement.Purkinje images.Corneal curvature and thickness.Keratometry and pachometry.Indices of aqueous and vitreous. Optical Defects of the Eye- Shape of Cornea, Shape & RI of the lens, Optical axis, Visual axis (angle alpha, Fixation axis (angle gamma), Aberration of the Optical system of eye, Depth of focus, Diffraction & resolving power. Emmetropia and ametropia, Axial versus sPWrical ametropia, Myopia Hypermetropia (Hyperopial) Astigmatism. Accommodation- possible mechanism of accommodation- Schiener disc experiment- theories of accommodation- modern theory- changes in the lens during accommodation- the amplitude of accommodation- the measurement of the amplitude n of accommodation- depth of field, luminance and blur tolerance- amplitude of accommodation versus age. Presbiopia-near vision addition- estimate of addition- unequal near vision addition- effect of changing the spectacle distance – hypermetropia and accommodation.

- **Lighting & The Eye- Theory & Practical**

Objective: The objective of this course is to provide knowledge of lighting & the eye that will help the students meet the ultimate objectives of this program.

Content:

Eye and Vision: Spectroradiometric curve- Vλ -λ curve- photopic and scotopic vision CIE standard observes.

Photometricquantities and units- Luminous Flux, Lumen- Illuminance, lux Luminousintensity, Candela – Luminance, Candela/m2. Inverse square law and Cosine law of illumination (Illuminance)

Photometry- LumerBrodhum photometer, Guild Flicker photometer- Photocells photo multipliers – photodiodes-noise in physical photometers. Determination lighting of Polar curve of lamps.

Calculation- Application of inverse square law and Cosine law- Matt surfaces- Lumen method of lighting design – utilization factor, light loss factor, Glare and glare index- disability glare- discomfort glare- control of glare- contrast

Light sources- Special energy distribution- luminous efficacy- color rendering properties- Flicker contracts- Daylight, its properties- color lamp – Incandescent .lamps - low pressure Hg-lamps- High pressure Hglamps- Low-pressure NA- lamp- High pressure NA-lamps- Typical applications.

Lighting Installation- Luminaries their design function up lighting – down lighting mounting position- Choice of lighting equipment- lighting system management.

Recommended level of illuminance for various including those in optometry and ophthalmology driving etc.

VDU- Design of work station – Flicker color contrast- Regulations regarding the use of VDU.

Eye Protectors- their constructions standard relating to eye protection

OTE234: Clinical Refraction I - Theory & Practical

Objective: The objective of this course is to provide knowledge of clinical refraction that will help the students meet the ultimate objectives of this program.

Content:

Ophthalmic Case Historian: Demographic data, chief complaints, secondary complaints, ocular history, medical history, drugs and medications, family ocular history, family medical history, social history, review of system, few example of history writing.

Recording Visual Acuity: Distance – Snellens and log MAR. near-points/'M'/RS, use of Baily-lovie word reading chart.

Objective Refraction: Streak Retinoscopy – all procedures to use streak retinoscope; static and dynamic retinoscopy, different methods of dynamic retinoscopy – MEM, Nott's, Sheard's, Low and high neutral, Bells, Cross, Taits. Other methods of retinoscopy-Radical, near (Mahandra), Chromoretinoscopy, String Lensbar, use of objective and autorefractor.

Subjective Refraction: Monocular Distance – Classic fogging, testing of astigmatism under fog fixed astigmatic dial (clock dial), rotary astigmatic dial, combination of fixed and rotary dial (Fan and Block test), J.C.C. Duochrome or Bichrome, Binocular balancing – alternate occlusion, prism dissociation, dissociated duochrome balance, Borish dissociated fogging, equalization

Binocular Distance – T.I.B. (Turville Infinity Balance), Polarized – Target and polarized filter, fogging.

Near subjective refraction.

Cycloplegic refraction, cycloidemia, sudden unfogging, Borish delayed sPWrical end point, pinhole estimation of refractive error, stenopaic slit refraction, measurement of vertex distance, distometer, use of subjective autorefractor.

Different methods of measuring amplitude of accommodation.

Correction of Presbyopia – Different methods of stimulation of tentative presbyopic addition – amplitude of accommodation, J.C.C., NRA-PRA balance, Bichrome, Plus Build-up, based on age,
Dynamic retinoscopy. Occupational consideration, finalization of odd for near and intermediatedifferent options of correction.
Measurement of IPD and significance.
Final discussion with the patient.
Writing prescription of power and counseling

OTE235:Ophthalmic& Optical Instrumentation & Procedure I- Theory & Practical

Objective: The objective of this course is to provide knowledge of ophthalmic & optical instrumentation & procedure that will help the students meet the ultimate objectives of this program.

Content:

Detailed study of the Principles of operation, types, optical properties, constructions, adjustments and applications of the following Instruments and Devices:

- Binoculars, telescopes and projectors.
- Simple and Compound Microscopes (with Huygens and Ramsden Eye pieces and oil immersion objectives).
- Spectrometer.
- Radiuscope
- Retinoscopes
- Standard Tests Charts.
- Autorefractometer- subjective and objective types
- Opthalmoscopes- direct and indirect types.
- Refractometers- Auto refractors, Dioptron
- Slit lamp Biomicroscope
- Keratometer
- Lensometer
- Trial case lenses-best forms.
- Trial frame design.
- Cross cylinder.

OTE236 : Clinical Practice III(Optician shop)

OTE237: French for Medical Profession/English for Medical Profession/ICT 2

- **French and English 3 credits (45 ours)**

Objective: To develop communication skills in French language and English and thus enhance nurse patient relationship as needed.

Content:

1. Grammar
2. Different parts of the human body
3. Conversation in French as specific to health care
4. Conversation in English as specific to health care
5. Translation of Medical Terms, prescriptions, technical and protocol forms, drug dispensation notices
6. Drafting of reports
7. Documentation research
8. Use of data sheets and protocols in the French and English language.
9. Health structures, premises, equipment, professional categories
   - Drafting of researchtopics
   - Dissertation on the professional articles
   - Interviews - Speech unto etc. ….
   - Health structures, premises, equipment, professional categories
   - Hospitals
   - The Hardware
   - The staff
   - The Role
   - The pathologies
   - The drugs
   - **The pathologies by systems**
   - Urinary system;
   - Cardiovascular System;
   - Digestive system;
   - The endocrine system.
   - **The dispensing of drugs**

➢ **Technique of information and communication 2**

1. Creation of a simple database with a spreadsheet (How to Give a name to a cell range)
2. Validation of Data in a range of cells on a spreadsheet
3. Creation of the statistical tables simple (modality, workforce, frequency) and automatic filling with functions such as NB, NB.If and NB.If.ENS, Average, Sum, if
4. Creation of graphics from statistical tables
5. Presentation and use of a statistical software (ex: Epi Info)
6. Creation of a questionnaire on EPI info or other
7. Data entry and analysis
8. Definition of the concepts of the computer network
9. Presentation of the types of media and networks
10. Presentation of Internet (Connection, research, download)
11. Networks withoutwires

12. Learning of a software application
13. Numbering system
14. Computer Security: Virus and antivirus

OTE241 :Physical Optics- Theory & Practical

Objective: The objective of this course is to provide knowledge of physical optics that will help the students meet the ultimate objectives of this program.

Content:

Dual nature of light- Simple harmonic motion- differential; Simple harmonic waves- mathematical representation; Super position of simple harmonic waves.
HUYGENS' Principle – laws of reflection and refraction at plane and sPWrical surfaces. Wave velocity & group velocity; determination of velocity of light (any one method.)

Interference: Coherence; path and phase difference; Theory of interference fringesintensity distribution infringes; Young's double slit experiment- Fresnels' biprism, Lloyds' error experiments; visibility of fringes.
Interference in thin films due to reflected and transmuted light- Interference in wedge Shaped films; Newton's ring experiment ; Color of thin films; Thin film antireflection wating and filters.

Diffraction: Diffraction by single slit; double slit, multiple slit- grating, circular aperture – amplitude & intensity distribution (final expressions only). Circular aperture- airy pattern, resolution by circular apertures. Diffraction grating- reflection, traasnussion , amplitude & phase gratings(definitions in brief). Grating dispersion &dispersue power, spectral resolution; zone plates.

Polarization & Crystal Optics: Concept of polarization , linear , circular , elliptical polarization (qualitatively), Plane of polarization & vibration, degree of polarization, polarizes, analyzers, Production of polarized light, birefringence, calculate crystal , veal prism, Wallaston prism , retarders - full, half & quarter wave plates, analysis of light of unknown. Polarization.Linear Scattering- Raleigh &Mce.Principles of LASERs. Holography – basic principle; simple experimental arrangement, some applications.

OTE242: Ocular Pathology and Microbiology- Theory & Practical / Geometrical Optics- Theory & Practical

- **Ocular Pathology and Microbiology- Theory & Practical**

Objective: The objective of this course is to provide knowledge of ocular pathology and microbiology that will help the students meet the ultimate objectives of this program.

Content:

Structure & function of immune system – Structure and function of thymus, spleen & red bone narrow- Immunity & its types , plasma proteins & immune

reaction, cells involved in immune system. Humoral immunity theories of antibodies formation.Structure & function of lymph nodes. Structure & function of thymus, spleen & red bone narrow. Non specific immunity, Antibody mediated immunity, specific immunity, cell modified immunity, Active immunity, Passive immunity.

The acute inflammatory reaction – changes in acute inflammation, changes in the calibre of the blood vessels, changes in blood flow, changes associated with exudation. Local sequelae of acute inflammation. The chemical mediators of acute Inflammation & Repair: inflammation. Role of the mast cell in inflammation.Role of the platelets in inflammation. Chronic inflammation – cause, classification, general features. Source of infection.Transmission of organisms to the body.Wound infections. Wound healing. Immuno-pathogenesis – type I, II, III & IV hypersensitivity. Mechanism of autoimmunity.Organ specific & non organ specific auto immune disease.The HCMA system – histocompatibility complex.Pyogenic & bacterial infection.Gralt rejection-basic outline.

Disorder of growth – metaplasia, dysplasia, neoplasia.Circulatory disturbances – thrombosis, infarction, ischemia, embolism.Degeneration (calcification).

Bacteria: Cell structure, elementary idea about classification and morphological basis. Staining reactions: Gram staining, spore staining, acid fast staining. Bacterial growth: nutritional requirements, physical factor affecting, culture media, and growth curve. Elementary idea about bactericidal agents: PWnol, alcohol.

Sterilization (principles, types & methods).Pasteurization. Antibiotics: Bacteriostatic and bactericidal effects.

Virus: elementary knowledge of viral-morphology, viral genome and classification, viral replication. Herpes viruses, hepatitis viruses, miscellaneous viruses, human immunodeficiency viruses.

Microbial growth & death, Laboratory culture, host pathogen interactions, antimicrobial chemotherapy, pathogenic mechanisms common to external ocular infections process – clinical pathology.

Physiology, pathology, treatment & epidemiology of infectious diseases caused by bacteria, virus, fungi & parasitic organisms with emphasis to disease with ocular manifestations & infectious eye diseases in hot climate as in Cameroon. AIDS & eye.

- **Geometrical Optics- Theory & Practical**

Objective: The objective of this course is to provide knowledge of geometrical optics that will help the students meet the ultimate objectives of this program.

Content:

What is light- dual nature- particle & wave nature, speed, wave length & frequency of light?

Fermats' principle- laws of relation & refraction at a plane surface using Fermats' principle.

Snells' law, relative and absolute refractive indices, total internal reflection and

Critical angle, refraction by plane parallel slab of glass; molecular basis of reflectively (basic index).

Geometrical path length & optical path length of rays, Concept of wave fronts & rays, concept of vergence /divergence, convergence.

Refraction by sPWrical surfaces- convex & concave, Derivation of vergence equation, focal points, deportee power, image point, lateral & axial magnification, simple numerical.

Thin Lens- shapes, derivation of lens makers' formula, thin lens vergece equation, equivalent focal length of two thin lenses separated by a distance & placed in contact, lateral magnification of thin lenses in contact, simple numerical, concept of reduced systems.

Thick Lens- Cardinal Points& planes, front & back vertex power, matrix theory in paraxial Optics to locate positions of cardinal planes. Different types of aberrations & their effects.

Prism- Dispersion of prism, reflecting prisms, prisms diopters.

Geometrical theory of optical fibers.Uses of optical fibers.

OTE 243: Visual Optics II- Theory & Practical

Objective: The objective of this course is to provide knowledge of visual optics that will help the students meet the ultimate objectives of this program.

Content:

Correction of ametropia

Correction of myopia- spectacle refraction (F) – ocular refraction (K) – Relationship between F and K. correction of hypermetropia- the effect of vertex distance change. Correction of ametropia with Thick lenses.Some problems involving K.

Clear and blurred images in the reduced and simplified schematic eyes.The visual axis. Pupil size and blur disc diameter. Depth of field .retinal image size in uncorrected reduced eye.Spectacle magnification in reduced and corrected eyes.Nodal points and clear image size.Retinal images with a near object.Spectacle magnification in near vision.The simple magnifier.Relative spectacle magnification.Correction of sPWrical ampetropia with contact lens.Spectacle magnification with a contact lens.

Ammetropia in the actual human eye.The growth of the human eye in emmetropia.SPWrical ametropia in adult eye.Genetic aspects of refractive error. Summary of the causative factors involved in ametropia. Progressive myopia.Juvenile stress myopia.

Aphakia.Reflective error in aphakia.The retinal image size in aphakia.Correction of aphkia by a contact lens.Use of an intracocular implant.Power of the implant and retinal image size.Clinical aspects of aphakia.

Astigmatism.Oblique astigmatism.Astigmatism in the reduced eye.The retinal images of point and extended objects.Classification of astigmatism.Correction of astigmatism by sPWro- cylindrical, toric and contact lenses.

Retinoscopy – principle and use. Clinical recording of standard of vision-visual acuity.
Review of subjective refractive methods. Problem of review of objective refractive methods Crosscylindrical method of detecting astigmatism
Eye as an imaging instrument.Schematic eyes.Diffraction and the eye.Image formation in wave optics.
Aberrations of the lens and cornea.Chromatic aberration of the eye.Optical performance of the eye.Total performance of the eye.Variation of visual performance with focus. Contrast sensivity of the eye.

OTE244 :Clinical Refraction II - Theory & Practical

Objective: The objective of this course is to provide knowledge of clinical refraction that will help the students meet the ultimate objectives of this program.

Content:

- Assessment of children Vision &Paediatric evaluation, diagnosis & management.
- Strabismus &Aniblyopia.
- Non- StrabismicBiuoculan Disorders.
- Neuro- Optometric Rehabilitation.
- Evaluation, Diagnosis & Optometric management of children with mental retardation C.P. Dyslexia, Multiple Sensory Motor Handicap.
- Visual Disorders in senior citizens, evaluation, diagnosis+ management.
- Sports vision.
- Refraction in special cases (pseudophakia, aphakia, irregular corneal astigmatism, coloboma of iris, choroids, retina, nystagmus, post R.K., PRK, LASIK)
- Congenital cataract, glaucoma.
- Patient with low vision.
- Patient with anisometropia (Anisokonia)
- Monocular & binocular subjective refraction.

OTE245: Ophthalmic & Optical Instrumentation & Procedure II- Theory & Practical

Objective: The objective of this course is to provide knowledge of ophthalmic & optical instrumentation & procedure that will help the students meet the ultimate objectives of this program.

Content:

- Principles, clinical use (methods) & significance of following instruments:
- Tonometer – Principles, types, clinical importance as a routine procedure (application)
- Pachometer – Principles, types, clinical importance

- Devices for color vision testing – CS testing / Glare testing.
- Ultrasonography – (A scan, B scan) – Principles and application.
- F.F.A – Principles and demonstration of film.
- PAM – Principles and importance.
- Perimeter – Basics of perimetry – Humphray instruments, automated perimetry – basics, types (names), interpretation of normal Glaucoma Field of Definition.
- LASER – Introduction – Einstein co-efficient, population inversion.
- Different types of LASER (mention) – Excimer, Lasik
- Nd-yag, Argon, Diode, He-Ne gas LASER, Xenon.
- LASER safety, Ophthalmic LASER application (Argon, Yag).

OTE246: Clinical Practice IV and Introduction to Operational Research

Objective: At the completion of this course, students should be able to:

- Understand the concepts of research in the biomedical sciences and be able to apply them
- Be able to accurately describe the fundamental concepts and approaches in qualitative and quantitative research methodology.
- Be able to find and appraise the available research literature through the use of valid resources, and thereby provide informed opinion.
- Be able to raise research questions in professional practice and apply appropriate research methodology to investigate and solve the research questions.
- Write a research proposal for approval by the Ethics Committee.
- Understand the role of bias and confounding and how to control for these in selection of study design.
- Appreciate the role of chance/random error, and the appropriate choice and application of statistical testing to assess this.
- Demonstrate the skills and knowledge required for independent or group research.

Content:

Introduction to research: Meaning and objectives of research; definition and Significance of health research, importance of research methodology for health science students.

Scientific research: Definition; C**haracteristic of scientific research:** Purposiveness, Rigor, testability, reliability, validity, replicability, precision, generalizability, objectivity); **Dimensions of scientific research** (concepts, theories, deductive & inductive reasoning, empiricism, variables, hypothesis, propositions **Elements of the Scientific Method**: Empirical Approach, Observation, Question, Hypotheses, Experiments, Analysis, Conclusion, and Replication

Scientific research process:

Categories of Research: Empirical and theoretical research, Basic and applied, Descriptive vs Analytical Research, Quantitative vs Qualitative Research, Conceptual vs Empirical Research, Etc.

OTE247: Biostatistics I - Health Information Systems

- **Biostatistics I**

Objective: To summarize, analyze, present and interpret health statistical information.

Content:

- **Mathematics**

1. Percentages, rates, proportions, simple and compound interest, discount
2. The electronic calculator

Basic Algebra

1. Algebraic expressions
2. Functions
3. Linear and Simultaneous Equations
4. Graphs of Functions
5. Quadratic Equations
6. Arithmetic and Geometric progressions

- **Biostatistics**

1. Introduction
2. Basic concepts in biostatistics
3. Sampling techniques and data collection
4. Variables (Qualitative and Quantitative)
5. Presentation of data: Frequency and frequency distribution, bar charts, Histograms, pie charts etc.
6. Summarization of qualitative and quantitative data: mean, median, standard deviations and standard errors.

- **Health Information System**

Objective: After going through the course, the students should be able to:

- Define the main Concepts and Terminologies used in Health Management Information Systems.
- Describe the various components of a health information system
- Know the different sources and type of data for a health Information system.
- Undertake Health Data Management to provide health information capable of guiding the planners and stakeholders in health care delivery system.
- Understand the foundational basis for the National Health Management Information System Policy
- Describe Project cycle, Monitoring tools and Evaluation of health projects and programs.

Content:

Introduction: Definition of Concepts and Terminologies-data, information, management, health, system, health system, health information, health information system.

Determinants of health: Socio-economic Situations, Demographic Situation, Epidemiological Situation, Health Resources, Human Capital, Health Services, Sectoral Situations: Education, Agriculture, Mineral Resources, Water Resources, Transport, etc.

Components of health information systems: Health information resources, Health Indicators, data management, information product, Disease surveillance, monitoring, evaluation.

Health Data Management (Data **management cycle (Data collection, Analyses, Reporting, Dissemination, Data use**): Characteristics of good Data , Types and Sources of Health Data, Methods of Data Collection & some Standard Forms for Health information , Challenges of Health Data Collection, Basics of Data Processing and Analysis (computer –based & paper-based).

National Health Management Information Systems: Challenges and strategies

Monitoring and Evaluation: Programme cycle; Characteristics of Health programme monitoring system (Data collection, Analyses, Reporting, Dissemination. Data use)

OTE351: Ocular Disease I (Anterior Segment Disease)

Objective: The objective of this course is to provide knowledge of ocular disease that will help the students meet the ultimate objectives of this program.

Content:

Anterior segment ocular diseases involving orbit, eyelids, adnexa, conjunctiva, cornea, urea, sclera, anterior chamber, iris and lens. Symptomatology, clinical signs, diagnosis, pathogenesis, pathophysiology, systemic disease relationships and treatment of degenerative, infections and inflammatory conditions affecting these structures.

Disease of the Lids – Congenital Deformities of the Lids .Oedema of the Lids.Inflammatory Conditions of the Lids.Deformities of the Lid Margins.Deranged Movement of the Eyelids. Neoplasm's of the Lids. Injuries of the Lids.

Diseases of the Lachrymal Apparatus-. Dry Eye. Disease of the Lachrymal Gland.Disease of the Lachrymal Passages.Operations for Chronic Dacryocystitis.

Disease of the Conjunctiva- SubconjunctivaLaemorrhage Infective Conjunctivitis.Follicular Conjunctivitis.Granulomatous Conjunctivitis.Allergic Conjunctivitis. Conjunctivitis Associated with Skin conditions. Degenerative conditions of the Conjunctiva. Vitamin- A Deficiency. Cysts and Tumours of the Conjunctiva.ConjunctivalPigmentation.Injuries of the Conjunctiva.

Disease of the Cornea –Congenital Anomalies.Inflammation of the Cornea (Keratitis).Superficial Keratitis.Deep Keratitis.Vascularisation of Cornea.Opacities of the Cornea.Keratoplasty.Corneal Degenerations.Corneal Dystrophy's.Corneal

Pigmentation.Corneal Injuries.Refractive Corneal Surgery. Corneal Ulcer (Bacterial,Viral,Fungal)
Disease of the Sclera- Episcleritis.Scleritis.Staphyloma of the Sclera. Blue Sclerotic Scleromalacia Performs. Nanophthalmos.Injuries of the Sclera.
Disease of the Iris.-. Congenital Anomalies.Inflammations (Anterior Uveitis).Specific Types of Iriodocyclitis.Degenerations of the Iris.Cysts and Tumours of the Iris.Injuries of the Iris.
Disease of the Celery Body- Inflammations of the Celery Body.Purulent Iriodocyclitis (Panophthalmitis).Evisceration.Sympathetic Opthalmia.Vogt- Koyanagi – Harada Syndrome.Tumours of the Celery body.Injuries of the Celery body.
Glaucoma- .Formation of Aqueous Humor.Drainage of Aqueous.Intraocular Pressure (IOP).Ocular Rigidity.
Tonography..Developmental Glaucoma (Buphthalmos).Primary Narrow Angle Glaucoma. Primary
Open Angle Glaucoma. Normotensive Glaucoma.Ocular Hypertension.Secondary Glaucoma.
Surgical Procedures for Glaucoma (Steps Only), YOGPI, trabeculectomy.Laser Procedure in Glaucoma.
Artificial Drainage Devices in Glaucoma Surgery (Molteno).
Disease of the Lens- Congenital Malformations.Cataract.Congenital and Developmental Cataract.Senile Cataract.Traumatic Cataract.Complicated Cataract.Secondary Cataract.After Cataract.Dislocation of the Lens. SurgicalProcedures for Removal of the Lens (Operative Steps Only). Phacoemulsification (ICCE, ECCE, IOL).Small Incision Cataract Surgery (Manual Phaco).Intraocular Lens Implantation-AC+PC, IOL.

OTE 352 :Binocular Vision & Ocular Mortality, Health Care Management

- **Binocular Vision & Ocular Mortality**

Objective: The objective of this course is to provide knowledge of binocular vision & ocular motality that will help the students meet the ultimate objectives of this program.

Content:

Grades of binocular vision-simultaneous perception (first grade of binocular vision), fusion, and steropsis (third grade of binocular single vision). Advantages of binocular vision.Visual direction and the horopter_visual direction, corresponding point and normal retinal correspondence, horopter, physiologic diplopia. Binocular fusion-panum'sarea,fixationdisparity,theories of binocular fusion,synergy hypothesis of panum,local sign hypothesis of hering,eye movement hypothesis of helmholts,suppession hypothesis of du tour and verhoeff,physiologic basis of fusion.
Dihoptic stimulation-depth with fusion and depth with diplopia, diplopia without depth, retinalrivary and suppretion, binocularlusure.Stropsis-physiologicalbasis of stereopsis, local and global stereopsis and fusion, stereopsis acuity neurophysiology of stereopsis.

Depth perception-steropsis,nonstereoscopiccluestoyhe perception of depth under binocular condition,monocular clues (non stereoscopic clues to spetial orientation)-parallactic movements, linear perspectiveoveriay of contours,sizedistance from horizon ,distribution of higHCMights, shadow, shades and light .aerial perspective,influence of accommodation and convergence on depth perception, conclusion. Integration of the motor and sensory system into binocular vision.
Binocular defects: Binocular optical defects-anisometropia-vision in anisometropia, treatment, Binocular optical defects-aniseikoniasymtoms, clinical investigatoin, treatment. Binocular muscular co-ordination-orthophoria-binocular vision.
Binocular muscular anomalies-heterophoria-the causes of imbalance, exophoria, esophoria, hyperphoria, cyclophoria, symptoms of heterophoria, treatment.Binocular muscular anomalis-heterotropia—the vision in concomitant strabismus, treatment. Binocular muscular co-ordination-convergence-voluntary and reflex convergence, reflex convergence, the measurement of convergence, the relation between accommodation and convergence, binocular accommodation, fatigue of convergence. Binocular muscular anomalies-anomalies of convergence and other reading difficulties—insufficiency of convergence, convergence excess, the ophthalmologist and the reading ability of children.

Binocular Vision Test:
Test for simultaneous macular perception, test for fusion, test for stereopsis-synoptophore or stereoscope test, vectograph test, titmus stereo test,randomdotsterogramtest,simple motor task test based on stereopsis.

Eye movements: the orbit anatomy of the extraocular muscles. Interactive dynamics of orbital mechanisms & brain stem neurophysiology – out line of extra ocular muscle control. Extra ocular muscles-their function & nerve supply. Mechanics of actions of extra ocular muscles -cross sectional area of muscle, length of muscle.Arc of contact, muscle plane, Muscle axis of rotation.
Physiology of ocular movement – Basic Kinematics, (position of gaze, Fick's axes)
Ocular movements - Monocular Movements (Adduction, Abduction, supraduction, Infraduction, Incycloduction, excycloduction). Binocular Movements –VERSIONS-(saccadic & pursuit movement, position maintenance movements, stabilization movements & their characteristics). VERGENCES – (Convergence, divergence, vertical vengeance), Supra nuclear control of eye movements.(the superior colliculi, the occipital cortex, the psycho optical reflexes & fixation.

Oculomotor system: vestibular – ocular reflexes, optokinetic reflexes. Diagnosis & clinical aspects of ocular anomalies & disorders.
Converge through a spectacle lens. Prismatic effects in spectacle lenses.

The Cameroon Health organization
Missions of health units in the National territory: Health centers, district hospitals, Central hospitals, University teaching hospitals, private, lay, and denominational hospitals and clinics,

Relationship with health, national and international poverty-control organizations (other ministries, donors, international organizations, NGOs, associations),
Economic and financial management.Management of personnel, staff planning, and in service training, Management of nursing care and drugs.

- Legislation applying to health units
- Economic and financial management
- Management of personnel, staff planning, and in service training,
- Management of nursing care and drugs.
- Characteristics of an administrative document, Administrative letter writing.
- Report writing, Forwarding slip and Forwarding letter
- Public and private administrative letters and The memorandum
- Administrative note, various administrative forms, the pay voucher.
- Status of the staff of the Ministry of Public Health and Higher education
- Trade unions and Associations: the right to strike.

OTE353: Contact Lens I - Theory & Practical

Objective: The objective of this course is to provide knowledge of contact lens that will help the students meet the ultimate objectives of this program.

Content:

- Contact lens history & development. Benefits of contact lens over spectacle. Manufacturing methods-spin cast, Lethe cut, Cast modeling.
- Slit lamp Examination technique
- Corncal topography- Keratometry& Extended Keratometry
- Contact lensoptics-Contact lens& spectacle lens. Back vertex calculation. Contact lens & Tear lens system.
- Classification of contact lens & its material (soft&RGP); Material property.
- Contact lens terminology. RGP & soft lens design. FDA classification of contact lens material.
- Patient selection & prescreening. Indications & contra indications of contact lens.
- Soft sPWrical contact lens fitting &Assesment.
- Soft contact lens case & maintenance.
- SPWrical RGP contact lens fitting & assessment.
- RGP contact lens care & maintenance.

OTE354: Ophthalmic Lens & Dispensing Optics- Theory & Practical

Objective: The objective of this course is to provide knowledge of ophthalmic lens & dispensing optics that will help the students meet the ultimate objectives of this program.

Content:

Ophthalmic lens:

Characteristics of lenses: Introduction. SPWrical lenses. Plano-cylindricallenses.SPWro-cylindricallenses.Designation of lens power.Power of

lenses.Transposition. Write the prescription. Base curve of sPWrical lens.Base curve of cylindrical single vision lens.Aberration of lens.Prism prescription.Prism effects in a lens.Neutralization.

Spectacle lenses: Characteristics of lens materials. Specific gravity (weight).Refractive index.Abbe number.Impact resistance. Scratch resistance. Curve variation factor.

Current materials: Crownglass. CR-39. High –index glass. High –index plastic. Poly carbonate.Photo chromatic materials.

Lens types: Single vision lens. Bi-focal lenses. Tri-focal lenses. Vocational & occupational multifocal progressive lenses.

Introduction of bi-focal lenses: History of bi-focal lenses. Modern bi-focal designs.Types of bi-focal designs.Glass tri-focal lenses.Invisible multi-focal Double segment lens.Plastic bi-focals.

Opthalmic lens coating: Anti-reflecting coatings. Special notes concerning anti-reflecting coatings.Protective coating, color coating.

Absorptive lenses: Classification of lens tints. Chemical that produces color & assist in absorptive characteristics of glass lenses. Effect in prescription on lens color.Availability of tinted lenses.

Impact resistant lenses: Types of impact resistant lenses. Plastic lenses. Impact resistant Dress-Eye wear lenses. Tempered glass lenses.Types of impact resistant lenses most beneficial of specific patients.

Lens for special uses: Fresnel lenses. Thinlite lenses. Lenses for the Aphakic patient. AsPWric lenses.

Lens surfacing & quality. Principles of lens surface generation. Glass assessment.Faults in lens materials & lens surface.Inspection of lens quality.

Basics of dispensing:

Spectacle frame

Current frame materials: Plastics, Metals

Frame types: Combination of frames, Half-eye frames, Mounts, Nylon-cord frame, Special purpose frames.

Frame measurements: The boxing system, the datum system, Comparison of the two systems, Lens position, and Segment specification

Frame Selection: Fashion, Function, Feel, Conflicting needs, Price, Standard alignment

Lens Selection: Ground rule for selection, Selection criteria

Facial Measurement: The PD, Visual axes, Measuring inter papillary distance, Using PD ruler, Common difficulties in measuring PDs, Measuring monocular PD, Measuring near PD

Measuring heights: Single vision, Multi focal, Bi-focal, Progressive

Pediatric Dispensing: The changing image of spectacle, Age differences, Frame Selection, Technical Criteria, Fashion criteria, some tips on selection, Lens Selection, Technical criteria, communicating with kids, the kids' corner, Facial measurement of the kids, PDs, Centers, Bi-focals

Dealing with problems: Dealing with clients, Common client problems, dealing with professional colleagues, dealing with the laboratories

Special needs dispensing: Occupational dispensing, Hazards in the work place, Occupational health safety legislation, Common hazards.

Eye protection: Industrial eye protection, Sport, Standards covering eye protection, Lens materials & impact resistance, Frame & eye protection.

OTE355: Low Vision Aids & Visual Rehabilitation- Theory & Practical

Objective: The objective of this course is to provide knowledge of low vision aids & visual rehabilitation that will help the students meet the ultimate objectives of this program.

Content:

- Definition-old, new, proposed
- Grades of low vision
- Statistics/ Epidemiology
- Relation between disorder, impairment & handicapped
- Low vision optics
- Magnification-relative distance/ relative size/ approach/angular Optics of Galilian&Keplarian telescope- advantage/disadvantage, significance of exit & entrance pupil.
- Optics of spectacle magnifier/ determination/ calculation/ disadvantage/advantage.
- Optics of stand magnifier, significance of equivalent viewing distance & calculations.
- Telescope- distance/ near/ telemicroscope/ monocular/ binocular/ bioptic.
- Determination of decentration of lenses /prism/calculation/Lebenson's formula/simple diotric formula.
- Hand held magnifier-illuminated/ non-illuminated.
- Spectacle magnifier / half eye/ prism correction/ bar magnifier/ CCTV/ magni-cam/ low vision imaging system or V-max / contact lens & IOL telescope.
- Low vision examination: Task/ Goal oriented history-medical/ visual/ psychological history/ task analysis/ mobility/ distance vision/ near vision / daily living/ illumination/ work &school. Visual acuity measurement-distance/ near/ use of log MAR chart (distance& near)/ light house, picture chart/ visual field/ Amsler chart/ contrast sensitivity/ overview of glare testing. Low vision refraction.
- Assessment & prescription of low vision devices-optical/ non-optical/ rehabilitation services. Non- optical devices-pen/umbrella/ boldline note book/ illumination/ letter writer/ environmental modification/ signature guide/ needle threader/ eccentric viewing strategies.
- Overview of Rehabilitation Services:- definition/ implementation/ vocational guidance/ educational guidance/ mobility & orientation training / special

teacher/ special school/ Braille system/ integrated system/referral center-activity/ support/ loan.

- Overview of systematic / retinal diseases in relation to low vision:- acromatopsia/ LMBB, syndrome/ labers congenital anomaly/ down syndrome/ retinitis pigmentosa/ diabetic retinopathy/ optic atrophy/ albinism/ aniridia.
- Counseling of low vision patient/ parents/ guardians/relatives.

OTE356: Clinical Internship V(Optical department)

OTE357: Medical Law and Biostatistics II

- **Medical Law**

Objective: To know the components of medical law.

Content:

- Chapter one: criminal law
- Chapter two: criminal responsibility
- Chapter three: labour law
- Chapter four: some rights of the employee under the labour rule
- Chapter five: civil status registration
- Chapter six: right of women and children under the code
- Chapter seven: tort
- Chapter eight: inheritance, succession and wills
- Chapter night: introduction to human right
- Chapter ten: some international right instruments

Biostatistics II

Content

1. The concept and Principles of Significant tests and confidence intervals
2. Statistical testing and inference: The normal distribution and t-distribution, Chi squared test, Poison distribution, non-parametric tests etc.
3. Errors in statistics

OTE361: Ocular Disease II (Posterior &Neuro-Eye Disease)

Objective: The objective of this course is to provide knowledge of ocular diseases that will help the students meet the ultimate objectives of this program.

Content:

Diseases of the Vitreous Humor- Congenital Anomalies.Vitreous Opacities. Hereditary Vitreo – Retinal Degeneration's. Vitreous Haemorrhage .Detachment of Vitreous Humor.Vitreous Surgery.

Methods of clinically assessing the posterior segment (direct & indirect opthalmoscopy)

Disease of the Retina- Congenital & Dev. Defects.Inflammation of the Retina (Retinitis).Retinal Vasculitis .Oedema of the Retina.Haemorrhage of the Retina.Vascular Occlusion.Retinal Arteriosclerosis.Retinopathies.Retinal

Telangiectasis. Degeneration's of the Retina. Detachment of the Retina.Surgical Procedures for Retinal Detachment .Tumours of the Retina. Phakomatoses, Injuries of the Retina.

Disease of the Optic Nerve- Congenital Anomalies.Papilloedema.Inflammation of the Optic Nerve (Optic-Neuritis).Ischaemic Optic Neuropathy.Optic Atrophy.Tumours of the Optic Nerve.Injuries of the Optic Nerve.

Symptomatic Disturbances of Visual Function – Visual Field Defects.Amblyopia.Amaurosis.Night Blindness.Day Blindness.Defects in Color Vision.Congenital Word Blindness.Malingering.

Neuro –eye disease: Evaluation of optic nerve disease. Clinical features of optic nerve dysfunction. Optic disc changes.Optic atrophy.Special investigation.Classification of optic neuritis.Optic neuritis and demyelination. Systemic features of multiple sclerosis, Special investigation. Optic neuritis.Other causes of optic neuritis; Parainfectious optic neuritis.Infectious optic neuritis.Non-arteritic anterior ischaemic optic neuropathy.Arteritic anterior ischaemic optic neuropathy. Clinical features of giant cell arteritis. Special investigation.Arteritic anterior ischaemic optic neuropathy.Leber hereditary optic neuropathy; hereditary optic atrophies; Kjer syndrome.Behr syndrome. Wolfram syndrome; Alcohol-tobacco amblyopia; Drug-induced optic neuropathies; PAPILLOEDEMA: Raised intracranial pressure - Causes. Hydrocephalus. Systemic features. Clinical features of papilloedema. Differential diagnosis. CONGENITAL OPTIC NERVE ANOMALIES: Without neurological associations, with neurological associations, Optic disc coloboma. PUPILLARY REACTION: Applied anatomy. Abnormal pupillary reactions; NYSTAGMUS: Classifications and Causes; SUPRANUCLEAR DISORDER OF EYE MOVEMENTS: Conjugate eye movements, Supranuclear gaze palsies; III, IV and VI THIRD NERVE DISEASE: Applied anatomy and Clinical; DISORDERS OF CHIASM, DISORDERS OF RETROCHIASMAL PATHWAYS AND CORTEX, OCULAR MYOPATHIES AND RELATED DISORDERS, NEUROFIBROMATOSIS

OTE362: Health Economics, Systemic Condition &The Eye

- **Health Economics**

Objective:

- This course is an introduction to Health Economics.
- It is meant to give Health science students basic principles regarding economics and its application to the health sector.
- This course focuses on issues relating to scarcity in the allocation of health resources
- It exposes students to basic theoretical and conceptual frameworks from economics that enable them to analyze the functioning of a health system critically.
- Importantly, they will learn how to apply economic theories of demand, supply, and markets.

Content

Unit 1. Introduction to Health Economics:

Definition of basic concepts: Health, Healthcare, Economics, Efficiency, Scarcity, Health Economics, opportunity cost, etc

Unit 2. Basic concepts of supply and demand analysis:

Definition of Demand and supply, Demand curve, supply curve, Market Equilibrium Elasticity of demand & supply.

Unit 3Health care market:

General features of the health Care: Perspectives of Health, Distinctive characteristics of the health Care services, Equity and health care, Demand for health care, Supply of health care, Health and Economic Development

Unit 4. Cost Concepts & Economic Evaluation:

Definition of Cost, Types of costs, Types of Economic Evaluation

Unit 5. Health Care Financing & Resource Allocation:

Definition of the health sector Financing, Factors influencing health care Financing, Sources of National Health care financing systems. Barriers to access of heath care.

Unit 6 Resource allocation:

Definition, Reasons for resource allocation in health care, Rationing in health care: Ethics and levels of rationing - Ethical theories: *Utilitarian*, *Deontological*, *Rawlsian*, Implicit and explicit rationing, Efficiency& Equity in resource allocation, Levels of resource allocation:

Unit 7 Macro- allocation (global, National, Allocating resources to healthcare versus other social needs. Allocating resources within the healthcare sector,

Micro: Allocating resources among individual patients.

Factors Complicate Ethical Resource Allocation Decisions

Unit 8 The Role Of Government In Health: Problems of health policy & possible strategies.

- Approaches to allocation: Need based analysis, economic evaluation analysis,
- Other countries' approaches: Oregon Health Plan
- New Zealand, UK,

- **Systemic Condition & the Eye**

Objective: The objective of this course is to provide knowledge of systemic condition & the eye that will help the students meet the ultimate objectives of this program.

Content:

Arterial Hypertension and the eye.Diabetes mellitus and the eye.Heart disease & the eye.Neoplasia and the eye.Eye and connective tissue disease.Diagnosis, complications, clinical features, Thyroid disease involving eye.Tuberculosis involving the eye. Tropical Disease and the Eye: Leprosy, Syphilis, Malaria; Vitamin deficiency and the eye; Neurological disease and the eye: Classification of neurological

diseases. Demyelinating diseases, Visual pathway lesions, Papiloedema.Genetic disorders and the eye.Phacomatoses& the eye.

OTE363: Contact Lens II- Theory & Practical

Objective: The objective of this course is to provide knowledge of contact lens that will help the students meet the ultimate objectives of this program.

Content:

- Contact lens fitting in astigmatism.
- Contact lens fitting in keratokoOTE.
- Contact lens fitting in children.
- RGP lenses – low D.K. and high D.K. lenses.
- Instructions regarding handling and care of lenses.
- Cosmetic and prosthetic contact lenses.
- Extended wear lenses versus Daily wear
- Disposable lenses
- Contact lens – Toric, Bifocal, Multifocal.
- Therapeutic lenses / Bandage lenses.
- Contact lens solutions – principle of action, compositions
- Ordering contact lenses – writing prescription to the lab.
- Contact lens – modifications of finished lenses (RGP).
- Checking the parameters.
- Recent advances in contact lenses.
- Follow up examinations
- Contact lens complications and their management.
- Prosthetic eye fitting procedures & conformers.

OTE364: Public Health & Community Optometry

Objective: The objective of this course is to provide knowledge of public health & community optometry that will help the students meet the ultimate objectives of this program.

Content:

- Concept of public health.
- Principles of primary, secondary and tertiary care.
- Planning of health services.
- Health economics
- Health manpower development-Basic O.T Practices, Familiarity with use of Operating Microscope
- NPCB and refractive blindness – optometrist's role as primary health care provides.
- Health cares insurance including role of PHA.
- Ocular emergencies – Foreign body, Eye Pain, Watering, Injuries-perforating, non perforating& chemical.

OTE365:Applied Optometry &Orthoptics- Theory & Practical

Objective: The objective of this course is to provide knowledge of applied optometry &orthoptics that will help the students meet the ultimate objectives of this program.

Content:

- Demonstration of following Orthoptic instruments/methods and their uses – Prism Bar, Synoptophore, Maddox Wing, Maddox Rod, Red Green Goggles, RAF Gauge, Cover test, Hirschberg test, Krimsky test, Diplopia charting, Visuoscopy, Accommodative flipper
- Orthoptic Investigative & Therapeutic Procedure.
- Case records.
- Case Handling

OTE366: Clinical Internship VI / Operational Research II

- **Operational Research II**

Content:

Research strategies and design: **Descriptive study designs**: types of descriptive studies (case report, case series & cross sectional, ecological) and their application, strengths and limitations;

Case seriesExperimental versus observational strategies; **Analytical Observational studies** (cross sectional, cohort and case studies); **Analytical interventional studies** (Experiments and Quassi experiments: clinical trials

Data collection methods & Techniques/Tools: Types of data in health research, sources of data, qualitative & quantitative methods: interviews (structured, semi-structured, unstructured); Focus groups, surveys, etc. **Questionnaire Design;** Definition, types of questionnaires, format, Language and wording style, Sequencing of questions, coding response to questions, length of questionnaire, general lay out;etc.

OTE367: Professional Ethics &Deontology

Objective: At the end of the course, the student should be able to know those values and obligations which practice in the profession.

Content: Nurse, Patient, nurse/patient relationship, obligations of the nurse, rights of the patient, rights and responsibilities of the nurse, deontology, ethics, etiquettes, patient reception in hospital, nurse/patient-relative relationship. Medical jurisprudence, lab practice and the law, forensic nursing, malpractice,malpractice, civic duties, organization of Government, Common law, labour law, Criminal Law,etc.

Content:

Ethics for laboratory students

1. Morality and Ethics: Norms, Deviances, Religion, Values, Beliefs, Cultures
2. Bioethics

3. MLS Ethics
4. Moral Development
5. Ethical Principles: Autonomy, Freedom, Privacy, Confidentiality, Beneficence, Fidelity, Motivation, Justice, Veracity and Responsibility.
6. Code of Ethics health workers.
7. Application of Ethics to MLS Practice: Respect For Life And Death, The Concept Of Dignity, Euthanasia, Human Rights, Rights of The Child, Rights of The Elderly, Patients Rights
8. Ethical Decision Making Frameworks and their Application in diagnosis
9. Context And Conflicts With Bioethical Standards
    - **Health** Employee/employer contract law for health practitioners
    - MLS and the law

C Introduction to Law and Fundamental Rights

Law

- Sources of law
- Law and enabling Acts (text of application)
- The concept of legal personality
- Civil responsibility (contract, TORT)
- Criminal responsibility
- The court and their jurisdictions
- Labor law: formation and execution of labor contract, remuneration, condition of work, obligation of the employer and employee, termination of labor contracts

Fundamental Rights

- The concepts of human rights
- Sources of human right
- Major international conventions of human rights
- International conventions relating to women
- Children and the rights of the minorities
- The role of the judiciary and the legislative in the protection of human rights
- The Cameroon national commission of human rights and liberties
- The civil society NGO's and the protection of human rights

Law for Medical laboratory personnel

- Definition of Law, public law, private law
- The client's and MLS personnel's' constitutional right

Administrative law related to licensing and regulation of health practice

Field : MEDICAL AND BIOMEDICAL SCIENCES

Specialty :

PROSTHETICS AND ORTHOTICS

Field: MEDICAL AND BIOMEDICAL SCIENCES

Specialty: Prosthetics and Orthotics

1. The objective of training

The mission of this program is to train qualified prosthetics and orthotics technicians capable of providing holistic high quality prosthetics and orthotics services in diverse clinical and academic settings locally, nationally and internationally. Our aim therefore, is geared towards training young men and women who have the vocation embedded in them and are ready to earn a living and also to save lives.

2. Research Skills

→ **Generic skills**

- Be responsible and reflective;
- Have gestural skills and interpersonal skills;
- Be able to communicate easily both in writing and orally;
- Recognize your emotions and use them with the necessary professional skills;
- Master the computer tool and ICT;
- Have proven trust and confidence;
- Have critical ability and questioning;
- Develop an ethical and a professional normal;
- make thoughtful decisions;
- Act with autonomy and responsibility in the well-defined fields of its function.

→ **Specific skills**

The student should be able to:

- Fabricate and make custom fitting of artificial limbs and orthopedic braces;
- Handle patient Assessment, formulation of the orthotic/prosthetic treatment plan, implementation of the treatment plan, and perform the necessary procedures to deliver the appropriate orthotic/prosthetic services including fabrication;
- Follow-up treatment plans, provide continuing patient care and periodic evaluation to assure/maintain/document optimal fitness and function of the orthosis/prosthesis;
- Master the health policy and evolution as well as the issues of the sectoral health strategy in Cameroon and health legislation;
- Draw instruments and their uses.

3. Outlets

- Rehabilitations centers,
- Clinics/hospitals

- Public function;
- Hospitals and private clinics;
- NGO (Non Governmental Organizations);
- Self-employment;
- Occupational Medicine

4. Organization of the Teachings

Semester 1

Field : Medical and Biomedical Sciences		**Specialty: Prosthetics and Orthotics**					
CODE	**Courses Titles**	**Hourly Volume**					**Number Of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
PRO 111	Anatomy-Physiology I /Cell Biology – Histology	45	20	5	5	60	4
PRO 112	Microbiology I : Bacteriology-Parasitology /General Chemistry & Biochemistry	35	15	5	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
PRO 113	Fundamentals of Nursing I : Overview-Concepts-History-Theories	35	15	5	5	60	4
PRO 114	Social Sciences I : Medical Sociology, Anthropology & Psychology	45	20	5	5	75	5
PRO 115	Fundamentals Of Nursing II: Human Development Across The Life Span	30	5	5	5	45	3
PRO 116	Clinical Placement I(immersion)	/	/	70	20	90	6
Transversalscourses 10% (1 UC) 3 credits 45 hours							
PRO 117	- Bilingual training - ICT I	25	5	10	5	45	3
Total		285	75	12	78	**450**	**30**

Semester 2

Field : MEDICAL AND BIOMEDICAL SCIENCES		Specialty: Prosthetics and Orthotics					
Code	Courses titles	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
PRO 121	Anatomy-Physiology II	45	20	5	5	75	5
PRO 122	Microbiology II: Virology-Mycology-Immunology	35	15	5	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
PRO 123	Fundamentals Of Nursing III: Nursing Sciences and First Aid	45	20	5	5	75	5
PRO 124	Public Health: Epidemiology-Demography-Environmental Sanitation & Health Promotion	30	5	5	5	45	3
PRO 125	Medical Nursing I	35	10	10	5	60	4
PRO 126	Clinical Placement II(immersion)	/	/	70	20	90	6
Transversalscourses 10% (1 UC) 3 credits 45 hours							
PRO 127	- French and English for Medical Profession II - ICT II	30	6		9	45	3
Total		**235**	**56**	**94**	**65**	**450**	**30**

Semester 3

Field : Medical and Biomedical Sciences		Specialty: Prosthetics and Orthotics					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
PRO 231	Material And Workshop Technology	45	20	5	5	75	5
PRO 232	Applied Mechanics & Strength of Materials	35	15	5	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
PRO 233	Engineering Drawing	25	10	5	5	45	3
PRO 234	Biomechanics – I	25	10	5	5	45	3
PRO 235	Prosthetics Science- I, Orthotics Science – I	55	10	20	5	90	6
PRO 236	Clinical Placement III(rehabititations centers)	/	/	70	20	90	6
Transversalscourses 10% (1 UC) 3 credits 45 hours							
PRO 237	Professional Ethics and Deontology	30	5	5	5	45	3
Total		**230**	**65**	**93**	**62**	**450**	**30**

Semester 4

Field : Medical and Biomedical Sciences		Specialty: Prosthetics and Orthotics					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
PRO 241	Fundamentals Of Electricity & Electronics	35	15	5	5	60	4
PRO 242	Physical Medicine & Rehabilitation, Orthopaedics & Amputation Surgery	45	20	5	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
PRO 243	Biomechanics - II	45	20	5	5	75	5
PRO 244	Prosthetics Science- II	35	15	5	5	60	4
PRO 245	Orthotics Science – II	25	10	5	5	45	3
PRO 246	- Clinical PlacementIV(rehabilitations centers) - Introduction to Operational Research	/	/	70	20	90	6
Transversalscourses 10% (1 UC) 3 credits 45 hours							
PRO 247	- Biostatistics I - Health Information Systems	25	10	5	5	45	3
Total		**227**	**70**	**100**	**53**	**450**	**30**

Semester 5

Field : MEDICAL AND BIOMEDICAL SCIENCES		Specialty: Prosthetics and Orthotics					
CODE	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses30% (2 UC) 9 credits 135 hours							
PRO 351	P & O Workshop Management	35	15	5	5	60	4
PRO 352	Mobility & Rehabilitation Aids, Health Care Management	50	15	5	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
PRO 353	Biomechanics – III	35	15	5	5	60	4
PRO 354	Prosthetics Science- III	35	15	5	5	60	4
PRO 355	Orthotics Science – III	35	15	5	5	60	4
PRO 356	Clinical Placement V (rehabilitation center)	/	/	70	20	90	6
Transversalscourses 10% (1 UC) 3 credits 45 hours							
PRO 357	Medical Law, Legal and Occupational Health and Biostatistics II	30	5	5	5	45	3
Total		**190**	**37**	**180**	**43**	**450**	**30**

Semester 6

Field : Medical and Biomedical Sciences		Specialty: Prosthetics and Orthotics					
CODE	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
PRO 361	Prosthetics Clinical Practice, Orthotics Clinical Practice,	10	15	60	5	90	6
PRO 362	Health Economics	30	5	5	5	45	3
Professional courses 60% (4 UC) 18 credits 270 hours							
PRO 363	Computer in Prosthetics and Orthotics	35	15	5	5	60	4
PRO 364	Prosthetics Science- IV	35	16	4	5	60	4
PRO 365	Orthotics Science – IV	35	16	4	5	60	4
PRO 366	Clinical Placement VI(determined by the title of project)	/	/	70	20	90	6
Transversalscourses 10% (1 UC) 3 credits 45 hours							
PRO 367	Ethics & Civic Education Research Project	25	10	5	5	45	3
Total		**196**	**49**	**153**	**52**	**450**	**30**

5. Courses content

PRO111: Anatomy and Physiology I -Cell Biology - Histology

- **Anatomy Physiology -1: 3 credits (45 hours); L, T, P, SPW**

1. Nervous System

- The organization of the nervous system: central nervous system, periPWral nervous system, autonomic nervous system (the systems parasympathetic and sympathetic);
- The structure of the nervous tissue;
- The nerve endings; - the operation of neurons; - the reflexes.

2. The Endocrine System

- The hormones;
- Thyroid and parathyroid glands;
- The pituitary and hypothalamus; - the adrenal glands; - the pancreas.

3. Organ of meaning

- The eye: the view;
- The ear: hearing and balance;
- The sense of smell;
- The taste;
- The touch.

PRO112: Microbiology I: Bacteriology-Parasitology / General Chemistry & Biochemistry

- **Bacteriology-Parasitology**

Objective: This course is designed to give a basic understanding of microorganism. Upon successful completion of the course, the student should be able to:

- Have a general notion of Microorganisms
- Know the useful and harmful effects of microbes to humans
- Differentiate prokaryotes from Eukaryotes
- Perform Preliminary basic laboratory techniques for identifying Microorganisms

Content:

General introduction to microbiology

- Importance of Microbes
- Cell types: Prokaryotes and Eukaryotes
- History of Development of MCB
- Structure and Function of a Composite Bacteria cell
- Classification and Identification of Microorganisms
- Criteria used for classification of Microorganisms

Parasitology:

Introduction to Parasitology

- Definition of some terminologies used in Parasitology
- Transmission and diseases caused by parasites
- Classification and characteristics of parasites
- Life cycles of some parasites (aetiologic agent, mode of transmission, infective and diagnostic stages)e.g*Entamoeba histolytica, Giardia lamblia, Trichomonas vaginalis, Leishmaniaspp, Trypanosoma spp,* Malaria parasite,*Ascarislumbricoides, Hookworms, Taeniaspp, Schistosoma spp*
- Quality assurance in the Parasitology laboratory
- Basic techniques used in the identification of parasites

Introduction to the laboratory

- levels of laboratories
- laboratory safety
- First Aid in the laboratory

Introduction to Haematology

- Overview
- Red blood cell Indices
- White blood cell Indices
- Blood groups and Transfusion
- ABO blood group system
- Rhesus Factor
- Erythrocyte Sedimentation rate

Introduction to Medical Parasitology

- Definition of basic terminologies in Parasitology
- Host/ Parasite Interactions
- Routine stool examination
- Examination of Malaria parasite

Introduction to Clinical Chemistry

- Specimen collection and processing
- Explanation of clinical Chemistry results: Blood sugar, heart disease risk, Iron status, Kidney Function tests, Electrolytes, Acid-base balance, Bone metabolism, Lipid panel, Liver Function tests, Cancer screening, Thyroid function and Urinalysis

Introduction to Bacteriology

- Bacterial structure
- Bacteria cell shape and arrangement
- Laboratory diagnosis of gonorrhoeae
- Laboratory diagnosis of tuberculosis
- Laboratory diagnosis of Urinary Tract Infections
- Laboratory examination of V/S and U/S

➢ **General Chemistry and Biochemistry**

Objective: The student should be able to;

- Describe the role of chemistry in modern life;

- Define some of the physical properties of drugs, e.g., solubility, melting point, boiling point and acid–base properties;
- Explain the terms pH, P^{ka}, buffer and neutralization.

Atomic structure and bonding:

- Describe the fundamental concepts of atomic structure; explain various aspects of chemical bonding;
- Discuss the relevance of chemical bonding in drug molecules and drug–receptor interactions.

Content: Physical Chemistry

- General introduction: Role of chemistry in modern life.
- **Atomic Structure:** orbitals and electronic configurations
  - Aufbau principle.
  - Pauli exclusion principle
  - Hund's rule
  - Hybridization
- **Atomic Structure and Bonding**
  - Describe the fundamental concepts of atomic structure.
  - Explain various types of chemical bonding.
  - Electronegativity and chemical bonding
  - Bond polarity and intermolecular forces.
  - Understand the significance of chemical bonding in drug-receptor interactions.
- **General Review of the Periodic Table**
  - Periodic Law
  - Alkali metals (group I)
  - Some medical uses of group I elements.
  - Alkaline-earth metals (group II)
  - Some medical uses of group I elements.
  - The transition elements
  - Medical uses of some transitional elements.
  - Halogens (group VII)
  - Medical effects of halogens.
  - Isotopy
  - The mole concept
  - Using moles to balancing & write equations
  - The empirical & molecular formulas of compounds
  - Allotropy
  - Alloy
  - Absorption & emission spectra
  - Radioactivity and Radiations
- **Acids and Bases**
- Volumetric analysis

ORGANIC COMPOUNDS:-

- Carbohydrates: Classification, types and functions
- Lipids and membranes: definitions, types, chemistry, nomenclature properties and classification
- Amino acids and Proteins: definitions, types, chemistry, properties, notion of peptide basics.
- Structural levels of Proteins, biological functions.

PRO113: Fundamentals of Nursing I : Overview-Concepts-History-Theories

Objective: At the end of this course, the student should master the concepts and theories in nursing and the nursing process.

Content:

1. **Concepts and theories in nursing sciences**
2. **Clarification of concepts**
    - Health,
    - Sickness ;
    - Life,
    - Death,
    - The health continuum ;
    - Signs and sickness;
    - Need ;
    - The concept of paradigme,
    - Theories ;
    - Modeles,
3. **Theories in nursing sciences**
    a. **Suzanne KEROUAC'sapproach**
        - Schoolneed;
        - School of interaction.
        - School of desiredneeds.;
        - School of health promotion;
        - School of the uniqueness of the human being.
        - **A view of Nursing authors**
            - Florence NIGHTINGALE ;
            - Hildegarde PEPLAN,
            - Martha ROGERS
            - Gerthud UJHELY,
            - Imogène KING,
            - Nancy ROPER,
            - Dorothy E. OREM
            - Myra LEVINE ;
            - Callista ROY ;
            - Affef MELLES,

- Virginia HENDERSON,
- Dorothy E. JOHNSON,
- Marjory Gordon ;
- MC GILL ;
- Betty NEUMAN,
- PENDER,
- IDA Orlando,
- Joyce Travelbee ;
- PARSE ;
- Leninger ;
- Laring WATSON ;

4. **Nursing care**
    1. Concept of nursing Science;
    2. Types and nature of nursing care

5. **Conceptual notions in nursing:**
    - Definition ;
    - Importance of nursing concepts ;
    - Criteria of choice of concepts in nursing.

6. **Virginia HENDERSON's concepts**
    1. Components of models
        a. Fondamental needs ;
        b. Dependance, indépendance ;
        c. Sources of difficulties
    2. Virginia HENDERSON'sanalysis table
    3. Virginia HENDERSON's model of data collection

7. **MARJORY GORDON's model**
    1. The 11 vital functions of man;
    2. MARJORY GORDON's model of data collection.

PRO114: Social Sciences I : Medical Sociology, Anthropology & Psychology

Objective:

- To outline key ideas about dysfunctional patterns of behavior.
- To discuss maladjusted responses resulting from defects in personality development and suggest ways that nurses can help.

Content:

- Introduction to psychology
- Major steps of life:-

- Emotional, Intellectual, psychomotor and psychosocial evolution of the individual: First age, second age, preschool, school, adolescence, adulthood, aging.
- Body structure and body image
- Personality
- Dynamic aspects of personality, unconscious, instinct, repression, motivation.
- Defense mechanism and adaptation.
- Emotional states: Feelings, emotions, fear, anger, distrust, anxiety.
- Comportments and behaviors.
- The different modes of relationship: social, educational, cooperative, authority, dependency, acceptance, mothering.
- Evolution of life and of the human being in his psychological dimensions.
- The doctor – patient relationship: specificities.

Sociology:

- Introduction to sociology
- Concept of group: Social groups (family, work groups, institution).
- Dynamics of small groups
- Dynamics of conflicts: Leaders
- Communication and communication networks
- Evolution of life and the human being in his social dimensions.

Anthropology / Ethnology

- Notions of anthropology and ethnology
- Anthropology, ethnology
- Customs and cultural PWnomena
- The innate and the acquired myths and beliefs
- Cultural attitudes to health, illness, death.

PRO115: Fundamentals of Nursing II: Human Development Across The Life Span

Objective: At the end of this course the student should:

- Understand the evolution of nursing;
- To master the life cycle of from birth to death.

Content:

1- History of the nursing profession.

Objective: To understand the steps of the evolutive process of nursing,

Content:

- Health in primitive cultures;
  - Before Christ ;
  - Middle age,
  - Florence Nightingale'sera ;
- Organisation nursing ;

- Role of the nurse;
- History of nursing in Cameroun.
- National order of paramedical personnels.
- View of the other professions.

2- Life Span and Human Growth and Development

- Prenatal care and development
- Newborn to two years
- three to five years
- Six to ten years
- care and protection of children
- eleven and nineteen years
- twenty to thirty-nine years
- forty to sixty five years
- career preparation
- opportunities in education and training

PRO116: Clinical Placement I(Immersion)

PRO117: Bilingual training, ICT I

- **English and French expression: 2 credits (30 hours); L, T, P, SPW**

1. **Form of words in French**
   - Prefix, radical;
   - Root, suffix.
2. **Explanation of words and group of words**
3. **Morphosyntax and rhetoric**
   - Components and structure of the sentence:

- Simple sentence;
- Complex sentence;
- Sentence composed.

- Figures of style:

- Figures of analogy;
- Figures of amplification;
- Figures of opposition;
- Figures of mitigation.

4. **Administrative correspondence and professional**

- The different parts of a administrative correspondence and the administrative style
- Professional Correspondence:
- Note of service;
- Record (activity, mission);
- The report (activity, mission).

5. **Professional correspondence to individual dominance**
    - Application for employment;
    - CV;
    - Letter of motivation.
6. **Methodological Considerations on the written exercises**
    - French composition;
    - Contraction of text:
    - French composition: Reminder methodological and implementation;
    - Contraction of text: methodological reminder and application.
7. **Study of the communication situations.**
    - Identification of the factors in the situation of communication (transmitter, receiver, code, channel, message, context);
    - Situation of communication and verbal interactions;
    - Study of the elements para verbal cues (kinesthetic, proxémiques, MIMO-gestural, etc.;
    - Identification and handling of figures of expression and thought metaphors, irony. Satire, parody, etc.).

➢ **Technique of the information and of the communication 1: 1 credit (15 hours); L,T, SPW**

1. Concepts and architecture of computers
2. Definitions: computing, information, computer, data, program, software, drivers
3. System of enumeration of base 2, the unit of measure of the information and its multiple
4. Components of the computer (hardware and software)
5. Study of an operating system
6. Study of a text treatment software: Microsoft Word
7. Study of a spreadsheet/Microsoft Excel
8. Study of a presentation software: Microsoft PowerPoint

PRO121: Anatomy and Physiology II

➢ **Anatomy physiology 2: 4 appropriations (60 hours); L, T, P, SPW**

1. **Cardiovascular system (1 Credit)**
    - The heart;
    - The general circulation;
    - The different parts of the circulatory system (arteries, system door, the veins, the pulmonary circulation);
    - Verification of the effectiveness of the Movement: blood pressure, pulse.
2. **The respiratory system (0.5 credit)**
    - Descriptive anatomy and appliquéedes respiratory tract;

- Mechanism of the ventilation.
- The respiratory échangesgazeux;
- Lesmodifications of the respiratory system during pregnancy.

3. **The digestive system (0.5 credit)**
   - Descriptive anatomy of the digestive system;
   - The bodies annexs to the digestion - The mechanism of digestion;
   - The Digestive changes during the course of thepregnancy.
4. **Urinary system (0,5crédit)**
   - Anatomy of the kidney;
   - Schematic and functions of the various parts of the 2 types of nephron;
   - Mechanism of production of urine (glomerular filtration, tubular reabsorption, tubular secretion);
   - Anatomy and Physiology of the ureters of the bladder and the urethra ;
   - Physiological changes of urinary system during the pregnancy.
5. **The genital system (0.5 credit)**
   - Anatomy of the genital system the masculine and the feminine and the glandesannexes;
   - Physiology of the semen: sperm analysis;
   - Physiology of the genital system masculine: spermatogenesis;
   - Physiology of the genital system female: oogenesis, ovarian cycle, hormonal regulation of the ovarian cycle, menstrual cycle, effects of estrogen and progesterone, the sexual response of the woman; - anatomy physiology of the breast.
6. **Osteology, Arthropologie and general Myology (1 credit)**
   - The OS and the skeleton;
   - The Joints - The musculature; - The baNUS at the woman.

➢ **Semiology: 1 credit (15 hours) ; L, T, P, SPW**

- Definition, etiology, sign and symptom of a few affection of:
  - The Respiratory System
  - The urinary tract
  - The circular device
  - The Digestive System
  - Nervous System
  - Sense Organs
  - Dermatology
  - Musculoskeletal Health
  - Genitourinary.

PRO 122: Microbiology II (Virology-Mycology-Immunology)

Objective: This course is designed to give a basic understanding of microorganism. Upon successful completion of the course, the student should be able to:

- Have a general notion of Microorganisms
- Know the useful and harmful effects of microbes to humans
- Differentiate prokaryotes from Eukaryotes
- Perform Preliminary basic laboratory techniques for identifying Microorganisms

Cultivation of bacteria

Types of culture media

Bacteria growth: Batch and Continuous systems, various phases of a bacteria growth curve

Microbial growth requirements: Physical requirements (Oxygen, temperature etc.), Chemical requirements (Nitrogen, Carbon etc.) and Growth factors (Vitamins, amino acids, pyrimidine and purine bases)

Introduction to viruses, General characteristics of viruses, General structure and functions of the various parts of a virus, Classification of viruses: In terms of nucleic acids, morphology, Viral replication: adsorption, penetration, uncoating etc. Terminologies related to the control of microbial growth (sterilization, disinfection, bacteriostatic, bactericidal etc.)

Introduction to Mycology

- Beneficial and harmful importance of Fungi
- General characteristics of Fungi
- General life cycle of fungi
- Sexual and Asexual reproduction in fungi
- Types of Mycoses
- Laboratory diagnosis of Mycoses

PRO123: Fundamentals of Nursing III: Nursing Sciences and First Aid

Objective: The student should understand the nursing process;

Content

1- The nursing process

- Analysis and interpretation of results.
- The concept of nursing diagnosis;
- The nurses intervention;
- The nursing care plan and register;

Nursing care Planification

2- First Aid

- Definition, concept of first aide, hemorrhage (bleeding), fainting, choking and drowning,

- Shock and electrocution, coma (unconsciousness) and heat stroke (sun burn), fractures, sprains and strains and dislocations, poisoning, animal bites and insect stings,

PRO124: Public Health: Epidemiology-Demography-Environmental Sanitation & Health Promotion

Objective: To master of the elements of public health related to epidemiology, demography the environment and health promotion.

Content:

- **Epidemiology: 1 credit (15hours); L, T, P, SPW**

1. Importance of the epidemiology, preventive care
2. Indices of community health in relation with the epidemiology
3. Analyticalmethods of demography
4. Program of investigation in Health
5. Epidemiological study of acute diseases and chronic conditions
6. Methodology and Statistics in the field of research
7. Analysis of the data
8. Introduction on the insects (brachycères, nematogeres, marangonins, arachnids malacology)

- **Demography: 0.5 credit (7,5hours); L, T, P, SPW**

1. Definition
2. Purpose
3. The concepts of demography
4. The characteristics of the population
5. Concept of Gender, ratio, increased age pyramid
6. Stratification of the population
7. Interpretation

- **Health Promotion:0.5 credit (7,5 hours); L, T, P, SPW**
  - Health Promotion;
  - Definition;
  - Different aspects;
  - Persons likely to participate;
  - The techniques of communications.
- **Environmental Health: 1 credits (15 hours); L, T, SPW**

1. **Hygiene and Sanitation in the middle**
   - **PersonaLygiene**
   - Physical (clothing, cleanliness, sport);
   - Mental (sleep, noise, addiction).
   - **Food Hygiene**
   - Food (balance, conservation);
   - Drinking water (domestic treatment of drinking water);
   - Addiction (tobacco, alcohol, drugs).

- **Hygiene of the Environment**

- Habitat (overcrowding, facilities, wastewater, waste);
- Collective facilities.

2. **Hospital hygiene**
   - Definition;
   - Importance;
   - Purpose;
   - Individual measures;
   - Collective measures Institutional andthe nosocomial infection:
     - Definition;
     - Contributing factors;
     - Plan to Combat (organization of the fight);
     - Hygiene of the patient (toilet, bed linen, etc.);
     - Hygiene of the staff (held, hands);
     - Hygiene of care and of the equipment of care (asepsis, antisepsis, decontamination, disinfection, methods and sterilization procedures physical and chemical);
     - Specific hygiene in the surgical blocks;
     - Remediation of the hospital environment (water, waste, facilities);
     - Regulation of the movement of patients and staff in the hospital environment.
3. **The promotion of health**
   - Health Promotion;
   - Definition;
   - Different aspects;
   - Persons likely to participate;
   - The techniques of communications.

PRO125: Medical Nursing I

Objective: To take care of patients in a medical ward.

1. **Content:**

a) Clerking

- Guidelines for collecting history
- Importance of health history
- Components of health history taking
- Physical examination (PE)
- Importance of physical examination
- Guidelines for carryout a PE
- Techniques for carrying out a PE
- Vital signs
- Importance of vital signs

- Recording PE and principles guiding recoding of PE
- Guidelines for vital signs
- Technique

b) Temperature

- Clinical thermometer
- Sites for temperature assessment
- Few keys features surrounding temperature

c) Pulse

- Assessing pulse (radial)
- Pulse characteristics

2. Respiratory Rate

- Dyspnea

3. **Arterial Blood Pressure** (BP)
   - Assessing BP
   - Drug administration
   - General rules for administering medication
   - Principles of administering medication
   - Maintaining safety in drug administration
   - Calculating drug doses
   - Medication errors
   - Routes and techniques of drug administration
   - Enteral routes
   - Parenteral routes
   - Details on routes of drug administration

✓ Oral medications
✓ Injectable
✓ Intra- muscular routes

- Sites identification

a) Buttocks
b) Thigh
c) The upper arm

- Subcutaneous route (procedure)
- The IV route

PRO126: Clinical Placement II (Immersion)

PRO127: French and English for medical profession II – ICT II

Objective: To develop communication skills in French and English language and thus enhance patient relationship as needed.

Content:

1. Grammar
2. Different parts of the human body

3. Conversation in French and English as specific to health care
4. Translation of Medical Terms, prescriptions, technical and protocol forms, drug dispensation notices
5. Drafting of reports
6. Documentation research
7. Use of data sheets and protocols in the French language.
8. Health structures, premises, equipment, professional categories
9. Drafting of researchtopics
10. Dissertation on the professional articles
11. Interviews - Speech unto etc. ….
12. Health structures, premises, equipment, professional categories
13. Hospitals
14. The Hardware
15. The staff
16. The Role
17. The pathologies
18. The drugs

- **The pathologies by systems**
  - Urinary system;
  - Cardiovascular System;
  - Digestive system;
  - The endocrine system.
- **The dispensing of drugs**

➢ **Technique of information and communication 2**

- Creation of a simple database with a spreadsheet (How to Give a name to a cell range)
- Validation of Data in a range of cells on a spreadsheet
- Creation of the statistical tables simple (modality, workforce, frequency) and automatic filling with functions such as NB, NB.If and NB.If.ENS, Average, Sum, if
- Creation of graphics from statistical tables
- Presentation and use of a statistical software (ex: Epi Info)
- Creation of a questionnaire on EPI info or other
- Data entry and analysis
- Definition of the concepts of the computer network
- Presentation of the types of media and networks
- Presentation of Internet (Connection, research, download)
- Networks withoutwires
- Learning of a software application
- Numbering system
- Computer Security: Virus and antivirus

PRO231: Material and Workshop Technology

Objective: Students would have competence in practicing effectively and safely within a workshop environment. They will be able to explain the important properties of various types of materials and have knowledge of essential workshop safety.

Content:

Material Science

Metal & Alloys: Fundamentals of metals and alloys both ferrous and nonferrous. Properties, testing and inspection of metals and alloys, heat treatment of metals.Powder metallurgy, surface coating of metals.

Wood: Wood, types, seasoning, preservation, lamination properties and adhesives for wood.

Wood work: Introduction to Wood, wood work and wood working tools. Pattern making and making of various kinds of joints.

Leather: Leather, types, tanning, preservation, lamination, properties and adhesives for leather.

Fabric: Fabric types, properties, utilization, selection and quality control.

Polymers & composite materials: Introduction to Plastics, type of plastics and molecular structures. Relationship of properties to structures. Monomers, Polymers, additives, Mechanical properties, effect on properties of method of production.

Fabrication processes, Effects of fabrication, process, micro structural changes, shrinkage and other degradation during processing, environmental effects. Thermoforming plastics, their fabrication process, thermosetting plastics and fabrication process

Composite materials and their uses-Resin: Acralyic and Polyster. Elastomers, H.D.P.E. PP, PP-CP, Visoelastic behaviour of plastics. Introduction to fiber reinforced plastics. Introduction to and their processing especially various techniques of moulding and lamination.Joining of plastics, welding, adhesives and their effect on structure and plastics properties.

Foams: Different types of foams used in P&O especially Latex, Polyurethane, polyethylene and other kind of rigid/semi rigid/ flexible foams. Plaster of Paris & Silicon and its application procedure in Prosthetic & Orthotic techniques

Workshop Technology

General: Introduction to bench work, hand tools, measuring tools and instruments. Equipment for mass production, introduction to lathe machine and its operation, milling machine and its operations, tooling, attachment, Shaping machine and its uses.Grinding machine, Drilling Machine Abrasive machine etc. Special tools and equipment used in fabrication of orthoses and prostheses.

Compressors, Vacuum Pumps and Dust Collection Equipments

Cutting Tools (Chisels, Saws and Metal Cutters)

Pneumatic Tools

Power Cutting tools

Workshop Safety & Hazards and Care
Mechanical working of metals such as steel and aluminum.
Fundamental of riveting, soldering, brazing and welding.
Workshop Technology Practical Practice: Practical work on workshop practices. Practical training on lathes, Drilling Machine (Bench and Pedestal), Grinding Machine, Router, hot air oven, sanding machine, heat gun, pneumatic machines and other machines.Practical work on various materials and tools and its use in prosthetics & Orthotics.

PRO232: Applied Mechanics & Strength of Materials

Objective: The students will be able to demonstrate an ability to understand and utilize the mechanical principles and other concepts of strength of material.

Content:

General Mechanics: Definition of Mechanics, Foundation material on Units, dimensional homogeneity, scalar and vector quantities, Co-ordinate systems, Newton's laws. Resolution and summation of forces and moments in two and three Dimensions, equivalent force systems, free body diagrams, equations of Equilibrium, plans and space frame analysis. Parallel and non- parallel Forces, torque.Linear and angular motion, uniform acceleration, friction, inertia, moment of inertia, dynamic equilibrium (translation/rotation), Energy, momentum.

Simple stress & Strain: Definition of stress and strains, factor of safety stress, modulus of elasticity, longitudinal strain and internal strains. Possion's ratio etc. stress and strain curve, statement of formulae relating between different modules, simple problems to understand the above principles of composite bars-formula relating to loads and strains in individual members simple to understand the above relations.

Mechanics Practical

General: Practices on parallel and non-parallel forces, torque. Linear and angular motion, uniform acceleration, friction, inertia.
Design concept: Buckling, theories in failure, fatigue and stress concentrations, connections, Shear force and bending moment diagrams, centroids, 2nd moment of area and mass, theorem of parallel axes, bending stress, torsional stress of circular shafts, combined axial and bending stresses. Combined and torsional stresses, combined axial bending torsional stresses. Open and closed helical springs and beam deflection.
Control systems: Introduction to control theory and its applications in Prosthetics and Orthotics.

Ecogonomics with applied mechanics

General: Introduction to definition and scope in modern industrial social studies on Machine or man oriented topics. Displays devices for transmitting information from machine to man.Controls in information from man to machine. Safety factors, Pollution, noise, fumes, atmosPWric pollution if motion study in relation to Ergonomics principles.

PRO233: Engineering Drawing

Objective: The course is designed to assist the students to acquire an introduction to concepts of drawing instruments and their uses, general principles and the basic elements of technical drawing.

Content:

Introduction: Drawing instruments and their uses. Sizes and layout of drawing sheets.Item references on drawings and item lists.Planning on assembly.

General Principles: Folding of Drawing prints Scales. Plain and diagonal, Lines, Letterings.General principles of presentations. Section and other conventions Conventional representations circle, Tangent Ellipse. Cycloised Involute of circle.

Fundamentals: Dimensions on technical drawings. Indications of linear and angular tolerance on technical drawings.Orthographic projections of points, lines, simple objects and combinations.Isometric views, Auxillary view, Drawing of screw thread form Bolts Screws and Screw joints, weld and welded joint dimentioning and sketching of P & O components/ parts, pulley shaft, coupling, etc.

Design: Design calculations and its applications for Prosthetics & calculation Orthotics devices.

General Sketching: Sketching for preparing assembly, workshop drawing. Various parts and Components used in prosthetics and orthotics, Basic idea of design analysis, itemisation empiricism, approximation and syNTDesis. Detail diagrams of all kind orthoses, prostheses and mobility aids.

Practical: All kinds of engineering drawing practice.

PRO234: Biomechanics I

Objective: The understanding of Bio-mechanical principles of Prosthetics and Orthotics will be the foundation of the work of the students. It is essential to have a sound theoretical knowledge of the subject and students are able to demonstrate the rigorous application of these principles to practical P&O situations and in the analysis of those situations.

Content:

Basic Concepts in Biomechanics: Kinematics and Kinetic. Types of Motion, Location of Motion, Direction of Motion, Magnitude of Motion, Definition of Forces, Force of Gravity, Reaction forces, Equilibrium, Objects in Motion, Force of friction, Concurrent force systems, Parallel force systems, Work, Moment arm of force, Force components, Equilibrium of levers

Joint structure and Function: Joint design, Materials used in human joints, General Properties of connective tissues, Human joint design, Joint function, Joint motion
Biomechanics of normal foot, pathological foot, foot arches, normal and surgical foot wear.

Human Movements: Normal gait: general features of gait, gait initiation, kinematics and kinetics of gait, energy requirements, Pathological gait
Introduction to EMG studies and recording EMG

Joint Force Analysis: Body segment parameters, joint forces during swing and stance phase, force analysis on foot and ankle joint, knee joint and Hip joint.

Human locomotion and Gait analysis: Introduction to different ways to do gait analysis by using force plate/TV analysis/ electromyography studies, energy studies, gait repeatability, variation due to age, variation due to footwear, Orthoses/Prostheses. Trans Femoral Amputee, gait analysis and deviations, gait variations due to alignment or pathological conditions.

Biomechanics of Symes prosthesis, partial foot prosthesis, below knee (Trans tibial) prosthesis.

PRO 235: Prosthetics Science I, Orthotics Science I

- **Prosthetics Science I**

Objective: This subject is delivered in a coordinated manner with the Practical part of the Prosthetic Science course. The student will be required to acquire and comprehend the necessary theoretical knowledge and to be able to integrate this effectively in clinical practice.

Content:

Introduction: Introduction to Prosthetics, definitions of various terminologies, Historical development in Lower Extremity Prosthetics in India and abroad.

Prosthetic Feet: Various types of Prosthetic feet. Conventional foot. Rocker, SACH foot, modified SACH Foot. Jaipur Foot, Seattle foot, Flex foot, Quantum foot, Peg Roelite foot, Carbon copy foot, Comparatives studies of prosthetic feet. Single axis, Double axis, Multi-axial foot, other kinds of feet etc. Heel Height adjustment, Adjustable ankle, various kinds of ankle mechanisms.

Partial Foot: Various types of Partial foot prosthesis. Biomechanics of Partial foot prosthesis, Prescription Principles, Materials used for partial foot prosthesis, various cast techniques of Partial foot prosthesis, Fabrication Technique for partial foot prosthesis.

Syme's: Various types of Symes Prosthesis, Prosthetic components, Prescription criteria, Principles. Materials used for Symes prosthesis, casting techniques. Cast modification. Fabrication Technique for Symes (P.T.B. type) prosthesis.Fabrication Technique for conventional Symes prosthesis.

Trans Tibial: Various types of trans-tibial prostheses including Jaipur limb & ICRC technology, Prosthetics Components – both conventional and modular. Trans-tibial Prosthetic Prescription Criteria and principles. Materials used in Trans-tibial Prosthesis. Measurement and casting techniques for Trans-tibial prosthesis. Cast modification. Fabrication techniques for trans-tibial prosthesis. Fabrication Technique for trans-tibial Conventional Prosthesis – both Open and close ended socket, Different types of socket designs – PTB, PTS, PTBSC, PTB-SCSP, Different types of suspension.

Gait Deviations and Analysis: Person with Chopart, Symes, and Trans-tibial prosthesis. Check-Out Procedures with Chopart, Symes & Trans-tibial prosthesis.

Prosthetics Practical: Fabrication of Partial foot prosthesis, Chopart Prosthesis, Symes and various types of Tran's tibial prosthesis using different technology.

- **Orthotics Science I**

Objectives: This subject is delivered in a coordinated manner with the Practical part of the Orthotic course. The student will be required to acquire and comprehend the necessary theoretical knowledge and to be able to integrate this effectively in clinical practice.

Content:

General: Introduction to Orthotics, definitions of various terminologies, History of Orthoses in India and abroad. Various materials used in Orthotics.

Different types of Orthoses: Users/Client's assessment and prescription criteria, Measuring and casting, cast modification, three point force system, fabrication, fitting, aligning, checking out and finishing of the following devices:

Shoe Modification: Medial/Lateral raise (Inside /outside shoe), M.T. Bar (Inside / Outside shoe), Arch support, Meta tarsal pad, Calcaneal heel wedge, Heel raise, Thomas Heel, Heel pad for Calcaneal spur, 'T' strap (Medial and lateral), Fixation of stirrup plate in shoes/ Sandal, Various types of Arch Supports – flexible/semi rigid/rigid/custom moulded, SMO-Custom moulded Supra malleolar orthosis. Various types of Foot Orthoses for diabetic feet and other sensory deficiencies.

AFO (Ankle foot orthosis): Conventional AFO-, Plastic AFO (custom moulded), Articulated A.F.O & various types of ankle joints

Club foot Orthosis: Orthotic management of CTEV, Ankle support
Orthotic management of Anesthetic Foot.
Orthosis for the management of fracture below knee.

Practical: Different types of foot Orthoses, Shoe modifications, and all types of Mechanical Ankle Joint, conventional & Custom molded (A.F.O.) and fracture Orthosis for below knee.

PRO236 : Clinical Placement III (Rehabilitation centers)

PRO237: Civic Education, Ethics and Research Project

- **Ethics Civic Education**

Content:

- **Concepts:**
  - The citizen - the nation - the State,
  - Public property unto collective property,
  - The freedoms;
  - The public service;
  - Problem of ethics,
  - Ethics, Law and reason;
  - Management and ethics of responsibility;
  - Ethics and management;

- Civics
- Deontology
- Moral consciousness
- The universal declaration of Human Rights
- Good governance in public services
- The importance of civics to the life of the nation
- Functions of the state and its citizens
- Deontology, Professional ethics and professionalism
- Relationship between morality, law and ethics
- Codes of ethics

- **Research Project**

Description

This course focuses on providing an introduction to research methods and designs relevant to health science undergraduate students. This course will focus on experimental and non-experimental, and quantitative and qualitative research methods. It will equip students with the practical basic research skills necessary for their identifying a researchable problem, critical literature review, research proposal formulation, data collection/analysis and Report writing within the healthcare field.

Objective: At the completion of this course, students should be able to:

- Understand the role of bias and confounding and how to control for these in selection of study design.
- Appreciate the role of chance/random error, and the appropriate choice and application of statistical testing to assess this.
- Demonstrate the skills and knowledge required for independent or group research.

Construction of a Research proposal: **Background:** Literature review, formulating the problem statements, justification of studies, objectives, framing the questions according to general and specific objectives; is developing a testable hypothesis to achieve the objectives for quantitative research selection, referencing, etc.; Ethical considerations; Work plan: personnel; timetable project administration; Plans for dissemination.

Data collection and management: Design and Pretesting of measuring instruments (reliability and validity of instruments);training of interviewers; quality control of measurements; computerization, checking and validating, measurements; the issue of missing observations, statistical summarization of information; testing of hypothesis.

Analysis & presentation of Results; Report writing and format.

PRO241 : Fundamentals of Electricity and Electronics

Objective: The student will have knowledge of basic principles of electricity and electronics with particular reference to applications in prosthetics, orthotics and workshop practice.

Content:

Basic Concepts: Introduction to SI System of units, charge, current, resistance, potential differences, electromotive force, Energy power, Voltage and current Relationship, energy storage, DC circuits, AC circuits, sine wave, Frequency, Period, phase, RMS value, inductive and capacitive reactance.

Resistors: Resistors sensitive to temperature, strain and light, Resistors in series and in parallel.

Transformers: Principle of the transformer, voltage, turns and current ratios.

Semi Conductors: Outline Concepts of semiconductors and insulators. Conduction in intrinsic and extrinsic semi conductors.

Amplifiers: Amplifiers as a system element. Operational amplifiers and their ideal characteristics.The small single equivalent circuit having a controlled source. Voltage and current gain, the decibel power gain, Noise and drift voltages, Source in amplifiers and bio-systems.

Feed Back: The general Feedback equation, Feedback Voltage series, negative feedback and loop gain, loop gain Accuracy, input resistance, ouPHut resistance, band width of noise. Feedback as a control mechanism in the wider sense, Positive feedback – instability and self-oscilation in amplifiers and oscillatiors.

Measurements: Electronics measuring instruments..Summary of recording instruments. Concepts of resolution and accuracy applied to digital and analogue instruments. Transducers for temperature, light, pressure, sounds, description, specification and use in circuit.

Myoelectrodes: Technology of metal and metal paste electrodes, the equivalent circuit between electrodes, stability, source of unwanted voltage electrode systems. Other types of myoelectrodes micro electrodes, implanted electrodes, comparison with surface electrodes.Sensors, microprocessors etc.

Electrical Safety: Description of single phase and three phase supply system and voltage involved. Function of line, natural and earth in single phase system. Current practice in pin connection and colour codes.Simple safety procedure to be taken when servicing equipment.Effect on safety of fault conditions.Fuses, Conductors and earth leakage detectors – miniature circuit breakers (MCB). Voltage regulators integrated circuits.

Bio-Electricity: Biological Potentials, Muscle action potentials, Electro-myography and Myo-electricity

PRO242: Physical Medicine & Rehabilitation, Orthopaedics & Amputation Surgery

- **Physical Medicine & Rehabilitation**

Objectives: The course is designed to assist the students to develop understanding of the health and socio-economic context of people with disabilities in the community and their role and the role of CBR and introduce different members of the clinic team and theoretical principles of rehabilitation.

Content:

Part I: Psychology, Sociology and vocational

Disability & development:

Background to social, political & economical issues in India & other low-income countries.Affected on poor who live in rural & urban areas. Disability & women introduction to community based rehabilitation as compared to the existing medical model & its function. Introduction to impairment, disability & handicap. Introduction to disability issues, Government schemes & initiatives, legislation, local resources available & referral. Income generation schemes, purpose of Sanghas / group of PWDs. Access, Adaptation & changes of environment where people live or work, PWD Act.

Psychology: introduction to psychology, outline of psychology & the individual, behavior, intelligence & abilities, learning & remembering, psychological development, cognitive process, personality, moral development, psychological aspect of disability. The role of the family, child with the disability, parent of the disable child. Acceptance of several disabled persons, social- sexual relationships, independence living.

Sociology: introduction to sociology & outline of society, definition, outline of social works, nature of social organization, non –governmental organization & its role in prosthetics & orthotics, structure & function of social institution, village as community, social changes, social problems, social welfare, vocational rehab. , Employment, self-employment, removing environmental barriers, recreation for the disabled, community welfare organization, social welfare programs, professional & social work in medical setup, M.S.W in rehabilitation, practical & environment difficulties of patient in use of appliance, outline of educational aspect, job analysis, job placement.

Community Based Rehab. : What is CBR & its need- what way it is different that IBR , simple knowledge about other disabilities, its prevention & its management ,to where to refer ,when to refer, role of other professionals in CBR, early identification & early intervention , how to work as a team in CBR /IBR structure , simple techniques to make CBR activities more purposeful.

Part II: PMR Medical Aspects (Specific disorders), Physiotherapy, Occupational Therapy

General: introduction to health cares system, rehab. In health care, rehab.Under various ministries, introduction to Institution Based Rehab. (IBR) and Community Based Rehab. (CBR).Prosthetics & orthotics in CBR & role of CBR worker

in P&0. Introduction to general medicine & disease, chemical & physical agent causing diseases, outline of metabolic disorders e.g. Diabetes mellitus, deficiency diseases e.g. Vit.D deficiency & Vit. C deficiency.

Specific disorders : periPWral nerve injury , poliomyelitis ,cerebral palsy , muscular dystrophy, club foot, spina bifida ,hemiplegia, spinal cord injury (paraplegia / quadriplegia) , tuberculosis & perthes disease, leprosy , burns, Erb's palsy ,tumors- malignant & benign.

Sports injuries: introduction to sports injuries, common sports injuries & other management, mechanism of injury to hip, knee, ankle, shoulder, elbow, wrist & hand in various sports & outline of their orthotic management.

Rehab. Therapy: introduction to physiotherapy & occupational therapy, child development in brief- milestone & delayed milestone, assessment procedure, evaluation of muscle power, range of motion, checking of joint stability, checking of pelvic tilt, use of Goniometer, checking of muscular atrophy/ dystrophy, functional assessment which includes ADL, stretching, strengthening, breathing exercises, therapy at post – surgical stage (re- educating the muscle, maintaining ROM, preventing.

Stump care & care of non-amputated limb, exercise through games involving parent & guardians, pop bandage application for temporary splinting &correction of simple deformity, stump bandaging application etc.

Physical medicine & Rehab. : Concept of total rehab. , Rehab. Team & role of each of the member of the team, introduction to physical medicine, principles of clinical examination, diagnosis & treatment, different aspect of physical medicine & rehab. , Rehab. Aspect of visually handicapped, hearing handicapped & mentally retarded.

Practical: practical aspects of physiotherapy, occupational therapy, physical medicine & rehab.

- **Orthopaedics & Amputation Surgery**

Objective: In this unit the students learns about the various orthopedic conditions in detail with review of the disabling conditions. It also covers the various common surgical techniques and its influences in the orthotics and prosthetics fit and design.

Content:

Orthopaedics

General: introduction, principles of Orthopaedics, fracture & types of management.

Inflammation: outline of Inflammation, osteomyelitis, and inflammation of joint. Rheumatoid arthritis,, infective arthritis , tuberculosis arthritis ,osteoarthritis, ankylosing spondylitis, arthritis of hemophilic joints, neuropathic joints, inflammation of tendon sheath & bursae, contractures , posture etc. metabolic diseases of bones e.g. Rickets , osteomalacia , gout, scurvy, etc poliomyelitis & all its effect.

Spine: outline of torticolis, cervical rib, spina bifida, spondylolisthesis, scolosis-all types, kyposis, lordosis, spondylosis, prolapsed of intervertebebral disc.
Hip: outline of dislocation (congenital, traumatic, pathological, paralytic & spastic), coxa-vara, and coxa-valga.

Knee: outline of meniscal tears, dislocation of patella, genu valgus, genu varum, genu recurvatum, ligamentous injuries.

Ankle & foot: outline of sprain (acute & chronic) ,CTEV ,calcaneo-varus & pes valgus, hallux valgus & varus , calcaneal spurs , metatarsalgia, planter fascitis , anesthetic feet , bunion.

Shoulder: outline of recurrent dislocation, bicipital tendonitis & periarthritis.

Elbow: outline of cubitus varus& valgus, Madelung's deformity, tennis elbow, Volkmann's contracture, Dupuytren's disease, claw hand, De- quervain's disease & claw hand.

Wrist & hand: tenosynovitis, mallet finger. Carpal tunnel syndrome.

Amputation surgery:

General: indication / causes , general principles , types of amputation .i.e Guillotine , Flap, osteoplastic Myoplastic , osteo-myoplastic ,individual preparation for prosthesis, ideal stump, preoperative & post-operative prosthetic management techniques in general.

Amputation: amputation surgery in lower & upper limb , amputation in special circumstances , like in infant & children , congenital limb deficiencies & its universal classification , ischemic limbs , elderly persons & malignancy.

Orthopaedic practical:

General: demonstration of different condition & relevant X- ray films, how to read from X-ray, its simple assessment & p&o management techniques.

PRO 243: Biomechanics II

Objective: The understanding of Bio-mechanical principles of Prosthetics and Orthotics will be the foundation of the work of the students. It is essential to have a sound theoretical knowledge of the subject and students are able to demonstrate the rigorous application of these principles to practical P&O situations and in the analysis of those situations.

Content:

Through knee Biomechanics: Through knee Prescription Principles, socket biomechanics and alignment techniques.

Trans Femoral Prosthetics Biomechanics: General Socket biomechanics, Trans Femoral socket biomechanics and analysis of socket forces. Analysis of Trans Femoral Prosthetic components.

Gait deviation: Gait deviation while using while using Foot Orthoses (FO), Ankle Foot Orthoses (AFO) and trans-tibial prostheses.

Above knee Orthotics Biomechanics: Biomechanical principals of various kinds of above knee Orthosis especially Knee Ankle Foot Orthosis and Floor Reaction Orthosis. Biomechanics of HKAFO especially to prevent scissoring. Three/ four/five

point force system. KAFO and HKAFO gait deviations due to alignments or pathological conditions. Gait analysis of KAFOs and HKAFOs with various types of crutches.

Combined and torsional stresses, combined axial bending torsional stresses. Open and closed helical springs, beam deflection. Design test standards/materials/Philadelphia Loads/ISO. Design calculations for P&O devices/BIS.

PRO244 : Prosthetics Science II

Objective: This subject is delivered in a coordinated manner with the Practical part of the Prosthetic Science course. The student will be required to acquire and comprehend the necessary theoretical knowledge and to be able to integrate this effectively in clinical practice.

Content:

Knee Joints: Different types of Endoskeletal and exoskeletal knee joints - Single axis knee joints, Polycentric knee joints, Free knee, Constant friction knee joints, Variable friction Knee joint, microchip control knee, hydraulic knee joint, swing Phase control knee joints, Stance Phase control knee joints etc.

Hip Joints: For above knee as well as for hip disarticulation/ hemi- pelvictomy – all types of hip joints especially single axis and Swivel type.

Through Knee Prosthesis: Various types of through knee prosthesis - Through knee prosthetic Components. Materials used for through knee prosthesis. Casting techniques for through knee prosthesis, Cast modification, Fabrication Techniques of through hip prosthesis, through knee Gait analysis and deviations, through knee Check-out Procedures.

Trans Femoral Prosthesis: Types of Trans Femoral Prosthesis. Trans femoral Prosthetic Components. Trans Femoral Socket designs. Casting and measurement techniques, Cast modification, Fabrication techniques of Trans Femoral socket. Various types of suspension used in Trans Femoral Prosthesis

Endoskeleton/modular: all common types, Trans Femoral Gait Analysis, Trans Femoral Check-out Procedures.

Prosthetics Practical: Fabrication of all types of above Knee prosthesis and through knee prosthesis.

PRO245: Orthotics Science II

Objective: This subject is delivered in a coordinated manner with the Practical part of the Orthotic course. The student will be required to acquire and comprehend the necessary theoretical knowledge and to be able to integrate this effectively in clinical practice.

Content:

Above knee Orthotics: Types of knee & Hip joints

Orthotics Components: Prescription principles of various types of Knee Orthoses (KO), Knee Ankle foot Orthoses (KAFO), Hip Knee Ankle foot Orthoses (HKAFO). RGO & ARGO Orthoses

All types of K.A.F.O., H.K.A.F.O. FRO, RGO & ARGO etc. and also Orthoses for management of C.D.H., C.P., Paraplegics, and Legg Calve perthes diseases, Spina Bifida, Leprosy and Hemiplegia etc.

Fabrication: Cast and measurement techniques, appropriate selection of materials and components, cast modification, fabrication and alignment technique, using of different technologies – its advantages and disadvantages, Accommodation of limb length discrepancy while designing orthosis, Gait analysis and check out procedures.

Practical: Orthoses in Lower Motor Neuron Disorders, Orthoses in Upper Motor Neuron Disorders, various types of knee Orthoses, Weight relieving orthosis, Floor reaction orthosis, Toronto Brace, Low cost Orthoses, Bilateral H.K.A.F.O, Orthoses in Arthritis, Orthoses in Fractures, Orthoses in Hemophilia, Orthoses in Progressive Muscular Dystrophy, Orthoses in Juvenile Disorders etc.

PRO246: Clinical Placement IV (Rehabilitation center), Introduction to Operational Research

Objective: At the completion of this course, students should be able to:

- Understand the concepts of research in the biomedical sciences and be able to apply them
- Be able to accurately describe the fundamental concepts and approaches in qualitative and quantitative research methodology.
- Be able to find and appraise the available research literature through the use of valid resources, and thereby provide informed opinion.
- Be able to raise research questions in professional practice and apply appropriate research methodology to investigate and solve the research questions.
- Write a research proposal for approval by the Ethics Committee.
- Understand the role of bias and confounding and how to control for these in selection of study design.
- Appreciate the role of chance/random error, and the appropriate choice and application of statistical testing to assess this.
- Demonstrate the skills and knowledge required for independent or group research.

Content:

Introduction to research: Meaning and objectives of research; definition and Significance of health research, importance of research methodology for health science students.

Scientific research: Definition; Characteristic of scientific research: Purposiveness, Rigor, testability, reliability, validity, replicability, precision, generalizability, objectivity);

Dimensions of scientific research (concepts, theories, deductive & inductive reasoning, empiricism, variables, hypothesis, propositions

Elements of the Scientific Method: Empirical Approach, Observation, Question, Hypotheses, Experiments, Analysis, Conclusion, and Replication

Scientific research process:

Categories of Research: Empirical and theoretical research, Basic and applied, Descriptive vs Analytical Research, Quantitative vs Qualitative Research, Conceptual vs Empirical Research, Etc.

PRO247: Operational Research II, Biostatistics and Health Information System

- **Operational Research II**

Objective: At the completion of this course, students should be able to:

- Understand the concepts of research in the biomedical sciences and be able to apply them
- Be able to accurately describe the fundamental concepts and approaches in qualitative and quantitative research methodology.
- Be able to find and appraise the available research literature through the use of valid resources, and thereby provide informed opinion.
- Be able to raise research questions in professional practice and apply appropriate research methodology to investigate and solve the research questions.
- Write a research proposal for approval by the Ethics Committee.
- Understand the role of bias and confounding and how to control for these in selection of study design.
- Appreciate the role of chance/random error, and the appropriate choice and application of statistical testing to assess this.
- Demonstrate the skills and knowledge required for independent or group research.

Content:

Research strategies and design: **Descriptive study designs**: types of descriptive studies (case report, case series & cross sectional, ecological) and their application, strengths and limitations;

Case seriesExperimental versus observational strategies;

Analytical Observational studies (cross sectional, cohort and case studies);

Analytical interventional studies (Experiments and Quassi experiments: clinical trials

Data collection methods & Techniques/Tools: Types of data in health research, sources of data, qualitative & quantitative methods: interviews (structured, semi-structured, unstructured); Focus groups, surveys, etc.

Questionnaire Design; Definition, types of questionnaires, format, Language and wording style, Sequencing of questions, coding response to questions, length of questionnaire, general lay out; etc.

- **Biostatistics I**

Objectives: To summarize, analyze, present and interpret health statistical information.

Content:

Mathematics

1. Percentages, rates, proportions, simple and compound interest, discount
2. The electronic calculator

Basic Algebra

1. Algebraic expressions
2. Functions
3. Linear and Simultaneous Equations
4. Graphs of Functions
5. Quadratic Equations
6. Arithmetic and Geometric progressions

Biostatistics

1. Introduction
2. Basic concepts in biostatistics
3. Sampling techniques and data collection
4. Variables (Qualitative and Quantitative)
5. Presentation of data: Frequency and frequency distribution, bar charts, Histograms, pie charts etc.
6. Summarization of qualitative and quantitative data: mean, median, standard deviations and standard errors.

- **Health Information System**

Objective: After going through the course, the students should be able to:

- Define the main Concepts and Terminologies used in Health Management Information Systems.
- Describe the various components of a health information system
- Know the different sources and type of data for a health Information system.
- Undertake Health Data Management to provide health information capable of guiding the planners and stakeholders in health care delivery system.
- Understand the foundational basis for the National Health Management Information System Policy

- Describe Project cycle, Monitoring tools and Evaluation of health projects and programs.

Content:

Introduction: Definition of Concepts and Terminologies-data, information, management, health, system, health system, health information, health information system.

Determinants of health: Socio-economic Situations, Demographic Situation, Epidemiological Situation, Health Resources, Human Capital, Health Services, Sectoral Situations: Education, Agriculture, Mineral Resources, Water Resources, Transport, etc.

Components of health information systems: Health information resources, Health Indicators**,** data management, information product, Disease surveillance, monitoring, evaluation.

Health Data Management (Data **management cycle (Data collection, Analyses, Reporting, Dissemination, Data use**): Characteristics of good Data , Types and Sources of Health Data, Methods of Data Collection & some Standard Forms for Health information , Challenges of Health Data Collection, Basics of Data Processing and Analysis (computer –based & paper-based).

National Health Management Information Systems: Challenges and strategies

Monitoring and Evaluation: Programme cycle; Characteristics of Health programme monitoring system (Data collection, Analyses, Reporting, Dissemination. Data use)

PRO351: P & O Workshop Management

Objective: Students would have an understanding of the planning, construction, human management, store management and safety of the workshop.

Content:

Introduction: principle of administrative & management structure, industrial management, definition of organization, type of organizational set up, workshop administration & management.

Man management: introduction, discipline, security, distribution of work, work sheet, time sheet & staff welfare.

Store purchase: Store & Store organization, inventory control, purchase organization, introduction to cost accounting, use of computer for effective Store management.

Safety: industrial accidents, safety & hazards.

Planning: planning of prosthetic & orthotics workshop, all types of various scale, workshop layout, plan layout, costing, billing, documentation especially development of recording system to manage individual records.

Construction: construction, ventilation, electrification, colour scheme, lighting, sanitary convenience, further expansion & accessibility of prosthetic & orthotic workshop & fitting.

Practical: either to design & develop a workshop or to carry out a project for layout of a workshop for prosthetic & orthotics work or workshop of similar nature.

PRO 352 :Mobility & Rehabilitation Aids, Health Care Management

Objective: Students would learn about the use of various types of mobility aids required by PWDs and related analysis of the gait pattern.

Content:

Mobility & walking aids: canes, walking sticks, crutches- axillary, elbow & forearm support, different types of walking frames, walker & their attachment, parapodium & David Hart Walker.

Developmental aids : bio mechanics of different kind of developmental aids , normal mile stone & delayed mile stone , measurement techniques , fabrication of box seat , special chair with or without table / tray , standing / tilting frame , low level cart , prone board & various developmental & educational toys , maximum use of appropriate technology while making developmental aids .

Moulded seats: bio- mechanics, prescription criteria, cast & measurement techniques, cast modification & fabrication of moulded seats with inside or out side posting, use of different materials & technologies to fabricate the same, suspension or right kind of strapping.

Wheel chair : different types , prescription criteria , measurements techniques , wheel chair modification & maintenance according to individual's need , various attachment of the wheel chair , motorized wheel chair , tricycle & motorized tricycle , scooty, different types of cushion & its fabrication techniques .

Gait Training with crutches: training with various walking aides & that to different ways, installation / fabrication of parallel bars & transition from parallel bars to walker then to crutches or sticks.

Self help devices: special gadgets for prehension & to assist in activities of daily living.

PRO353: Biomechanics III

Objective: The understanding of Bio-mechanical principles of Prosthetics and Orthotics will be the foundation of the work of the students. It is essential to have a sound theoretical knowledge of the subject and students are able to demonstrate the rigorous application of these principles to practical P&O situations and in the analysis of those situations.

Content:

Tissue mechanism: study of mechanical characteristics & function of bones, skins, ligaments, cartilage & muscle.

Spinal bio mechanics: motion of the spine , bio mechanics of different region in spinal column , bio mechanics inter vertebral disc , lumbar spine loading , during normal activities & effects of orthoses on this load , bio mechanical principle of spinal orthosis,Bio mechanics of corsets, cervical / thoraco / lumbar / sacral spinal

orthoses. Bio mechanics of scoliosis correction using different technologies & especially using spinal orthoses.

Upper limb : grasp pattern , grasp force , mechanical replacement of hand function , augmentation of deficient hand function , upper limb prosthetic socket bio mechanics –all types , orthoses bio mechanics ,application of external power , myo electric control of external power & usage of devices .

Control systems: introduction to control theory, application in prosthetic & orthotics of functional electrical stimulation (FES), hybrid orthoses, myo electric & bio fed back.

Design concept –I: buckling, theories in failure / fatigue / stress concentration, connection, fluid mechanism & beam deflection.

Design concept –II: shear force & bending moment diagrams, centroids, 2nd moment of area & mass, theorem of parallel axes, bending stress, torsional stress of circular shaft, combine axial &bending stresses. combine & torsional stresses , combine axial bending torsional stresses , open & close helical spring ,beam deflection , design test standards / material / Philadelphia loads/ ISO , design calculation for p&o devices .

Practical: different ways of design test, use of FES & myo electric control systems in P&O devices.

PRO354: Prosthetics Science III

Objective: This subject is delivered in a coordinated manner with the Practical part of the Prosthetic Science course. The student will be required to acquire and comprehend the necessary theoretical knowledge and to be able to integrate this effectively in clinical practice.

Content:

Upper Limb: Grasp patterns, grasp forces, mechanical replacement of hand function, augmentation of deficient hand function, upper limb prosthetic socket biomechanics – all types.

Control systems: Introduction to control theory, application in Prosthetics of functional electrical stimulation (FES), myoelectric and bio-feedback.

Upper limb prosthetics: Historical development in Upper Limb Prostheses – India and abroad, Upper Extremity Prosthetics Components - Terminal devices, Wrist units, Elbow units, Shoulder units, Harnessing systems in Upper extremity prosthesis.

Partial Hand: Both cosmetics and functional types which also includes silicon prostheses. Cosmetic hand gloves and fingers.Devices for augmentation of function and cosmesis for partial hand amputation and finger amputation.

Wrist Disarticulation: Prescription Criteria, Types of prosthesis – Components, Socket Shape, Clinical Considerations, Casting and measurement techniques, Cast modifications, Fabrication techniques, alignment techniques, Harnessing and suspension mechanisms, Fitting, donning and doffing techniques. Check out procedures, Testing and Training.

Trans Radial: Prescription Criteria, Types of Trans Radial prosthesis – Components, Types of Socket which includes Self suspending, flexible/rigid socket or combination of both, Clinical Considerations, Casting and measurement techniques, Cast modifications, Fabrication techniques – single wall and double wall, alignment techniques, Harnessing and suspension mechanisms, Control system – body powered and externally powered, Fitting, donning and doffing techniques. Check out procedures, Testing and Training.

Trans Humerus: Prescription Criteria, Types of Trans Humeral prosthesis which also includes Elbow Disarticulation prostheses – Components, Different types of Elbow Mechanisms. Types of Socket which includes Self suspending, flexible/rigid socket or combination of both, Clinical Considerations, Casting and measurement techniques, Cast modifications, Fabrication techniques – single wall and double wall, alignment techniques, Harnessing and suspension mechanisms, Control system – body powered and externally powered, Fitting, donning and doffing techniques. Check out procedures, Testing and Training.

Shoulder Disarticulation: Prescription Criteria, Types of prosthesis both cosmetics and functional, Components, Different types of Elbow and Shoulder Mechanisms. Types of Socket, Clinical Considerations, Casting and measurement techniques, Cast modifications, Fabrication techniques, alignment techniques, Harnessing and suspension mechanisms, Control system – body powered and externally powered, Fitting, donning and doffing techniques. Check out procedures, Testing and Training.

Prosthetics Practical: Fabrication of prosthesis for partial hand amputation or congenital absence, through wrist prosthesis, Below Elbow prosthesis, Above Elbow prosthesis, Shoulder Disarticulation prosthesis, Elbow Disarticulation prosthesis – preferably using various available technologies.

PRO355: Orthotics Science III

Objective: This subject is delivered in a coordinated manner with the Practical part of the Orthotic course. The student will be required to acquire and comprehend the necessary theoretical knowledge and to be able to integrate this effectively in clinical practice.

Content:

Upper Limb: Orthosis biomechanics, application of external power, myoelectric control of external power and usage of devices.

Control systems: Introduction to control theory, application in Orthotics of functional electrical stimulation (FES), hybrid Orthosis.

Upper Limb Orthotics: Objectives of splinting and principles. Types & classification of Orthoses.Biomechanical principal of all types of upper limb Orthotics. Material used and its advantages and disadvantages. All types of Hand Orthoses, Wrist Hand Orthoses, Elbow Orthoses, and Shoulder Elbow Wrist Hand Orthoses & Pelvic Shoulder Elbow Wrist Hand Orthosis. Measurement/casting and

Fabrication of P.S.E.W.H.O, S.E.W.H.O, Elbow Orthoses, Elbow Wrist and Hand Orthoses, Elbow braces etc.

Immobilization/ mobilization, Appliances for flail elbows: Measurement/casting and Fabrication of Shoulder Orthoses, The shoulder joint braces and splints, Abduction splints and braces, Traction splint of Humerus, All types of Shoulder Elbow Wrist and Hand Orthoses which also includes both body powered and externally powered. All types of fracture Orthoses, Temporary splinting, Feeder and other assistive appliances.

Orthotics Practical: Fabrication of at least 5 types of splints belonging to each group.

PRO356: Clinical Placement V (Rehabilitation center)

PRO357: Medical Law, Legal and Occupational Health and Biostatistics I

- **Medical Law**

Objective: To know the components of medical law.

Content:

- Chapter one: criminal law
- Chapter two: criminal responsibility
- Chapter three: labour law
- Chapter four: some rights of the employee under the labour rule
- Chapter five: civil status registration
- Chapter six: right of women and children under the code
- Chapter seven: tort
- Chapter eight: inheritance, succession and wills
- Chapter night: introduction to human right
- Chapter ten: some international right instruments

- **Biostatistics I**

Content

1. The concept and Principles of Significant tests and confidence intervals
2. Statistical testing and inference: The normal distribution and t-distribution, Chi squared test, Poison distribution, non-parametric tests etc.
3. Errors in statistics.

PRO361: Prosthetics Clinical Practice, Orthotics Clinical Practice

- **Prosthetics Clinical Practice**

Objectives: The student will have experience in the clinical environment of supplying prostheses and orthoses to patients undergoing treatment.

Content:

Direct Service: In this period each trainee will be in touch directly with the persons with disabilities under supervision of the Instructor/Demonstrator. She/he would do all the necessary work from start to the finish for fittings of suitable

prostheses. Each person fitted with prostheses has to be documented/ recorded well and to be presented in the clinics in front of Rehabilitation team and other trainees. Besides fitting, trainee would also work with other rehabilitation team members to understand "Total Rehabilitation".

- **Orthotics Clinical Practice**

Objective: The student will have experience in the clinical environment of supplying prostheses and orthoses to patients undergoing treatment.

Content:

Direct Service: In this period each trainee will be in touch directly with the persons with disabilities under supervision of the Instructor/Demonstrator. She/he would do all the necessary work from start to the finish for fittings of suitable prostheses. Each person fitted with prostheses has to be documented/ recorded well and to be presented in the clinics in front of Rehabilitation team and other trainees. Besides fitting, trainee would also work with other rehabilitation team members to understand "Total Rehabilitation".

PRO362: Health economics

Objective: This course is an introduction to Health Economics.

It is meant to give Health science students basic principles regarding economics and its application to the health sector.

- This course focuses on issues relating to scarcity in the allocation of health resources
- It exposes students to basic theoretical and conceptual frameworks from economics that enable them to analyze the functioning of a health system critically.
- Importantly, they will learn how to apply economic theories of demand, supply, and markets.

Content:

Unit 1. Introduction to Health Economics:

Definition of basic concepts: Health, Healthcare, Economics, Efficiency, Scarcity, Health Economics, opportunity cost, etc

Unit 2. Basic concepts of supply and demand analysis:

Definition of Demand and supply, Demand curve, supply curve, Market Equilibrium Elasticity of demand & supply.

Unit 3Health care market:

General features of the health Care: Perspectives of Health, Distinctive characteristics of the health Care services, Equity and health care, Demand for health care, Supply of health care, Health and Economic Development

Unit 4. Cost Concepts & Economic Evaluation:

Definition of Cost, Types of costs, Types of Economic Evaluation

Unit 5. Health Care Financing & Resource Allocation:

Definition of the health sector Financing, Factors influencing health care Financing, Sources of National Health care financing systems. Barriers to access of heath care.

Unit 6 Resource allocation:

Definition, Reasons for resource allocation in health care, Rationing in health care: Ethics and levels of rationing - Ethical theories: *Utilitarian*, *Deontological*, *Rawlsian*, Implicit and explicit rationing, Efficiency& Equity in resource allocation, Levels of resource allocation:

Unit 7 Macro- allocation (global, National, Allocating resources to healthcare versus other social needs. Allocating resources within the healthcare sector,

Micro: Allocating resources among individual patients.

Factors Complicate Ethical Resource Allocation Decisions

Unit 8 The Role Of Government In Health: Problems of health policy & possible strategies.

- **Approaches to allocation**: Need based analysis, economic evaluation analysis,
- **Other countries' approaches**: Oregon Health Plan
- New Zealand, UK,

PRO363: Computer in Prosthetics and Orthotics

Objective: Student will acquire computer knowledge to design the prosthetics and orthotics components and apply in research and development in prosthetics and orthotics field.

Content:

Introduction to computers and Components of computers: Physical Composition, Central Processing Unit, Main Memory, Input and OuPHut units and also all kinds of common types of computer periPWrals.

Hardware: Various Configurations, Specification of periPWrals and computer system. Various types of storage facilities and its advantages and disadvantages.

Computing environments: Introduction to types of computers- Personal computers, Main frame and super computers, Networks, E-Mail, Internet. Introduction to operating systems, e.g. DOS, Windows, Linux, UNIX, commands and introduction to General file systems.

Software: The current operating software's, Word Processor, spreadsheet, database and presentation software, e.g. Windows XP or Windows 2000 Professional, Microsoft Office XP or 2000 Professional etc., upgraded as used currently, Anti Virus.
Computer Aided Design & Manufacturing (CAD & CAM)

Basics of CAD: Introduction, Definition, History, Current status, Product Cycle, Automation, Designing, Application and Benefits.

Computer Graphics: Introduction of software, Function of graphic package, Application Software.

AutoCad 2010 and updated version: Introduction, Foundation of AutoCad Commands, Execution of Simple 2D Drawings, Understanding 3D commands, Executing3D Commands, Creating 3D objects Rendering and Image attach to an

object Starting New Projects, Creating, Editing, Saving Drawing, Annotation, Dimension, Plotting, Customisation, Auto Lisp.

Introduction to CNC, History of CNC, Advantages and disadvantages of N/C, CNC, DNC, Major part of CNC.

Basics of CAM: Introduction of CNC machine, basics of Computer Aided Designing and Manufacturing (CADCAM) and its use in P&O. Other kinds of Computer use in Prosthetics and Orthotics. CADCAM Technology in socket making and also making of different kinds of orthosis and prosthesis.

CAD/CAM in Prosthetics & Orthotics: types of digitizers used, concept of different types of modifying software, CNC carver and its specification, step wise fabrication procedure of sockets, shells and spinal orthoses, its advantages and disadvantages

Practical: Trainees has to be thorough in all branches of MS Office especially WORD and POWERPOINT. In addition to that it would be better if trainee also learn one additional drawing and imaging software among e.g. Corel Draw, PageMaker, Photoshop or similar kind of softwares.

Trainees has to be thorough in all branches CADCAM especially AUTOCAD. Trainees should make design of all common types of P&O components which are regularly in use by using AutoCAD software.

PRO364: Prosthetics Science IV

Objective: This subject is delivered in a coordinated manner with the Practical part of the Prosthetic Science course. The student will be required to acquire and comprehend the necessary theoretical knowledge and to be able to integrate this effectively in clinical practice.

Content:

Hip Disarticulation Prosthesis: Various types of through hip Prosthesis. Prescription principles, Materials and components to be used, Casting and measurement techniques, Cast modification, alignment, suspension, Fitting, donning and doffing techniques. Check out procedures, Testing and Training. Through hip Gait analysis and deviations.

Prosthetics: Bilateral Stubbies. Bilateral Prosthesis. Trans Lumber Prosthesis (Sitting and Standing), Prosthesis for Child Amputee, Prosthesis for Congenital anomalies, Prosthesis adaptation for sports and recreation, Immediate post surgical fittings, Check-out Procedures.

Practical: Fabrication of Prosthesis for through hip, double or multiple amputees, Fitting of Prosthesis in cases and developing and/or adapting new designs.

PRO365: Orthotics Science IV

Objective: This subject is delivered in a coordinated manner with the Practical part of the Orthotic course. The student will be required to acquire and comprehend

the necessary theoretical knowledge and to be able to integrate this effectively in clinical practice.

Content:

Spinal Biomechanics: Motions of the spine, Biomechanics of different region in spinal column, Biomechanics Inter vertebral disk, Lumbar Spine loading during normal activities and effects of Orthosis on this loads, Biomechanical Principles of spinal orthosis, Biomechanics of Corsets, Cervical/thoraco/lumbar/sacral spinal orthosis. Biomechanics of scoliosis correction using different technologies especially using Spinal orthosis.

Spinal Orthoses: Historical development of spinal orthoses. Anatomical and Physiological Principles of construction and fitting of spinal Orthoses.Biomechanical principle and Functions of spinal Orthoses.

Cervical Orthoses: Principle, material, measurement/ casting, fabrication of all types of Cervical Orthoses especially different types of cervical collar, semi-rigid/rigid cervical orthoses both temporary and permanent. Cervical Traction, HALO traction and various types.

Thoraco Lumbo Sacral Orthoses: Flexible spinal Orthoses. Rigid spinal orthoses. Principle, material, measurement/ casting, fabrication of all types of Thoraco Lumbo sacral orthoses (TLSO) especially all types of orthoses for scoliosis. All types of under arm orthoses and variants. Various types of Immobilisers, Fitting, donning and doffing techniques. Check out procedures, Testing and Training.

Lumbo sacral Orthoses: Principle, material, measurement/ casting, fabrication of all types of Lumbo sacral orthoses (LSO) especially Corsets and all types of orthoses for Lordosis and scoliosis. Pelvic traction and its uses.

Orthotics: Orthoses for sports injury, Reciprocating Gait Orthoses (RGO), Hip Guidance Orthoses (HGO), Fracture Cast Bracing, Swivel walker, orthopodium/ Parapodium. Weight relieving orthoses, Extension orthoses or Ortho-prostheses, PTB.Orthoses, Silicone Cosmetic prosthesis.

Practical: Fabrication of orthoses for children with Cerebral palsy as in para above and adapting according to the individual needs.

PRO366: Clinical Placement V

PRO367: Professional Ethics &Deontology

- **Objective:** At the end of the course, the student should use ethical values in health care decisions, use the civic and legal responsibilities in the execution of daily functions
- **Content:** Professionalism and ethics of health care, responsibility, autonomy, rights of health care consumers, rights of health care providers, the Cameroon legal system, civic responsibilities, the place of the law in health care management, medical jurisprudence, malpractice and negligence. Knowledge on Crimes that may occur at work and how to determine them.

Health care Ethics

1. Morality and Ethics: Norms, Deviances, Religion, Values, Beliefs, Cultures
2. Bioethics
3. MLS Ethics
4. Moral Development
5. Ethical Principles: Autonomy, Freedom, Privacy, Confidentiality, Beneficence, Fidelity, Motivation, Justice, Veracity and Responsibility.
6. Code of Ethics health workers.
7. Application of Ethics to MLS Practice: Respect For Life And Death, The Concept Of Dignity, Euthanasia, Human Rights, Rights of The Child, Rights of The Elderly, Patients Rights
8. Ethical Decision Making Frameworks and their Application in diagnosis
9. Context And Conflicts With Bioethical Standards

Patient Rights:

1. Respect for life and death, the concept of dignity, euthanasia
2. Care for dying patients: Palliative care, Confidentiality, Professional secrecy, Medical Research and Nursing care ethics.
3. Code of ethics.

- **Health** Employee/employer contract law for health practitioner
- MLS and the law

Introduction to Law and Fundamental Rights

Law

- Sources of law
- Law and enabling Acts (text of application)
- The concept of legal personality
- Civil responsibility (contract, TORT)
- Criminal responsibility
- The court and their jurisdictions
- Labor law: formation and execution of labor contract, remuneration, condition of work, obligation of the employer and employee, termination of labor contracts

Fundamental Rights

- The concepts of human rights
- Sources of human right
- Major international conventions of human rights
- International conventions relating to women
- Children and the rights of the minorities
- The role of the judiciary and the legislative in the protection of human rights
- The Cameroon national commission of human rights and liberties
- The civil society NGO's and the protection of human rights

Law for Medical laboratory personnel

- Definition of Law, public law, private law
- The client's and MLS personnel's' constitutional right
- Administrative law related to licensing and regulation of health practice

Field : MEDICAL AND BIOMEDICAL SCIENCES

Specialty :

ULTRASONOGRAPHY

Field:	MEDICAL AND BIOMEDICAL SCIENCES

Specialty:	Ultrasonography

1. The objective of training

This programme aims at training students to gain entry into medical diagnostic ultrasonography as technologists or technicians by enabling them to:

- Develop a range of skills that are necessary to perform routine ultrasound scans in a safe environment.
- Develop skills in recognizing normal and abnormal anatomy and physiology, and pathology from routine obstetrics, abdominal, cardiovascular, paediatrics, musculoskeletal and small parts ultrasound scans.
- Apply the skills developed in 1&2 above together with results from other chemical or physical tests and clinical findings to diagnose patient's conditions or recommend further testing.
- Communicate effectively with patients, their families and other health professionals.
- Facilitate skills of critical reflection, self-evaluation and continuous improvement and professional growth in clinical practice.

2. Research Skills

→ **Generic skills**

- Be responsible and reflective;
- Have gestural skills and interpersonal skills;
- Develop a professional ethic;
- Act with autonomy and responsibility in the well-defined fields of its function;
- Using evidence –based practice in ultrasound diagnosing and treatment;
- Critical mindset in assessing patients scan needs from clinical presentations;
- Effective communication with patients, care givers and other health professionals;
- Confidentiality regarding patients information;
- Good judgement and decision making in patient diagnosing;
- Safety in medical practice;
- Continue personal and professional growth;
- Master the computer tool and ICT.

→ **Specific skills**

- Perform and interpret routine medical ultrasound scans to diagnose common medical disorders diagnosable;

- Monitor the progression of pregnancy and fetal growth and abnormalities;
- Diagnosis of abdominal disorders;
- Carry out and interpret routine ultrasound scans of the breast, prostate, heart, blood vessels, and muscles to detect disorders or diseases of these organs or systems;
- Design and conduct research in the field of ultrasound;
- Training of other people;
- Correlation of medical laboratory test results with ultrasound scans for better diagnosis and interpretation of ultrasound scans;
- Carry out basic X-ray imaging;
- Check the conformity of a sensitive equipment or installation;
- Use ultrasons waves in medicine treatment;
- Check the conformity of a sensitive equipment or installation;
- Control the application of Quality-Safety and Environment procedures.

3. Outlets

- Public Service;
- Private Hospitals and Clinics;
- Private or public centers of paraclinic diagnostic;
- Self-employment;
- Research and training institutions;
- Non-Governmental Organizations (NGOs).

4. Organization of the Teachings

SEMESTER 1

Field: Medical and Biomedical Sciences		**Specialty: Ultrasonography**					
Course Code	**Course Title**	**Number of hours**					**Credit Value**
		L	T	P	SPW	TOTAL	
Fundamental Courses30% (2UC) 9 credits 135 hours							
ULS 111	Human Anatomy and Physiology	50	15	5	5	75	5
ULS 112	Medical Anthropology, Sociology and Psychology/ Foundation of Medical Imaging	50	5	0	5	60	4
Professional Courses60% (4UC) 18 credits 270 hours							
ULS 113	Introduction to Diagnostic Laboratory Medicine/ Ergonomics, General description of devices and technology I	40	5	10	5	60	4
ULS 114	General Microbiology / Medico-Sanitary Techniques and First Aid	40	5	10	5	60	4
ULS 115	Clinical Specimen Collection, Processing and Handling	50	10	10	5	75	5
ULS 116	Clinical Practice I – Specimen Collection, Processing and Basic Laboratory Analysis	0	0	75	0	75	5
Transversal Courses10% (1UC) 3 credits 45 hours							
ULS 117	Bilingual Training I -ICT I	25	10	5	5	45	3
TOTAL		255	50	115	30	450	30

SEMESTER 2

Field: Medical and Biomedical Sciences		**Specialty: Ultrasonography**					
Course Code	**Course Title**	**Number of hours**					**Credit Value**
		L	**T**	**P**	**SPW**	**TOTAL**	
Fundamental Courses30% (2UC) 9 credits 135 hours							
ULS 121	College Algebra and Basic Statistics	40	15	0	5	60	4
ULS 122	Medical Physics and General Chemistry	60	10	0	5	75	5
Professional Courses 60% (4UC) 18 credits 270 hours							
ULS 123	Stool and Urogenital Specimen Analysis	50	5	15	5	75	5
ULS 124	Urine and Body Fluid Analysis	50	5	15	5	75	5
ULS 125	Communication and Counseling in Clinical Setting	35	5	0	5	45	3
ULS 126	Clinical Practice II- Urinalysis, Microscopy, Macroscopy, Serology, Body Fluids and Stool Analysis	0	0	75	0	75	5
Transversal Courses 10% (1UC) 3 credits 45 hours							
ULS 127	Bilingual Training II -ICT II	25	10	5	5	45	3
TOTAL		**260**	**50**	**110**	**30**	**450**	**30**

SEMESTER 3

Field: Medical and Biomedical Sciences		Specialty: Ultrasonography					
Course Code	Course Title	Number of hours					Credit Value
		L	T	P	SPW	TOTAL	
Fundamental Courses30% (2UC) 9 credits 135 hours							
ULS 231	Ultrasound Physics and Instrumentation I / Ultrasound ergonomics, General description of devices and technology II	50	10	10	5	75	5
ULS 232	Essentials of Ultrasound and Patient Care Skills	40	5	10	5	60	4
Professional Courses 60% (4UC) 18 credits 270 hours							
ULS 233	Obstetrics and Gynecological Ultrasonography.	60	5	5	5	75	5
ULS 234	Scanning Techniques and Protocols	45	5	20	5	75	5
ULS 235	Obstetrics and Gynecological Ultrasonography Review.	10	30	0	5	45	3
ULS 236	Clinical Practice III – Obstetrics and Gynecological Ultrasound	0	0	75	0	75	5
Transversal Courses 10% (1UC) 3 credits 45 hours							
ULS 237	Initiation to research	25	5	10	5	45	3
TOTAL		**230**	**60**	**130**	**30**	**450**	**30**

SEMESTER 4

Field: Medical and Biomedical Sciences		Specialty: Ultrasonography					
Course Code	Course Title	Number of hours					Credit Value
		L	T	P	SPW	Total	
Fundamental Courses30% (2UC) 9 credits 135 hours							
ULS 241	Quality control in conventional ultrasounds techniques (ISO 9001), Environmental management system (ISO 1401) and the patient protection	60	5	5	5	75	5
ULS 242	Sectional Anatomy- Abdominal and Pelvic	40	5	10	5	60	4
Professional Courses 60% (4UC) 18 credits 270 hours							
ULS 243	Abdomino-pelvic ultrasonography	60	5	5	5	75	5
ULS 244	Abdomino-pelvicUltrasonography Review	20	30	5	5	60	4
ULS 245	Ultrasound Physics and Instrumentation Review	20	30	5	5	60	4
ULS 246	Clinical Practice IV- Abdomino-pelvic Ultrasound	0	0	75	0	75	5
Transversal Courses 10% (1UC) 3 credits 45 hours							
ULS 247	Mecical Law and entrepreneurship in health	20	5	15	5	45	3
TOTAL		**20**	**80**	**120**	**30**	**450**	**30**

SEMESTER 5

Field: Medical and Biomedical Sciences		**Specialty: Ultrasonography**					
Course Code	Course Title	Number of hours					Credit Value
		L	T	P	SPW	TOTAL	
Fundamental Courses30% (2UC) 9 credits 135 hours							
ULS351	Public Health and Epidemiology/Politics and Health Management System	50	5	0	5	60	4
ULS352	Ultrasound Physic and Instrumentation II	50	10	10	5	75	5
Professional Courses 60% (4UC) 18 credits 270 hours							
ULS353	Basic Echocardiography	50	5	15	5	75	5
ULS354	Introduction to Conventional X-ray	40	5	10	5	60	4
ULS355	Basic Electrocardiography	40	5	10	5	60	4
ULS356	Clinical Practice V- Echocardiography and Basic X-ray	0	0	75	0	75	5
Transversal Courses 10% (1UC) 3 credits 45 hours							
ULS357	Medical law and legal issues	30	5	5	5	45	3
TOTAL		**260**	**35**	**125**	**30**	**450**	**30**

SEMESTER 6

Field: Medical and Biomedical Sciences		**Specialty: Ultrasonography**					
Course Code	**Course Title**	**Number of hours**					**Credit Value**
		L	**T**	**P**	**SPW**	**TOTAL**	
Fundamental Courses30% (2UC) 9 credits 135 hours							
ULS 361	Introduction to Ultrasound guided Techniques / Structure, Function and Maintenance of Equipments	40	5	10	5	60	4
ULS 362	Introduction to Pediatric Ultrasound	50	10	10	5	75	5
Professional Courses 60% (4UC) 18 credits 270 hours							
ULS 363	Introduction to Musculoskeletal Ultrasound	40	5	10	5	60	4
ULS 364	Basic Vascular Ultrasound	40	5	10	5	60	4
ULS 365	Basic Ultrasound of Small Parts	50	10	10	5	75	5
ULS 366	Clinical Practice VI- Small Parts, Vascular and Musculoskeletal Ultrasound/ Research project (Project Defense)	0	0	75	0	75	5
Transversal Courses 10% (1UC) 3 credits 45 hours							
ULS 367	Projet Writing	25	5	10	5	30	3
TOTAL		**245**	**40**	**125**	**30**	**450**	**30**

5. Courses content

ULS 111: Human Anatomy and Physiology

Objective: This course is an introduction to anatomy and physiology and assures no prior knowledge of the human body by student. It is directed to prepare students for health-related professions such Ultrasonography, Medical Laboratory Technology etc.

Content:

- Introduction to Human Anatomy and Physiology
- Life Processes and Homeostasis:
- The Chemical Level of Organization
- cellular level of organization:
- Tissue level of Organisation
- Major systems of the human body:
- Digestive System
- Respiratory System
- Control Systems of the Human Body:
- Special Senses
- Reproductive System:
- The Endocrine System:
- Support and Movement:
- Integument System:
- Circulatory & Cardiovascular System
- Lymphatic System and Immunity
- The Renal System
- Fluid, Electrolyte and Acid-Base Homeostasis

ULS 112: Medical Anthropology Sociology and Psychology

Objective: This course is designed to introduce the students into the field of general and social psychology. Psychoanalytic, learning, cognitive, and sociocultural theories will be discussed in relation to the developing person throughout the lifespan.

Content:Sociology and Psychology

A. The concept of psychology, Definition, behaviour and the focus of psychology, The changing pattern of psychology, Becoming a distinct person
B. Human needs (Maslow's hierarchy of needs), individual differences, socialization, self-image, Human interaction, Human emotion/ experience of emotion
C. Definition/origin of social psychology/ Theories; what theories do,Psychoanalytic theory (Freud's ideas, Erickson's ideas/Evaluation of Psychoanalytic theory)

D. The learning theory: Laws of Behavior (classical conditioning, operant conditioning), social learning theory, cognitive theory; Piaget's theory, Information-processing theory
E. Sociocultural theory; Vygotsky's theory, evaluation of the sociocultural theory. Comparison of Theories.
F. Personality and Personality type, hereditary forces, Development of talent and attitude, Personality trait, effect people have on others. Genetic Counseling.
G. Organizations and groups, Social influence, Interpersonal perception/ impression formation, Social relationships, the development, maintenance, growth and decline of relationship, Justice in social relationships
H. Communication process: Body contact, Proximity, Orientation, Odour, Posture, Headache, Facial Expressions. Gesture, Looking, Power, Authority and Leadership in a group, Determination of power, Authority.
I. Social attitudes, formation, Measurement and change in attitude
J. The first two years; Biosocial development; Cognitive and psychosocial development
K. The play years: biosocial development, cognitive development, psychosocial development
L. The school years: biosocial development, cognitive development, psychosocial development.
M. Adolescence: biosocial development, cognitive development, and psychosocial development
N. Early adulthood: biosocial development, cognitive development, and psychosocial development
O. Middle adulthood: biosocial development, cognitive development, and psychosocial development
P. Late adulthood: biosocial development, cognitive development, and psychosocial development

Content: Medical Anthropology

A. Introduction/Definition of terms/social institution (family), The field of medical Anthropology, The origin and theories of medical Anthropology
B. Relevance of behaviour science to the health care delivery system in Tropical Africa
C. Forms of control and legitimacy
D. The fabric of health and major concepts (health, diseases and sickness)
E. Theoretical perspective of the field of Medicine (ecological, functional etc.), Theoretical models of illness causation, Systems of health beliefs and practices (scientific and non-scientific medicine)
F. The concept of disease in Tropical Africa (view /perception of diseases),
G. Social Epidemiology (behaviour/characteristic that put people at risk of diseases), Epidemiology study design
H. System of health care delivery (traditional/modern, diagnostic procedures/forms of treatment)

I. Relationship between traditional and Biomedical clinicians, The role/status of medical practitioners and traditional healers in Africa, Advantages/disadvantages of traditional healers
J. Applying Anthropology clinically, Power and organization in medicine

- **Foundation of Medical Imaging**

General Objective: The purpose of this course is to introduce students to the various medical imaging techniques.

Content:

a) Diagnostic Medical Ultrasound

- Nature and Brief history of Ultrasound
- pioneers that shaped the technology
- principle of ultrasound
- Applications of Ultrasound (clinical)
- Advantages and disadvantages of ultrasound technology

b) Radiography technology

- History of the different radiographic techniques and the pioneers that shaped the techniques
- X-ray, Characteristics of x-rays, units of measurement
- Radiographic terminologies used in the different techniques
- principle of the different techniques
- Applications of the radiographic techniques (clinical)
- Advantages and disadvantages of the different radiographic techniques

c) Magnetic resonance imaging

- Historical development and pioneers that shape the technology
- Basic Physics and principle of MRI
- Basic terminology of MRI
- Advantages and disadvantages of MRI
- Applications of MRI (clinical)

d) PET imaging

- Historical development and pioneers that shape the technology
- Basic terminology of PET
- Applications of PET (clinical)
- Fundamental principles and physics of PET imaging
- Advantages and disadvantages of PET

ULS 113: Introduction to Diagnostic Laboratory Medicine

Objective: This course is aimed at giving an understanding of the basic organization of the laboratory unit of the health sector, the major equipment, their uses and preventive maintenance of this equipment in the laboratory. It is equally designed to demonstrate basic management concepts required for a manual laboratory.

Content:

- **General Introduction**
  - Hospital organization/Environment
  - Interdisciplinary approach to medical practice
  - Evidence based medicine
  - Medical Process
- **Laboratory organization**
  - Introduction to lab organization
  - Structure of a medical laboratory service
  - Classification of medical Labs and functions
- Laboratory Services
  - Role of medical Lab service
  - Role of medical Lab technologist
  - Lab rules, ethics and professional issues
  - Lab policies
  - The major outcomes of good laboratory practice.
- Units of measurements in clinical laboratory
  - Interconversion between different units
- Solutions use in medical labs and preparations
  - Expressing concentration of solutions in medical lab
  - Preparation of dilutions and concentrations
  - Guidelines for Preparation of Stains, Solutions and Chemical Reagents.
- Lab Instrumentation and maintenance
  - Centrifuge, functions and care
  - Balances, functions and care
  - Refrigerators/Freezers, functions and care
  - Water bath/Heat blocks, functions and care
  - Ovens, functions and care
  - Incubators, functions and care
  - Autoclaves, functions and care
  - Micropipettes, functions and care
  - Mixers/Vortexers, functions and care
  - Spectrophotometers/colorimeters, functions and care
  - Desiccators, functions and care
  - PH meters, functions and care etc.
- Instruments for water purification
- Microscopes, functions and care.
- Automated analysers, functions and care.
- Glass/Plastic wares, functions and care.
- Sterilization and disinfection
- Disinfection and decontamination of Lab wastes (autoclaving pasteurization, boiling, use of chemical disinfectants)
- Instruments, materials and method of preparing Lab water

Uses of deionized water

- Lab accidents and safety with regards to OSHA
- Lab hazards and accidents including Microbial hazards, Chemical and reagent hazards ,Equipment and glassware hazards
  - Types of lab accidents and preventive methods
  - Factors contributing to Lab hazards
  - First aid for Lab hazards/accidents
  - Risk assessment and management in a medical Lab
  - Safe use and storage of chemical reagents
  - Planning for Lab general work safety, Chemical Safety, Environmental safety, Biological safety cabinets and bio-safety levels, Radiation safety Laser safety.
  - General precautions for the avoidance of Lab accidents

✓ Processing of infectious material and re-use of non-disposable equipment in the laboratory; specimen, haematocrit tubes, swabs, cultures, slides, cover glasses, lancets, syringes, needles, pipettes, tubes, gloves, glass and plastic wares, disposable waste.

- Methods of lab wastes (sharps, biological etc.) disposal (incineration, burial in a deep pit/land field)

✓ Introduction to QA in Lab Medicine

- Types and causes of errors in medical Labs
- Preventive strategies of Lab errors

✓ Introduction to Medical Lab analytical methods

✓ Different types of Medical Lab analytical methods

ULS 114: General Microbiology

Objective: This course is to aid the students to learn the basic microbiological concepts that apply to allied health professionals.

Content:

A. **Introduction**: Scope of Microbiology, Historical milestones of Microbiology

B. **Cell Structure and Taxonomy:** Characterisation, classification and identification of microorganisms

C. **Diversity of Microorganisms:**

- Microscopic observation of microbes and microbiological staining methods, Bacterial characteristics.
- Rudimentary bacterial forms – Rickettsias and chlamydias, mycoplamas, fungal characteristics and disease, Algae and protozoa, acellular infectious agents.

D. **Microbial Physiology and Genetics**

- Growth and reproduction of microbes, Bacterial cultivation and quantitative measurements of growth

- Pure cultures and growth characteristics, Changes in Bacterial genetic constitution
- Microbial growth control methods:Physical methods, Chemical methods
- Antibiotics, Antibiotic susceptibility testing

E. Microbial Pathogenicity and Epidemiology

- Pathogenicity of microorganisms, Disease process
- Virulence and virulence factors
- Epidemiology and disease transmission, Control of epidemic diseases

F. Body Defence Mechanisms against Infection

- Non-specific defence mechanisms against infection
- Immune responses: Antigens and antibodies, Mechanisms of antibody formation and structure, Humoral- Mediated Immunity, Cell-mediated immunity, Hypersensitivity

G. Infections of the Body Systems and Their Control

- Skin infections: Bacterial, viral, fungal, burns and wounds, Eye, Ear and Mouth infections
- Respiratory tract infections, Gastrointestinal tract infections, Genito-urinary tract infections
- Circulatory system infections
- Central nervous system infections, Hospital infection control

H. Surveillance and Epidemiology

- Nosocomial Infections
- Surveillance, purpose and benefits
- Establishing a surveillance system; comprehensive surveillance, Selective, Source of information
- Other important diseases: Epidemiology and Prevalence, Epidemic investigations and control. Food water and Air-borne infections of man, Contact diseases of man.

➢ **Medico-Sanitary Techniques and First Aid**

Objective:

Content:

- General introduction
- Patient reception, records and patient room
- Clerking (history taking)
- Preparation of the room, patient's bed: description, types of beds, bed making
- Personal hygiene, prevention of bed sores, position in bed, care of the bed
- Taking of vital signs
- Definition and objectives
- Microorganisms and infection.
- Notions of general Epidemiology

- Field notions: resistance, receptivity
- Personal hygiene
- Nutrition
- Environmental hygiene.
- Hospital hygiene.
- Nosocomial infections and infection control
- Nursing hygiene.

ULS 115: Clinical Specimen Collection, Processing and Handling

Objective: This course is designed to teach students the role of the laboratory in proper specimen collection and handling of specimens, standard protocols for collection, handling and processing of specimens for transport or receipt in to or from the laboratory.

Content:

A. Role of the Laboratory in Proper Specimen Collection

- Preparation of the patient; legal implications related to specimen collection, ethical complications, safety measures, infection control and standard precautions
- Storage and transportation of specimen, immediate specimen transport, transport from non-acute settings to the laboratory, transport to special laboratories

B. Standard Protocols for Collection, Transport and Processing Of Specimens

- Collection and transport of blood specimens (Capillary blood, Venous blood, Arterial puncture for Arterial blood), types of blood collection tubes and their uses, different types of anticoagulants and preservatives for blood collection.
- Collection and transport of urine (random urine specimens, second-voided specimens, first morning and fasting samples, clean catch midstream urine, catheters, Timed (24hr) urine specimen, pediatric and supra pubic aspiration)
- Collection and transport of microbiologic specimens (faecal, Respiratory tract , Pus, ulcer and skin specimens,Effusions, CSF and seminal fluid, Urogenital specimens, cervical specimens from females, hair and nail specimens,Eye. Post mortem specimen collection, post mortem skin biopsy, post mortem skin biopsy for diagnosis of pathogens with high infectious risk e.g. viral hemorrhagic fever (materials, method, handling and transportation)
- Collection, handling, transport and Storage of anatopathology specimens

C. Specimen handling and processing; general rules for handling specimens, specimen receipt and preliminary observations, labeling of specimens, criteria for specimen rejection, microscopic examination of direct mounts for presumptive diagnoses where applicable.

D. Precautions for Packaging and Mailing of Specimens

ULS 116: Clinical Practice I

Objective: The purpose of this course is to introduce students' to clinical settings and training in the domain of Sample Collection, Processing and Handling

Content

- Demonstrate and explain universal precautions in handling bio-hazardous materials.
- Apply the established procedures for obtaining blood by venipuncture or capillary puncture.
- Apply the established procedures for obtaining or receiving specimens
- Apply the established procedures for receiving and registering patients
- Differentiate between appropriate specimens for processing and those that should be rejected, including reason for the choice.
- Using reference laboratory procedure manuals, process specimens for transport.

ULS 117: Bilingual Training I -ICT I

- **French : 1.5 credits (22 hours 30mn)**

1. Vocabulaire

- Vocabulaire technique usuel

2. Grammaire

- **Du verbe** : Conjugaison aux temps communément utilisés – présent, passé composé ; imparfait, futur, conditionnel, et plus-que-parfait, l'impératif, l'infinitif, voix passive ;
- **De l'adjectif** : Qualificatif, possessifs, démonstratifs, interrogatifs, numéraux, indéfinis ;
- **Du nom et son article**: masculin/féminin ; singulier/pluriel ; dénombrable, et non-dénombrable ;
- **Du pronom** : personnel, possessif, interrogatif, démonstratif, relatif, indéfini ;
- De l'adverbe et de la locution adverbiale : pour dire comment, où, quand et pourquoi ;
- Des fonctions grammaticales.

3. Expression et communication

- Compréhension et interaction au cours d'une discussion technique ;
- Communication orale courante ;
- Communication orale interactive
- **De la phrase** : simple, complexe, composée ; interrogative, déclarative, exclamative et impérative ;
- Lecture rapide et compréhension de texte ;
- synthèse d'un long texte

- **De la communication** : rédaction de texte, d'instructions, de rapport, d'une correspondance –d'une lettre recommandation ou de motivation, d'une, demande d'emploi, d'une demande d'explication, d'une réponse à une demande d'explication, d'un CV ;
- **Gestion d'une table ronde/discussion** : La prise de notes, la prise de parole
- Expressions figées.

4. Information and Communication Technology: 1 credit (15 hours);L, T, SPW

1. Computer Equipment (Hardware)
2. Computer software (software)
3. Study of a operating system (Windows 7)
4. Learning of a software application (Microsoft Word)

ULS 121: College Algebra and Basic Statistics

Objective: To make students to be able to apply the four fundamental operations (addition, subtraction, multiplication and division) and other operations like factoring, simplifying, graphing and substituting to solve problems involving some concepts in algebra.

Content:

PART A: College Algebra

A. Some Basic Concepts

- Fundamental operations in algebra
- Algebraic equations
- Factors
- Axioms of equality
- Use of Parentheses
- Algebraic expression and its evaluation
- Monomial, multinomial and exponents

B. The Number system

- Natural numbers, negative and positive numbers.
- Rational and irrational numbers
- Number line (number scale)
- Rules for the fundamental operation

C. Monomials and polynomials

- Polynomials
- Grouping symbols
- Fundamental operations on polynomials
- Rules for exponents

D. Special Products and Factoring

- Definition of factoring
- Multiplying two binomials
- Factoring a trinomial and polynomial.
- Squaring a binomial
- Factoring a difference of two squares.

E. Fractions

- Arithmetic and Algebraic fractions.
- Equivalent fractions.
- Reducing fractions.
- Fundamental operations on fractions
- Finding the LCD
- Mixed numbers
- Changing complex fractions into simple fractions.

F. Exponents, Roots and Radicals

- More rules of exponents
- Square root of a fraction
- Fractional exponent
- Rational and irrational numbers
- Simplifying radicals
- Fundamental operations on radicals

G. Linear and Fractional Equations and Formulas

- An equation and types of equations
- Axioms of equality
- Solving equations
- Finding LCD for fractional equations having binomial denominators
- Formula – solving problems using a formula

H. Functions and Graphs

- Rectangular coordinate system
- Linear equations, solving and graph plotting

I. Quadratic equations

- Definition and types of Quadratic equations.
- Solving quadratic equations by factoring
- Transforming a quadratic equation into standard form
- Solving quadratic equations by completing squares
- Solving quadratic equations using the quadratic formula
- Solving quadratic equations by graphing.

J. Inequalities

- Definition and types of inequalities
- Operations involving inequalities

K. Ratio, Proportion, and Variation

- Ratios, and proportion
- Types of proportion

- Variation; types and solving variation problems

SECTION B: **Biostatistics&Epidemiology**

A. BIOSTATISTICS

- Frequency distributions
- Measureofcentraltendency
- Measures of dispersion (variation, spread)
- Probabilitydistribution
- Sampling
- Hypothesis testing and statistical significance
- Test of significance

B. EPIDEMIOLOGY

- Crude rates
- Adjusted rate
- Specific rates
- Principles if study design
- Measures of effect
- Association and causation
- Diagnostic tests and screening
- Disease prevention
- Other terminology

ULS 122: Medical Physics and General chemistry

Objective: This course aims in providing a sound basic knowledge and understanding of the Wave theory, Radioactivity, the Electromagnetic spectrum and their applications in health care deliveryand also basic concepts and principles in chemistry that are useful in medical sciences.

Content:Medical Physics

A. Basics principles of Mechanics and Rotational dynamics, Clinical application of rotational dynamics
B. Fundamentals of Pressure and its measurement, Clinical applications of pressure.
C. Fundamentals of Electricity, Clinical applications of principles of electricity
D. Basic principles of Magnetism, Applications of magnetism in medical imaging and diagnosis
E. Wave Optics: Lenses, mirrors, prisms and gratings, Clinical application of optics
F. Basic concepts of Sound , Ultrasound and its applications in clinical practice
G. Basic concepts heat and heat energy, Clinical applications of heating
H. The Electromagnetic (EM) spectrum, Clinical applications of the EM spectrum, UV-radiations
I. Fundamentals of Radioactivity, Clinical application of radioactivity, Background radiation and Radiation protection
J. Introduction to health Physics and dosimetry, Introduction to Medical computing and Mathematics.

Content: General chemistry

Part 1: Basic Chemistry

- Introduction to Chemistry, The Discovery Process, The Science of Chemistry
- Measurements in Chemistry, Matter and its characteristics, Data, results, units, Measuring matter, Unit conversion, Error, accuracy, Precision, and uncertainty
- Significant figures, and significant notation, Significant figures in calculation of results, Mathematical operations involving exponential notation, Temperature measurements, Energy measurements. Report data and results using scientific notation and proper number of significant figures.
- Concentration, Density and specific, Measuring devices, Learn the major units of measure in English and metric systems, and be able to concert from one system to another and within the same system.
- Compare and contrast the terms error, accuracy, precision, and uncertainty
- Matter and Energy, Physical states of matter, Composition, Properties of matter, Properties and changes of pure substances
- Atomic Structure, Atomic mass, Dalton's atomic theory, General arrangements of subatomic particles. Atomic number isotopes, Electron- dot formulas of element
- Periodic Classification of Elements: The periodic law, the periodic table, Periods and groups, General characteristics of some groups
- The Structure Of Compound: Chemical bonds, Ionization Energy and Electron affinity. Using the periodic table to predict oxidation numbers, properties formulas and types of bonding in compounds
- Chemical Nomenclature of Inorganic Compounds: System chemical names, Binary compounds containing a metal and a non- metal
- Acids, bases and salts, Common Names, Guidelines for balancing chemical equations, Types of chemical equations
- Liquid and Water: The liquid state, Condensation and evaporation, Distillation. Physical properties of water, Structures of water and polarity, Hydrogen bonding in water, Reactions of water, Hydrogen peroxide
- Solutions: Types of solutions factors, affecting solubility and rate of solution, Saturation, unsaturation and supersaturate solutions, Concentration of solutions, Molality, Normality, Molarity
- Acids, Basis (and ionic equations): Properties and definition of acids and bases, Strengths of acids and bases, Ion formation in aqueous solutions, pH, and pOH, Solutions of electrolytes and non – electrolytes
- Reaction Rates and Chemical equilibrium: Reaction rates, Reversibility of reactions and chemical equilibrium, Le Châtelier's principle, Weak electrolyte equilibria, Buffer solution equilibria

Part 2: Organic Chemistry

- Organic chemistry: Shapes and structures of organic molecules, Alkanes, Alkenes, Alkynes, Aromatic Hydrocarbons, Hydocarbon derivatives – alcohol/ ethers, aldehydes and ketones/ carboxylic acids/ esters/ amides/ amines

Part 3: Nuclear Chemistry

- Radioactivity: Natural radioactivity, artificial radioactivity, Half-life measurement of radio activity, Uses of radioactive isotopes.

ULS 123: Stool and Urogenital Specimen Analysis

Objective: This course aims at describing the different methods used for analyzing stool and urogenital samples for identification and quantification of parasites that can be observed in them.

Content:

A. Quality control of parasitological tests
- Specimen/request form, quality control (pre-analytical, analytical and post-analytical stages), controlling stains and reagents for analysis, slides/cover glasses, microscopy and centrifugation.
- Collection and transport of stool samples, preservation of parasites and permanent mounts; preservation and fixation of faecal parasites and preservation of worms

B. Classification of medically important parasites that can be found in stool; amoebae, flagellates, ciliates, coccidian, microsporidia, flukes, tapeworms, nematodes

C. Mode of transmission of the above parasites; parasitic and host factors, parasites associated with HIV.

D. Examination of Feces
- Reasons for examination of specimens, collection and processing of faecal specimens for parasitic examination such as dysenteric stools etc.
- Direct examination of faeces for parasites; reporting appearance of stool, microscopic examination of faecal specimen, identification of larvae, helminthes eggs, intestinal flagellates, ciliates, cyst and oocyst, faecal leucocytes, other non-parasitic structures found in faeces.
- Concentration techniques for stool analysis (sedimentation and floatation); formol ether concentration techniques (principle, requirements, methodology and microscopic examination of preparation. Zinc sulphate floatation technique, saturated sodium chloride floatation technique, Stoll's technique (principle, requirements, methodology, and microscopic examination of preparation)
- Examination of stool specimen for:

- *E histolytica*trophozoites, cyst of *E dispar/E. histolytica*, staining of chromatoid bodies, other non-pathogenic cyst that can be observed in stool.
- *Blastocystishominis, Glamblia* (trophozoite, cyst), *Balantidium coli* (trophozoite, cyst)
- Laboratory diagnosis of *Isospora belli, Cryptosporidium parvum*, *Microsporidia*, identification of helminthes eggs and larvae in faeces (*Ascarislumbricoides, Trichiuristrichiura, Necatoramericanus, A duodenalis, S stecoralis* (direct and concentration techniques)

- Intestinal schistosomal species; examination of feces for schistosomal egg, direct and semi quantitative techniques (Kato Katz, formol detergent field technique for concentrating and quantifying schistosome eggs) and interpretation of egg count.
- Examination of feces for *C sinensis* eggs, examination of duodenal fluid, for *C sinensis* egg, laboratory diagnosis of facioliasis, *Heterophyesheterophyes, M yokogawai, Dicrocoelumdendriticum*, laboratory diagnosis of *Taeniasaginata, Taeniasolium*.
- Examination of feces for *D latum, Hymenolepis nana*, and examination of perianal specimens for pinworm (*Enterobiusvermicularis*eggs.
- Laboratory diagnosis of toxocariases, filariasis, onchocerciasis and loaisis.
- Laboratory diagnosis of liver, lung trematodes, and cestodes (*Taeniasolium, Taeniasaginata, Diphyllobotriunlatum and Echinoccocusgranulosus*)

E. Microscopic examination of urogenital specimens;
- Preparation and staining of smear for patients with suspected bacterial vaginitis, candidiasis, puerperal sepsis, septic abortion.
- Possible pathogens that can be isolated from urethral swabs, cervical swabs and vaginal swabs, possible pathogens that can be isolated from genital ulcer specimens, and commensals in urethral, vaginal and cervical swabs.
- Collection and transportation of cervical, urethral and vaginal swabs; collection of urethral discharge from male patients, collection of cervical discharge from female patients, cervical smear for malignancy.

F. Culture and identification of intestinal parasites (types of media used, inoculation and incubation of media for different organisms).
- Isolation and identification of intestinal parasites (cultural, serological and biochemical identification)

G. Culture and identification of urogenital parasites (types of media used, inoculation and incubation of media for different organisms).
- Isolation and identification of urogenital parasites (cultural, serological and biochemical identification) of intestinal parasites.

ULS 124: Urine and Body Fluid Analysis

Objective: The aim of this course is to provide basic knowledge on the composition of urine and other body fluids, their deviations from normal that can occur with these fluids and how they can be analyzed macroscopically and microscopically in the laboratory to assist in diagnosis as a means of confirming or evaluating an abnormal physiochemical finding which is clinically useful.

Content:

A. URINE (microscopy and urinalysis)
- Formation of urine, Collection and processing of specimen (method, preservation of urine for suspected disease conditions, timing, handling and

transportation), Quality assurance/instrumentation in urinalysis (Equipment/systems, request forms, standard quality control procedures)

- **Macroscopic examination of urine**:Physical characteristics; Colour/odour (pathogenic and non-pathogenic substances that colour urine), Appearance, Specific gravity (urinometer, refractometer and reagent strips)
- Chemical examination, Glycosuria/Reducing substances (glucose oxidase test, clinitest tablets, benedicts qualitative test), Proteinuria (reagent test strips method, sulfosalicylic acid screening test, heat and acetic acid test) Bence-Jones proteins (heat precipitation, toluene sulfuric acid test), Urinary pH**,** Occult blood/hematuria/hemoglobinuria/myoglobinuria (Reagent strips,Hematest, Ammonium sulphate test),Ketones (Reagent strips, Harts test), Bilirubin (reagent strips, ICTOTEST, Foam test, Smith Iodine test, Harrison spot test)**,** Urobilinogen (reagent strips, Ehrlich'S qualitative test), Nitrite (N-Multistix, Chemistrip 8) Leucocyturia, Ascorbic acid
- **Microscopic urinalysis:** Normal urinary sediment; Preparation of sediment and use of microscope (methodology and examination), Blood cells (erythrocytes, Leukocytes), Epithelial cells (renal tubular, transitional and squamous)**,**Crystals and significance (Acid urine, Alkaline urine), Spermatozoa, Mucus threads in urine.Urinary cast (Hyaline,WBC, RBC, and others), Microorganisms (bacteria, Yeast), Cylindroids, Fats and oil droplets, Contaminants and artifacts) and their significance in urine**,** Abnormal urinary sediment; Blood cells, Epithelial cells, Abnormal crystal, Artifacts in urine**,** Abnormal casts, Parasites in urine (*Trichomonasvaginalis*, *Enterobiusvermicularis, Schistosomahaematobium)*
- Preparation and examination of wet mounts of urine, Preparation and examination of gram-stained smear of urine, Testing urine for HCG, Urine culture media, Technique for culture, Estimating, reporting and interpreting bacterial number/count in urine
- Metabolic Diseases diagnosed by urinalysis: Marple Syrup Urine Disease (Description, Signs and Symptoms, Diagnosis, Treatment)

B. BODY FLUID ANALYSIS

- Types and origin of body fluids and effusions; causes of effusions and possible pathogen in effusions
- Body fluid compartments, composition of body fluids, factors affecting water/solute movements between vessels and tissues, concentration of body fluids
- Examination of effusions; appearance of specimens, examination of fluids for cells, estimation of protein in the fluid preparation and examination of gram smear of effusions, preparation and examination of Zhiel Nelson stained smear of effusions. Wet mount preparation in suspected gout specimens for crystals, cytology smears for suspected malignancy samples,

- Analysis of CSF; Analysis of Synovial fluid Analysis of Joint FluidsAmniotic fluid, Analysis of Ascitic/Peritoneal Fluid, seminal fluid

ULS 125: Communication and Counseling in Clinical Setting

Objective: The aim of this course is to explore the nature of human communication and the role of the lab technologist in maintaining effective communication.

Content:

- Overview of the Importance of Communication
- Levels of Communication in the Communication Process
- Verbal/Nonverbal/Written Communication
- Making Communication Effective/Principles of Effective Communication
- Communication Theories
- Developing and Using a Professional Language
- Counseling in clinical practice
- Application of communication and counselling in Clinical setting

ULS 126: Clinical Practice II

Objective: The purpose of this course is to introduce students' to clinical settings and training in the domain of urine and body fluid analysis and in the domain of Stool and Urogenital Fluid Analysis.

Content

1. **Automated Urinalysis.**
   - Perform the analysis of patient urine specimens using the automated system.
   - Perform or verify calibration or standardization of the instrument.
   - Recognize instrument problems and warnings and perform procedures to correct these problems.
   - Following instructor demonstration and using the instrument manual and maintenance manual. Perform, with minimal supervision, maintenance and troubleshooting procedures assigned by the instructor.
   - Following instructor demonstration and using the procedure manual, perform without direct assistance, urine sample preparation prior to testing.
2. **Physical and Chemical Urine Testing.**
   - Following instructor demonstration and using the procedure manual, perform without direct assistance, urine sample preparation prior to testing.
   - Using the procedure manual, perform without direct assistance assessment of physical characteristics of urine.
   - Using the procedure manual, perform without direct assistance, reducing substance testing of urine.
3. **Microscopic Urine Exam**

- Using the procedure manual, perform without direct assistance, urine sample preparation prior to microscopic examination.
- Using the procedure manual, perform with minimal supervision, proper adjustment of the microscope to be used for microscopic exam.
- Using the procedure manual, perform with minimal supervision, routine microscopic urine exam.

4. Urine Pregnancy Test.

- Using the procedure manual, perform without direct assistance, urine sample preparation prior to pregnancy testing.
- Using the procedure manual, and following instructor demonstration, perform with minimal supervision, pregnancy testing of urine.

5. Specimen Collection:

- Apply the established procedures for obtaining or receiving specimens, including examination of requisitions and logging in of specimens.
- Differentiate between appropriate specimens for processing and those that should be rejected, including reasons for the choice.
- Identify and integrate reasons for choice of the appropriate media, atmospheric conditions, temperature and demonstrate the proper and inoculation techniques for isolation of micro-organism.

6. Macroscopy

- The colour of the stool
- The appearances of the stool
- Using the procedure manual, perform the minimal supervision, after observation.

7. Microscopy

- Following instructors demonstrate and using the procedure manual, perform microscopic analysis.
- Should be able to manipulate the microscope.
- To be able to identify eggs, cysts and trophoziotes and distinguish them
- Should be able to distinguish helminthes from protozoa.
- Should be able to perform feacal occult test and interpret results with minimal supervision.

ULS 127: Bilingual Training II and ICT II

- **English: 2 credits (30 hours)**

1. Vocabulary

- Technical and usual vocabulary of the specialty

2. Grammar

3. Bilingual expression

- Understanding in interaction in Technical Discussions
- Continuous oral communication: Show, explain, develop, summarize, account, comment;
- Interactions oral communication

4. Autonomous reading of "writings" of all levels

- Lead by a quick reading to understand the general sense;
- Browse a text long enough to locate desired information;
- Gather information from different parts of the document or of the different documents in order to accomplish a specific task.

5. Write clear, detailed texts

- Essay writing;
- Application for employment;
- C.V.;
- Letter of motivation;
- Letter/memo writing and minutes of a meeting.

➢ **Information and Communication Technology: 1 credit (15 hours);L, T, SPW**

1. Computer Security: Virus and antivirus
2. General information on computer networks
3. Networks withoutwires
4. Learning of a software application

ULS 231: Ultrasound Physics and Instrumentation I

Objective: The purpose of this course is to introduce students to the fundamental principles of acoustic physics.

Course outcome: At the completion of this course the student will be able to:

- Convert numbers from one unit to another in the metric system.
- Describe characteristics of a sound wave.
- Label waveform anatomy on diagrams of a continuous sound wave (CW) and pulsed sound wave (PW).
- Identify how the different types of wave interference are produced.
- Compare and contrast continuous wave (CW) and pulsed wave (PW) characteristics (i.e. duty factor).
- Describe the relationship between speed of sound, frequency and wavelength.
- Compare and contrast acoustic variables (density, pressure) and describe their effect on propagation velocity.
- Compare and contrast beam intensity, beam amplitude, beam power and beam area.
- Compare the relative propagating velocities and acoustic impedances (Z values) for soft tissue, bone, air, fat, etc.

- Compare the relationship between the media properties (density, compressibility) and their effect on sound propagation.
- Discuss specular reflection with regard to reflected energy level, normal incidence, and oblique incidence.
- Discuss scattering with regard to scattered energy level and frequency of the sound beam.
- Identify structures within the body causing reflection and scattering.
- Discuss the contributions of scattering and specular reflection to a diagnostic ultrasound image.
- Identify the effect of acoustic impedance on the sound beam.
- Apply Snell's law to varying degrees of angle of incidence.
- Diagram the angle of refraction in the presence of varying Z values and medium velocities.
- List and describe the components of sound attenuation.
- Discuss the relationship of attenuation to frequency, penetration, and attenuation coefficient.

1. The Nature of Sound

a. Wave Parameters: Propagation Velocity, Frequency, Wavelength, Wave Phase, Period, Amplitude, Intensity, Spatial Intensity, Temporal Intensity, Intensity Measurements

b. Acoustic Variables: Pressure, Particle Displacement, Density

2. **Interaction with Soft Tissue**: Attenuation, Attenuation Coefficient, Acoustic Impedance, Diffraction & Divergent, Reflection, Angle of Insonation, Reflection Coefficients, Specular Reflection, Non-specular Reflection (Scattering), Refraction, ultrasound terminology and units of measurement.

3. Sonographic Image Interpretation

a. Morphology: Contour, Internal Echo Pattern

b. Acoustic Physical Interactions

c. Artifacts in Interpretation: Reverberation, Posterior Acoustic Shadowing, Slice Thickness Artifact

d. Classification of Structures: Cystic, Solid, and Complex

4. Pulse Echo Imaging

a. Pulse Wave Parameters: Pulse Duration, Spatial Pulse Length, Pulse Repetition Frequency, Pulse Repetition Period, Duty Factor.

5. Real-time Scanning

a. General Considerations: Demonstration of Organ Motion, Anatomical Surveying, Optimizing Imaging Windows

b. Real-time Transducers: Electronic (phased) Probes, Beamformers

c. Pulses, Lines & Frames: Pulse Listen Time, Frame Time, Frame Rate

6. Transducers & Beam Geometry

a. Transducers: Piezoelectric Effect, Piezoelectric Crystals, Transducer Construction, Frequency Bandwidth, Q Factor

b. Beam Geometry: Beam regions, Divergence & Diffraction, Wavefront Formation (Huygens Principle), Beam Focusing

c. Resolution: Axial Resolution, Temporal Resolution, Lateral Resolution

7. Image Artifacts

a.Resolution Group: Axial Resolution, Lateral Resolution, Speckle Artifact popcorn, Slice (Section) Thickness Artifact

b. Propagation Path Group: Reverberation Artifact, Ring-down (Comet Tail) Artifact, Multipath Artifact, Mirror Image Artifact, Side Lobe Artifact, Grating Lobe Artifact

c.Attenuation Group: Posterior Acoustic Shadowing, Posterior Acoustic Enhancement, Refractory Shadowing

d. Miscellaneous Group: Speed Error Artifact, Range Ambiguity Artifact, Electronic Noise

8. Imaging System Components

a. Image Display Modalities: A-mode, B-mode, M-mode, Display Devices

b. Imaging System Components: Master Synchronize, Transducer, Pulse Transmitter, Receiver

c. Analog vs. Digital Methods: Binary Representation, Analog Scan Converter, Digital Scan Converter

d. Scanner Controls: Output Power, Dynamic Range, Pre-processing, Post-processing, Edge Enhancement, Fill-in Interpolation, Image Updating, Image Zoom, Grayscale Assignment, Thresholding, Image Polarity, Freeze Frame

- **Ultrasound ergonomics, General description of devices and technology II**

Providing equipment and instruments that adapt to the operator's.

- Introduction of principals of ergonomics
- Describing human body with respect to the necessary motions and activities
- Rational of space, time and time work: describing the anthropometric characteristics, motion efficiency, access to tools and instruments, complementary of teams roles and infections control
- Operator and environmental harmony establishment:describing the working posture and stress free work

ULS 232: Essentials of Ultrasound and Patients Care Skills

Objective: The purpose of this course is to introduce students to the various skills involve in patient care at the ultrasound unit and

Content

A. Essentials of ultrasound

- Sonographer development
- Sonographer as a student

- Sonographer safety issues
- Medico-legal aspect of sonography
- Ethics, professional development and leadership
- Sound future

B. patient care skills

- Patient-sonographers interaction
  - Sonographers obligation
  - patients right, environment, care
  - vital sign measurement
  - caring for patients with tubes
  - safety provision
  - Emergency medical situations
  - Assisting patients with special needs
- Communication and critical thinking skills
  - Basic survival needs
  - Communication characteristic
  - Communication factors
  - Patients with special communication problem
  - Professional communication

ULS 233: Obstetrics and Gynecological Ultrasonography

Objective: The purpose of this course is to provide students with the basic knowledge, techniques and procedures for evaluating the female pelvis and developing fetus with real-time 2-D and Doppler imaging. Students will be provided with scan lab demonstration and techniques that will allow them to apply what they learn in class to live scan models.

Content

- Indications for performing a pelvic ultrasound.
- Pelvic skeleton, muscles and ligaments.
- Location, anatomy (measurements, vasculature) and physiology of pelvic organs and structures and Pathophysiology.
- Uses of ultrasound in the assessment of normal pelvic organs and structures (sonographic appearance).
- Maternal physiology (ultrasound of the mentral and ovarian cycle)
- Infertility/endocrinology conditions and related anatomy and physiology.
- Assessment of normal and abnormal postmenopausal conditions.
- Pathologies of the female pelvis.
- Indications for performing an obstetrical ultrasound.
- Normal first, second and third trimester anatomy.
- Normal placenta and related anatomy and physiology.
- Normal amniotic fluid measurements.
- Multiple gestations.

- Obstetrics pathologies

ULS 234: Scanning Techniques and Protocols

Objective: The purpose of this course is to provide the students with standardize scanning criteria and image documentation for physician interpretation.

Content:

a) Abdominal Scanning Protocols
   - abdominal aorta scanning protocol
   - In vena cava scanning protocol
   - Liver scanning protocol
   - Gall bladder and biliary tract scanning protocol
   - Pancreas scanning protocol
   - Renal scanning protocol
   - Spleen scanning protocol

b) Pelvic scanning protocols
   - Female pelvis scanning protocol
   - Male pelvis protocol

c) Obstetrical scanning protocols
   - First trimester scanning protocol
   - Second and third trimester scanning protocol

ULS 235: Obstetric and Gynecological Ultrasonography Review

Objective: The purpose of this course is to prepare students to sit for their national board examination and the ARDMS board examinations.

Content

- Review on the normal anatomy of the female pelvic organs and associated structures
- Review on the normal fetal anatomy and pathologies associated with fetal anatomy
- Review on the ARDMS content for obstetric and gynecological sonography outline.
- Review on examination taking skills and strategies.
- Review mock examination on obstetric and gynecological sonography

ULS 236: Clinical Practice III

Objective: The purpose of this course is to introduce students' to clinical settings and training in the domain of obstetric and gynecological ultrasonography

Content

Continued discussion of the following topics as they relate to clinical education:

- Communication Skills (both verbal and written)
- Patient Care Skills

- Instrumentation
- Standard procedural scanning protocol of the female pelvic and image acquisition
- Standard procedural obstetric scanning protocol and image acquisition
- Observation and identification of Normal and Abnormal female pelvic organs and associated structures on images obtained
- Observation and identification of Normal and Abnormal fetal Anatomy on images obtained
- Ultrasound reporting and recording
- Clinical Competency evaluation.

ULS 237: Initiation to research

➢ **Initiation to research: 3 credit (45 hours); L, T, SPW**

1. Research in Ultrasonography
2. Sources of knowledge
3. Methods of reasoning
4. Stages of the research process (rational, assumptions, literature review, methodology, results/discussion, summary, bibliography)
5. Classification of research
6. Establishment of the Questionnaires
7. Ethics
8. Preparation and Presentation of Research Reports

ULS 241: Quality control in conventional ultrasounds techniques (ISO 9001), Environmental management system (ISO 1401) and the patient protection

Quality Control: 4 appropriations (60 hours); L, T, P, PW

1. **Quality control to the patients: H. Michel**
   - Introduction to a quality approach;
   - What is the quality;
   - TQM/quality assurance;
   - Home and patient satisfaction;
   - Inquiry;
   - Standards of home;
   - Introduction to Quality Control: (quality of the treatment and safety of the patient), - in radiotherapy; - in radiology.
2. **Quality control In radiotherapy**
   - S. Vynckier;
   - Importance;
   - Recommendations;
   - Quality control of devices of treatment;
   - Quality controls; Mechanical

- Controls of dosimetric qualities;
- Quality control systems for the planning;
- Quality control of scanners for use in radiotherapy; - dosimetry in vivo.

3. **Quality control radiology** - J. Causing;
    - Evaluation of doses to the patient;
    - Medical exposures;
    - The quantities used in patient dosimetry;
    - Measurement and Calculation of patient doses;
    - Ct scan;
    - Barium enema;
    - Interventional chest;
    - Optimization of the dose to the patient;
    - Reference level;
    - Factors of optimization;
    - Optimization of the dose and the quality of the image; - quality control.
4. **The quality assurance**
5. **Legal aspect of quality control**
6. **Quality control in mammography**
7. **Criteria of Quality of image,**
8. **Criteria for acceptability of facilities**

ULS 242: Sectional Anatomy- Abdominal and Pelvic

Objective: This course is aimed at providing the student with the knowledge of the different abdomino-pelvic organs and structures viewed from different sections

Content

- Anatomical landmarks, body planes and body regions.
- Anatomy layering of the abdominopelvic regions to show the locations of each organ and its relationship with the other organs/structures
    a) Abdominal cavity organs/structures
    b) Pelvic cavity organs/structures
- Cross sectional anatomy of the abdominopelvic regions
    a) Cross sectional anatomy of the abdomen
        i. TRV
        ii. SAG
    b) Cress sectional anatomy of the pelvis
        i. TRV
        ii. SAG
- Organ specific sectional anatomy (sonographic sections)

a) Liver and associate structures

i. TRV
ii. LONG

b) Pancreas
i. TRV
ii. LONG

c) Kidneys
i. TRV
ii. LONG

d) Abdominal Aorta /IVC
i. TRV
ii. LONG

e) Urinary Bladder/Prostate
i. LONG
ii. TRV

ULS 243: Abdomino-pelvic Ultrasonography

Objective: The purpose of this course is to provide students with the basic knowledge, techniques and procedures for evaluating Abdomino-pelvic organs with real-time 2-D and Doppler imaging. Students will be provided with scan lab demonstration and techniques that will allow them to apply what they learn in class to live scan models.

Content:

- General overview of the various body systems.
- Abdominal Vasculature (main arteries and veins)
- Normal anatomy and physiology of the GIT.
- Anatomy and physiology of Liver and the biliary system.
- Anatomy and physiology of pancreas and the spleen.
- Anatomy and physiology of urino-genital system (Kidneys, bladder and the prostate)
- Cell Injury – Overview and causes
- Reversible And irreversible changes of cell injury
- Pathologies associated with abdominal vasculature
- Pathologies associated with the liver
- Pathologies associated with Spleen, kidneys and the adrenal glands.
- Pathologies of Gallbladder, Bile duct and the Pancreas.
- Pathologies associated with the urinary bladder and the prostate gland.
- Pathologies associated with fluid collection.
- Anatomy and physiology of the male pelvic
- Pathologies associated with the male pelvic organs and associated structures

ULS 244: Abdomino-pelvic Ultrasonography Review

Objective: The purpose of this course is to prepare students to sit for their national board examination and the ARDMS board examinations.

Content

- Review on the normal anatomy of the abdominal organs and associated structures
- Review on pathologies associated with abdominal organs
- Review on abdominal organs standard scanning protocol
- Review on the ARDMS content outline.
- Review on examination taking skills and strategies.
- Review mock examination on abdominal ultrasound

ULS 245: Ultrasound Physics and Instrumentation Review

Objective: The purpose of this course is to prepare students to sit for their national board examination and the ARDMS board examinations.

Content

- Review on the basic principle of acoustic physics and ultrasound knobology.
- Review on the ARDMS content outline on ultrasound physics and instrumentation.
- Review on examination taking skills and strategies.
- Review mock examination on ultrasound physics and instrumentation I

ULS 246: Clinical Practice IV

Objective: The purpose of this course is to introduce students' to clinical settings and training in the domain of abdominal sonography.

Content

Continued discussion on the following topics as they relate to clinical education:

- Communication Skills (both verbal and written)
- Patient Care Skills
- Instrumentation
- Observation and identification of Normal and Abnormal Anatomy of abdominal organs on images obtained
- Standard procedural scanning protocol of the different abdominal organs and image acquisition
- Ultrasound reporting and recording
- Clinical Competency evaluation

ULS 247: Medical Law

- **Labor law: 1 credit (15 hours); L, T, SPW**

1. Definition of the right of labor, birth and evolution of labor law and sources
2. The contract of work (conclusion, implementation and rupture)

3. The conflicts of work (individual and collective)
4. The delegate of the staff, unions
5. Work accidents and occupational diseases
6. The hygiene and safety in the workplace

- **Administrative Law: 1 credit (15 hours); L, T, SPW**

Nature and function of the management of personnel, training and staff development, supervision and evaluation of employees; assessment of jobs and administration of salaries; trade union organizations and labor legislation, collective bargaining, grievance and strikes; administration services to employees. Practical application in industrial administration, public and the hospital.

- **Civil law: 1 credit (15 hours); L, T, SPW**

Society, ethics and the law; the foundation of the right and of the social life; concepts of health and education; place of the body in moral and in law; the right and duties of the individual and of the Community (right of patients, the rights of the person and the health care system); privatization and publicisation of health, respect for private life and social cost of health.

ULS 351: Public Health and Epidemiology /Politics and Health Management System

- **Public Health and Epidemiology**

Objective: The aim of this course is to improve or sustain the health status in individuals who are well and to promote the health of the public/ community.

Content:

A. Public Health

1. Hygiene

- Personal hygiene
- Environmental hygiene
- Introduction to health and public health
- Hospital hygiene
- Food hygiene

2. **Health and Development**

- Public health notion
- History and evolution of health care in Cameroon
- Stakes of health sector strategy
- Reorientation of primary health care:
- History and evolution of primary health care in Cameroon
- PHC-alma-at definition, components, and organization
- Lusaka conference, Bamako initiative (implication in Cameroon)
- Organization and functioning
- Health coverage

- Community health
- Health care financing
- Levels of health care: central, intermediate, and peripheral levels
- The health district
- An integrated health centre
- Minimum package of activities of an integrated health centre and a district hospital
- Principles of care in an integrated health centre
- Community involvement
- Co-financing, co-management
- Cost recovery
- Essential drugs and basic health package

B. Epidemiology/Entomology/Prophylaxis/Vaccination

a. Epidemiology

- Definition
- Epidemiological triangle
- Definition of term: incidence, prevalence, morbidity, lethality, contagiousness, attack rate, level of alertness, primary and secondary alertness
- Epidemiological survey/Introduction to demography: birth rate, natural growth rate
- Epidemiology concepts: endemics, epidemics, endemo-epidermics, pandemics
- Demographic notion

b. Entomology

- Definition and general information on arthropods of medical importance, vulminants, vesicant of medical importance and inticant insects
- Brachycera
- Dipthera: cyclorrhapha (stinging insects, blood sucking insects, tse-tse flies, mosquitoes, chrisops
- Orthorrhapha: Cyclops
- Nematocera: culicidae(culex, anopheles, acdes)
- Ceratopogonidoe (phlebotomus, celicoides)
- Aphaniptera (fleas)
- Anoplura(lice)
- Arachnida: spider, scorpion, mites
- Malacopathia
- Bullosa, planorbid

c. Prophylaxis

- Definition of prophylaxis
- Prophylactic measures
- Prophylactic declaration
- Early screening
- Isolation
- Radioactive pollution control
- Chemoprophylaxis
- Quarantine
- Determination rate
- Destruction of insects
- Fight against snails
- Physical chemical and

d. Vaccination/immunization

- Definition and classification
- Expanded program on immunization: origin, target population
- Origin, target population, main vaccines, vulnerable groups
- Vaccination strategies and vaccine reactions
- Management of immunization activities
- Planning, organization, supervision, evaluation of immunization coverage
- Procurement and storage of vaccines/cold chain
- Monitoring of immunized population and IEC
- Cameroon vaccination schedule: new born, pre-school age and adults

C. Alternative and Traditional Medicine

- Traditional medicine
- Medical practices in the traditional environment
- Alternative medicine: Chinese medicine, medicinal plants, homeopathy and manual practices

D. Health Promotion

- Definition
- Health promotional activities
- Benefits of health promotion
- The role of the nurse in health promotion

E. Occupational/school Health

- Aims
- Objectives
- Principles
- Strategies

- **Politics and Health Management System**

Objective: The aim of this course is to clearly bring out the classification of the Cameroon health system.

Content:

1. Definition of concepts: health system, health policy

2. Schematic representation of a health system
3. History and evolution of health systems in Cameroon
4. Description of the national health system in Cameroon: concept on the decisions of the conferences of Lusaka and Bamako, basic elements of the reorientation primary health care, health pyramid and its components, the national health system in Cameroon with the unit of integration, principles of care as defined by the reo. S.S.P, structure of the health district with its minimum package of activities, concept of role, concept of the financing and management of activities, concept on the recovery of costs, concept on the essential drugs and generic, concept is based on the document a sectoral strategy Health , basic concept on the strategy paper for growth and employment, basic concept on the Poverty Reduction Strategy Paper, a concept on the Millennium Development Goals (MDGS), a concept on social inequality, the servicing of the health district: steps, a concept on the priority program of health in Cameroon: justification of a health program, components of a program, Determinants The success Of health programs.

ULS 352: Ultrasound Physics and Instrumentation II

Objective: The purpose of this course is to introduce students to the fundamental of Doppler physics and hemodynamic.

Content

- Doppler instrumentation and hemodynamics
  - Doppler effect
  - Factors influencing the magnitude of the Doppler shift frequency
  - Continuous wave and pulsed wave Doppler
  - Doppler PRF, Nyquist limit and aliasing
  - Color flow imaging
  - Power Doppler imaging
  - Duplex Doppler imaging
  - Spectral analysis
  - Doppler artifacts
  - Hemodynamics (laminar and turbulent flow, velocity profiles, energy, etc.)
- Quality assurance / quality control of equipment
  - Preventive maintenance
  - Malfunctions
  - Performance testing with phantoms
- Recording and storage devices, bio effects and ALARA

ULS 353: Basic echocardiography

Objective: The purpose of this course is to introduce students to the structure of the heart, its associated pathologies and the echographic scanning protocol involve in diagnosing heart diseases.

Content

A) Echocardiography

a) Anatomy of the thoracic cavity

b) Normal Anatomy of the heart

- Location and size of the heart
- Heart Chambers, valves and layers of the heart wall
- Normal variants associated with the heart
- Sonographic appearance of heart structures

c) Physiology of the Human Heart

- Circulatory systems (systemic, pulmonary, coronary)
- Conduction system
- Electrocardiogram (correlation of ECG with atrial and ventricular systole)
- Cardiac cycle (systole/diastole, heart sound, cardiac output)

d) Echocardiography scanning protocol and measurements

- Windows of the heart and their views (with the corresponding structures examined)
- Patient preparation and position
- Transducer selection and orientation
- Heart survey

i. 2 D examination protocol and measurements

ii. M-Mode evaluation and measurements
(Dimension of the chambers and wall thickness, valvular evaluation, LVEDD, LVESD etc)

iii. Blood flow Haemodynamics and Doppler evaluation/ measurements
(Ejection fractions, pressure gradient, mean pressure gradient, peak velocity, mean velocity etc

- Echocardiography reporting

e) Valvular Diseases

- Valvular Stenosis
- Valvular Regurgitation
- Valvular prolapse
- Prostatic Valve
- Infective Endocarditis

f) Pericardial Diseases

- Pericardial Effusion
- Cardiac Tamponade
- Constrictive Pericarditis

g) Myocardial diseases

- Restrictive Cardiomyopathies
- Endomyocardial Fibrosis
- Amyloidosis
- Sarcoidosis
- Hemochromatosis

h) Congenital Heart Diseases

- Atrial Septal Defect
- Endocardial Cushion Defect

- Ventricular Septal Defect
- Patent DuctusArteriosus
- Ebstein's Anomaly
- Valvular Pulmonic Stenosis
- Tetralogy of Fallot
- Tricuspid Atresia
- TruncusArteriosus
- Complete TGA
- Corrected TGA
- Coarctation of Aorta
- Eisenmenger Syndrome
- Visualizing Coronaries

i) Miscellanous

- Ischemic Heart Disease
- Systemic Hypertension
- Pulmonary Hypertension
- Cardiac Tumors
- Carcinoid Heart Disease
- Evaluation of Left Ventricular Function
- Left Ventricular Diastolic Function

ULS 354: Introduction to Conventional X-ray

Objective: The aim of this course is to provide the students with knowledge and basic skills in medical radiology (conventional x-rays)

Content:

- Introduction to radiographic imaging
  - Generator
  - X-ray tube
  - Control console
    - kVp and mA and their functions
    - functions of the rectifier
- Radiographic Film Production
  - Radiography films screens and cassettes,
  - Manual film processing
  - Automatic film processing
- - Effects of patient status on radiographic images Initial set up of the radiologic suite
  - Design and placement of the x-ray suite
  - Design of the darkroom
  - Equipment recommendations
  - State requirements
- Introduction to radiographic positioning and procedures.
  - radiographic terminology, body movement terminology, anatomical plans
  - bony landmarks, basic rules for radiographic positioning
  - radiographic positioning and procedure for chest and spine

- radiographic positioning and procedure for abdomen and pelvic girdle
- radiographic positioning and procedure for upper and lower extremities

- Introduction radiographic contrast media exams
  - Brief description of the different types of contrast media
  - radiographic positioning and procedure for contrast media exams
- Radiographic evidence of common pathologies
- Quality control and radiation safety
  - Quality control
  - Radiation protection

ULS 355: Basic Electrocardiography (ECG)

Objective: This is aimed at enlightening the students on heart electrical current and how it can be used for diagnoses.

Contents

- **The basics of EKG**
  - Electricity and the heart
  - Time and voltage
  - P waves, ORS complexes, T waves and some straight lines
  - The 12 views of the heart
  - Vectors
  - The normal 12 lead EKG
- **Hypertrophy and Enlargement of the heart.**
  - definition
  - Axis Deviation, hypertrophy and enlargement
  - Atrial enlargement
  - Ventricular Hypertrophy
  - Cases
- **Arrhythmias**
  - Clinical manifestation of arrhythmias
  - Why arrhythmias happen
  - Rhythm shops
  - The four basic types of arrhythmias
  - Ectopic rhythms
  - Ventricular arrhythmias
  - Cases
- **Conduction blocks**
  - What is conduction block?
  - AV blocks
  - Bundle branch block
  - Hemiblocks

- Pacemakers
- Preexcitation syndromes
- Definition
- Wolff – Parkinson – white syndrome
- Lown – Ganong-levinesyndome
- Associated arrhythmias
- Cases

- **Myocardial Ischemia and Infarction.**
  - Definition,
  - How to diagnose a myocardial infarction and ischemia
  - localizing the infarct, Non-Q wave myocardial infarctions
  - Angina
  - Limitation of the EKG in diagnosing – an infraction.

ULS 356: Clinical Practice V

Objective: The purpose of this course is to allow the student to continue rotational clinical training in the domain of echocardiography, electrocardiography and basic x-ray.

Content

Continued discussion of the following topics as they relate to clinical education:

- Communication Skills (both verbal and written)
- Patient Care Skills
- Instrumentation
- Observation and identification of Normal and Abnormal Anatomy and physiology of the heart on images/strip obtained
- Observation and identification of Normal and Abnormal Anatomy of the musculoskeletal system on images obtained
- Standard procedural scanning protocol of the heart and image acquisition
- Standard procedural scanning protocol of the musculoskeletal system and image acquisition
- Ultrasound/X-ray reporting and recording
- Clinical Competency evaluation

ULS 357: Medical Law and Legal Issues

Content:

- **Labor law: 1 credit (15 hours); L, T, SPW**

1. Definition of the right of labor, birth and evolution of labor law and sources
2. The contract of work (conclusion, implementation and rupture)
3. The conflicts of work (individual and collective)
4. The delegate of the staff, unions
5. Work accidents and occupational diseases

6. The hygiene and safety in the workplace

- **Administrative Law: 1 credit (15 hours); L, T, SPW**

  Nature and function of the management of personnel, training and staff development, supervision and evaluation of employees; assessment of jobs and administration of salaries; trade union organizations and labor legislation, collective bargaining, grievance and strikes; administration services to employees. Practical application in industrial administration, public and the hospital.

- **Civil law: 1 credit (15 hours); L, T, SPW**

  Society, ethics and the law; the foundation of the right and of the social life; concepts of health and education; place of the body in moral and in law; the right and duties of the individual and of the Community (right of patients, the rights of the person and the health care system); privatization and publicisation of health, respect for private life and social cost of health. Autonomy, participation, etc.

ULS 361: Introduction to Ultrasound Guided Techniques

Objective: The purpose of this course is to provide students with introductory knowledge, techniques and procedures for ultrasound guided techniques.

Content:

- Ultrasound guided abdominal procedures
  - drainage of pleural effusion, drainage of abscesses
  - The evaluation of joint effusions, bursitis, and Baker's cysts etc.
  - percutaneous Gastrointestinal Biopsy
  - Intraoperative ultrasound and Laparoscopic ultrasound
  - Ultrasound contrast agents in the abdomen
  - The treatment of primary and secondary hepatic tumours by percutaneous methods
  - Endoscopic ultrasound

- Ultrasound guided obstetrics and gynecological procedures
  - amniocentesis
  - Transvaginal oocyte retrieval
  - drainage of abscesses, drainage of cystic masses
  - Cordocentesis
  - Chorion villus sampling
  - Embryo reduction, Fetocide, Intrauterine therapy

- **Structure, Function and Maintenance of Equipments**

Objective: An ultrasound work alone for long periods of time, therefore emphasis is placed on equipment maintenance and developing an understanding of how the equipment operates in order to facilitate repairs.

Content: The ultrasound Clinic, Its instruments and equipment. Instruments: types, identification, source of supply.

ULS 362: Introduction to Pediatrics ultrasound

Objective: This course aims at introducing the students to the basic knowledge and skills involved in Pediatrics sonography.

Content

General issues of methods and equipment

Prenatal sonographic diagnosis of congenital anomalies

a) The urinary tract

- Embryology
- Ultrasound scanning preparation, techniques and normal ultrasound appearance
- Urinary tract anomalies

b) The adrenal glands

- Embryology
- Normal appearance and ultrasound technique
- Abnormalities and tumors of the adrenal gland

c) The liver, spleen and pancreas

- Embryology of the liver
- The normal pediatric hepatobiliary system
- Abnormalities of the neonatal biliary system
- Abnormalities of the neonatal liver
- Diffuse abnormalities and focal lesion of the pediatric liver
- Abnormalities of the gallbladder and bile ducts in childhood
- Normal spleen, congenital variants and abnormalities of the spleen
- Normal pancreas and abnormalities of the pancreas

d) The abdomen and bowel

- Embryology
- Ultrasound scanning preparation, techniques and normal ultrasound appearance
- Abnormalities of the GIT

e) The female reproductive system

- Embryology
- Normal ultrasound appearance and technique
- Abnormalities

f) The scrotum and testes

- Embryology
- Normal ultrasound appearance and technique
- Abnormalities of the scrotum and testes

g) The head, neck and spine

I. The head
   - Ultrasound techniques and normal anatomy of the head
   - Abnormalities of the head

II. The neck
   - Ultrasound techniques and normal anatomy of the neck
   - Abnormalities of the neck

III. The spine
   - The m Ultrasound techniques and normal anatomy of the spine
   - Abnormalities of the spine

h) The chest

i) Musculoskeletal system

j) Pediatric interventional ultrasound

ULS 363: Introduction to Musculoskeletal Ultrasound

Objective: The purpose of this course is to introduce students to the musculoskeletal structure of the human body, its associated pathologies and the ultrasound scanning protocol involve in diagnosing the diseases

Content

- **Indications for MSK ultrasound including:**
  - sport injuries
  - periarticular masses
  - assessment of rheumatologic disorders
  - postsurgical joint assessment
  - Anatomical definitions and conventions including
  - body sections and anatomical planes
  - body orientations

- **Bones Muscles, ligaments and tendons of the hand and wrist**
  - The radius and ulna
  - The elbow joint
  - The humerus
  - Tendons of the hand and wrist
  - Ligaments and tendons of the elbow
  - Muscles of the anterior forearm including:
    - Flexors of the forearm
    - Extensors of the forearm
    - Rotators of the forearm
  - Flexors of the wrist, hand and fingers
  - Extensors of the wrist, hand and fingers
  - Muscles of the posterior forearm
  - Patient positioning & examination technique
  - Normal ultrasound appearances

- **Hand & wrist pathology including**:
    - soft tissue tumours of the hand and wrist
    - tendon pathology
    - De Quervain's disease
    - trigger finger (or digit)
    - trauma of the tendons and/or ligaments of the hand
    - carpal tunnel syndrome

- **Indications & examination technique for elbow ultrasound including:**
    - elbow joint effusion
    - elbow ganglion
    - tennis elbow
    - lateral epicondylitis
    - golfer's elbow
    - medial epicondylitis
    - elbow fracture
- **General anatomy of the shoulder including:**
    - the scapula
    - the clavicle
    - the shoulder joint
    - the rotator cuff
- **Muscles of the shoulder including:**
    - flexors of the upper arm
    - extensors of the upper arm

- Patient positioning
- Scanning technique
- Indications for shoulder ultrasound including:
    - otator cuff tears
    - intra or extra-articular fluid collections
    - abnormal contour of the subdeltoidbursae
    - elevation of the humeral head
    - calcific tendonitis
    - biceps tendonitis and tenosynovitis
    - dislocation (subluxation) of the biceps tendon
    - biceps tendon tears and/or rupture
    - SA-SD bursal effusion and/or bursitis
    - fracture (Hills Sachs deformity)
- **Ultrasound of the Foot and Ankle**
    - Bones of the lower leg
    - Bones of the ankle and foot

- Muscles that move the ankle, foot, and toes including:
    - dorsal flexors of the lower leg
    - plantar flexors of the lower leg
    - foot invertors
    - foot evertors

- Ligaments and tendons of the ankle
- Indications for ultrasound of the foot and ankle
- Patient positioning and examination technique
- Pathology of the ankle and foot including:
    - tendon and/or ligament tears
    - tendonitis and tenosynovitis
    - plantar fasciitis
    - joint effusions
    - ganglions
    - cellulitis
    - Morton's neurom

➢ **Ultrasound of the Knee and Hip**

- Bones of the upper leg
- The knee joint
- Ligaments of the knee
- Muscles that move the lower leg
- Muscles that move the upper leg
- Patient positioning and examination technique including:
    - anterior approach
    - bursae of the knee
    - medial approach
    - lateral approach
    - posterior approach
- Pathology of the knee including:
    - knee trauma
    - tendon and/or ligament tears
    - tendonitis
    - bursitis
    - meniscal pathology

ULS 364: Basic Vascular Ultrasound

Objective: The purpose of this course is to introduce students to the structure of the vascular tree, its associated pathologies and the duplex scanning protocol involve in diagnosing vascular diseases.

Content

- Normal anatomy and physiology of the vascular trees
- Arterial and venous hemodynamic
- Measuring blood pressure
- Normal and abnormal Pattern of blood flow in arteries and veins (colour and spectral Doppler patterns)

- Ultrasound assessment of the extra cranial cerebral circulation
- Duplex assessment of lower limb arterial disease
- Duplex assessment of upper extremity arterial disease
- Duplex assessment of aneurysms
- Anatomy of the lower limb venous system and assessment of venous insufficiency
- Duplex assessment of deep venous thrombosis and upper limb venous disorders

ULS 365: Basic Ultrasound of Small Parts

Objective: This course aims at introducing the students to the knowledge and basic skills involve in Small Parts sonography.

Content:

a) Small parts scanning protocol
   - overview

b) Scrotum Scanning
   - Anatomy
   - Physiology
   - Sonographic appearance
   - Normal variants

c) Thyroid and parathyroid glands.
   - Location
   - Anatomy
   - Sonographic appearance
   - Normal variants

d) Breast Scanning
   - Anatomy
   - Physiology
   - Sonographic appearance
   - Normal variants

e) Ocular Ultrasound
   - Anatomy
   - Physiology
   - Sonographic appearance
   - Normal variants

f) Pathologies
   - Scrotal, Thyroid and parathyroid, Breast and the Ocular pathologies

ULS 366: Clinical Practice VI

Objective: The purpose of this course is to allow the student to continue rotational clinical training in the domain of vascular, small parts and musculoskeletal ultrasound.

Content

Continued discussion of the following topics as they relate to clinical education:

- Communication Skills (both verbal and written)
- Patient Care Skills
- Instrumentation
- Observation and identification of Normal and Abnormal Anatomy
- Standard procedural scanning protocol of the different organs and image acquisition

- Ultrasound reporting and recording
- Clinical Competency evaluation

ULS 367: Project Writing

- **Drafting of the research project: 3 credits (45 hours); L, T, PW**

(It depends on the theme of work of the learner; it must be drafted in accordance with the plan below)

1. Summar
2. Introduction: 2 pages maximum. The introduction, it is spring loaded to the problematic
    - One poses the question of research;
    - It sets the Assumptions;
    - On fixes the general objective;
    - It sets out the specific objectives and sets out the plan.
3. Chapter I, II: The literature review (Review of the literature)
4. Chapter II, III: The methodology
5. Chapter III, IV: Presentation of the results and discussion
    - Conclusion and Recommendations

Field : MEDICAL AND BIOMEDICAL SCIENCES

Specialty :

NUTRITION AND DIETETICS

Field: MEDICAL AND BIOMEDICAL SCIENCES

Specialty: Nutrition and Dietetics

1. Objective of the training

This specialty aims to train nutrition professionals who can apply nutrition science to the nutrition and education of individuals and groups, whether they are healthy or ill.

2. Research Skills

→ **Generic skills**

- Work independently, collaborate in a team;
- Analyze, synthesize a professional document (French, English);
- Communicate orally, in writing, in business or outside (French, English);
- Participate in / lead a project management process;
- Know and exploit the professional and institutional networks of the food and nutritional sectors.

→ **Specific skills**

- Evaluate the nutritional status of a patient;
- Formulate diets and make dietary dishes;
- Facilitate therapeutic education sessions;
- Interact with other specialists in the field of food in the food industries, catering and sports medicine by sharing its skills on nutritional quality and nutritional balance.
- Conduct consumer surveys and participate in the development of new products.

3. Opportunities

- Hospitals
- Educational establishment;
- Sports Center;
- Food industry ;
- House of cure or retirement.
- Nutritionist or dietetician (counsellor)
- Food or restaurant manager
- Food and health reporter
- Editor, advertising or marketing specialist
- Catering manager
- Teacher

4. Organization of the Teachings

Semester 1

Field : Medical and Biomedical Sciences		Specialty: Nutrition and Dietetics					
Code	Courses Titles	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
NTD111	Anatomy and Physiology I	30	5	5	5	45	3
NTD112	Microbiology I (Bacteriology - Parasitology – Biochemistry)	55	10	20	5	90	6
Professional courses 60% (4 UC) 18 credits 270 hours							
NTD113	Nutritional needs I	40	15	15	5	75	5
NTD114	Structural Biochemistry	35	15	5	5	60	4
NTD115	Dietary Allowances I	40	20	10	5	75	5
NTD116	Clinical Internship I	/	/	60	/	60	4
Transversals courses 10% (1 UC) 3 credits 45 hours							
NTD117	Bilingual training	25	5	10	5	45	3
Total		**285**	**75**	**12**	**78**	**450**	**30**

Semester 2

Field : Medical and Biomedical Sciences		Specialty: Nutrition and Dietetics					
EU CODE	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	PW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
NTD121	Anatomy Physiology II	35	20	15	5	75	5
NTD122	Sociology -Anthropology and Medical Psychology	30	15	10	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
NTD123	Introduction to Food	40	15	15	5	75	5
NTD124	Food Cooking Techniques	25	10	20	5	60	4
NTD125	Nursing Practice	40	15	15	5	75	5
NTD126	Clinical Internship II	/	/	60	/	60	4
Transversals courses 10% (1 UC) 3 credits 45 hours							
NTD127	Information and Communication Technologies (ICT)	40	/	/	5	45	3
Total		**235**	**56**	**94**	**65**	**450**	**30**

Semester 3

Field : Medical and Biomedical Sciences		Specialty: Nutrition and Dietetics					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
NTD231	Public Health : Epidemiology and Environmental Health	40	15	15	5	75	5
NTD232	Metabolic Biochemistry	30	15	10	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
NTD233	Dietetic Pathophysiology I	30	15	10	5	60	4
NTD234	Food Microbiology	40	15	15	5	75	5
NTD235	Dietary Planning	35	15	20	5	75	5
NTD236	Clinical Internship III	/	/	60	/	60	4
Transversalscourses 10% (1 UC) 3 credits 45 hours							
NTD237	Medical English/Medical French	25	5	10	5	45	3
Total		**230**	**65**	**93**	**62**	**450**	**30**

Semester 4

Field : Medical and Biomedical Sciences		Specialty: Nutrition and Dietetics					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
NTD241	Public Health II (Demography - Health Promotion)	30	15	10	5	60	4
NTD242	Food Biochemistry Practical Techniques	25	20	25	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
NTD243	Dietetic Pathophysiology II	30	15	10	5	60	4
NTD244	Nutritional Needs II	40	15	15	5	75	5
NTD245	Dietary Allowances II	40	15	15	5	75	5
NTD246	Clinical Internship IV	/	/	60	/	60	4
Transversalscourses 10% (1 UC) 3 credits 45 hours							
NTD247		26	11	3	5	45	3
Total		**227**	**70**	**100**	**53**	**450**	**30**

Semester 5

Field : Medical and Biomedical Sciences		Specialty: Nutrition and Dietetics					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
NTD351	Ergonomics in the Food Industry	30	15	10	5	60	4
NTD352	Molecular Genetics	40	20	10	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
NTD353	Management And Economic In Dietetics	40	10	20	5	75	5
NTD354	Food Allergies	45	15	10	5	75	5
NTD355	Family Assesment	30	15	10	5	60	4
NTD356	Clinical Internship V	/	/	60	/	60	4
Transversal scourses 10% (1 UC) 3 credits 45 hours							
NTD357	Computer business	20	5	15	5	45	3
Total		**190**	**37**	**180**	**43**	**450**	**30**

Semester 6

Field : Medical and Biomedical Sciences		Specialty: Nutrition and Dietetics					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
NTD361	Microbiology II (Virology - Mycology - Immunology)	30	15	10	5	60	4
NTD362	Practical Food Microbiology and Mycology	25	15	30	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
NTD363	Enzymology	30	15	10	5	60	4
NTD364	Practical Diet Planning and Cooking Techniques	25	15	30	5	75	5
NTD365	Food Hygiene and Sanitation	15	10	30	5	60	4
NTD366	Practical Project	/	/	70	5	75	5
Transversals courses 10% (1 UC) 3 credits 45 hours							
NTD367	Civic Education and Ethics / Initiation to the Law	35	5	/	5	45	3
Total		**196**	**49**	**153**	**52**	**450**	**30**

5. Courses content

NTD111: Anatomy and Physiology I

- **Anatomy - Physiology I: 4 appropriations (60 hours); L, T, SPW**

1. Nervous System

- Histology of the central and peripheral nervous system;
- Physiology of the central and peripheral nervous system: nervous influx, transmission of the influx (chemical mediators, synapse, driving plate), arc reflex;
- Organization of the central nervous system and functional localization: spinal cord, and medulla oblongata, brain, meninges and CSF;
- System Device nervous, cranial nerves, plexus;
- Neuro-vegetative system: sympathetic and parasympathetic.

2. The Endocrine System

- Endocrine pancreas;
- Thyroid: anatomy - Histology - physiology;
- Parathyroids: anatomy physiology, metabolism of calcium;
- Adrenals: Histology Anatomy, Physiology.
- System hypothalamo-pituitary;
- The stimulines.

3. Organ of meaning

- The eye : the view;
- The ear: hearing and balance;
- Smell: Taste;
- Touch.

4. System Musculoskeletal

- Ceos;
- The osteites;
- The osteomyelitis.

5. Digestive System

- General topography;
- The peritoneum;
- Main categories of foods :
  - ✓ Energy needs;
  - ✓ Animal heat.

6. Urinary system

- Structure and Physiology of the following organs: the kidney, the ureters, the urethra and bladder;
- Excretory Role of the skin.

NTD112: Microbiology I - Bacteriology - parasitology - Biochemistry

- **Microbiology - Bacteriology: 1 credit (15 hours); L, T, SPW**
    1. **Introduction to the Bacteriology**
        1. Place in the living world and ecological role of micro-organisms (saprophytes, commensalism, symbiosis and pathogens).
    2. **General Bacteriology**
        2. Structure of the bacterial cell, nutrition and growth, metabolism (anaerobic, aerobic conditions, fermentation), reproduction and genetics (genetic transfer, mutation), pathogenicity (notions of virulence, toxin).
    3. **BacterialEcology**
        3. Role of the field, reference mechanism of the host against the infection (Immunosuppression, opportunistic bacteria, nosocomial infections).
    4. **Presentation of the bacterialsystematic**
    5. **Study of the main species or bacterial groups pathogenic for man or likely to be**
        4. Staphylococci, Streptococci, pneumococci, gonococcus, (history, habitat and epidemiology, fill pathogen, Bacteriological characters, diagnosis, treatment and prophylaxis).
    6. **Bacteriological techniques**
        5. Basic Techniques (microscopic examinations, insulation and identification), different types of levy in Clinical Bacteriology (technical and transport), methods of sterilization and preparation of media of cultures.
    7. **Procedures for the sending of samples and of bacterial strains**
    8. **Techniques of conventional identifications (1st part).**
- **Parasitology: 1 credit (15 hours); L, T, SPW**
    1. Systematic study of human parasites, few definitions and concepts prior, mode of parasitism
    2. Location of parasites
    3. Epidemiology and evolutionary cycle
    4. Parasitic disease: clinical description, pathology, defense of the body;
    5. Prophylaxis (general and individual)

- **Biochemistry: 1 credit (15 hours); L, T, SPW**
    1. Generality : enzyme, vitamin, a hormone
    2. Basic concept of clinical biochemistry General: definition of a metering and exploration

3. Learning of normal and abnormal physiology of carbohydrates, lipids, proteins
4. Physiological study of different biochemical parameters of medical interest: techniques of biochemical assay and interpretation, normal values of biochemical constituents in biological fluids and pathological variations (1st part)

NTD113: Nutritional Needs I

Objective:

Content :

- Macronutrients
- Micronutrients
- Fiber and Phytochemicals
- Water
- Nutrients and their Functions
- Purpose of Nutrition
- Importance of Nutrition Labels

NTD114: Structural Biochemistry I

Content:

1- Basic qualitative and quantitative composition of living matter. Oligo element
2- Water and minerals
3- Carbohydrates

- Monosaccharides:
  - Isomerism
  - Ring structure
  - Physico chemical properties
  - Analytical methods
  - The different monosaccharides and derivatives
- Oligosaccharides:
  - Glycosidique bonds: structure, chemical and enzymatic hydrolysis
  - Principal disaccharides: sucrose, lactose, maltose
- Polysaccharides:
  - Structure, properties and localization
- Heterosaccharides: definition and examples

4- Lipids and liposoluble compounds

- Fatty acids
  - Structure and nomenclature

- Principal saturated and non saturated fatty acids

- Glycerides

- Structure, properties and localization
- Classification and example

- Glycophospholipids

- principal groups
- structure properties and localization of lecethines

- Shingolipids
  - principal groups
  - structure, properties and localization of shingolipids

- Liposoluble compounds
  - Sterols and steroids: principal representative, structure and properties of cholesterol
  - Liposoluble vitamins: structure and role of vitamin A, D, E, K.

NTD115: Dietary Allowances

Content:

- Definition and Applications
- Estimation of Physiological Requirements
- Establishment of dietary recommendations
- How are RDAS to be met?
- Pharmacologic and Toxic Effects of Nutrients
- Nutrient Allowances for infants
- Nutrient Allowances for the elderly
- Conditions that may Require Adjustment in Application of RDAS
- Application of Recommended Dietary Allowances
- Nutritional Allowances as Guidelines for food Supplies and for Health and Welfare Programs

NTD116: Clinical Internship I (Immersion)

- **Clinical Internship I**

NTD117: Bilingual training

- **Bilingual Training: 3 credits (45 hours); L, T, SPW**
  - **English: 1.5 credits (22 hours 30mn)**

1. Vocabulary

- Technical and usual vocabulary of the specialty

2. Grammar

3. Bilingual expression

- Understanding in interaction in Technical Discussions
- Continuous oral communication: Show, explain, develop, summarize, account, comment;
- Interactions oral communication

4. Autonomous reading of "writings" of all levels

- Lead by a quick reading to understand the general sense;
- Browse a text long enough to locate desired information;
- Gather information from different parts of the document or of the different documents in order to accomplish a specific task.

5. Write clear, detailed texts

- Essay writing;
- Application for employment;
- C.V;
- Letter of motivation;
- Letter / memo writing and minutes of a meeting

- **French : 1.5 credits (22 hours 30mn)**

1. Vocabulaire

Vocabulaire technique usuel

1. Grammaire

- Du verbe : Conjugaison aux temps communément utilisés – présent, passé composé, imparfait, futur, conditionnel, plus-que-parfait, l'impératif, l'infinitif, la voix passive ;
- De l'adjectif : qualificatif, possessif, démonstratif, interrogatif, numéraux, indéfinis ;
- Du nom et son article: masculin/féminin ; singulier/pluriel ; dénombrable et non-dénombrable ;
- Du pronom : personnel, possessif, interrogatif, démonstratif, relatif, indéfini ;
- De l'adverbe et de la locution adverbiale : pour dire comment, où, quand et pourquoi ;
- Des fonctions grammaticales.

3. Expression et communication

- Compréhension et interaction au cours d'une discussion technique ;
- Communication orale courante ;
- -Communication orale interactive ;

- De la phrase : simple, complexe, composée ; interrogative, déclarative, exclamative et impérative.
- Lecture rapide et compréhension de texte ;
- Synthèse de texte
- De la communication : rédaction de texte, d'instructions, de rapport, d'une correspondance, d'une lettre recommandation ou de motivation, d'une demande d'emploi, d'une demande d'explication, d'une réponse à une demande d'explication, d'un CV ;
- Gestion d'une table ronde/discussion : la prise de notes, la prise de parole
- Expressions figées

NTD121: Anatomy and Physiology II

- **Cardiovascular System: 1 credit (15 hours); L, T, SPW**

1. **The Heart**
   - Anatomy: configuring external and internal structure, histology of the heart muscle;
   - Physiology: automatism, revolution, noises of the heart, the electrocardiogram.
2. **The vessels**
   - Anatomy: arteries, veins: their structure, Anatomy of the large and the small circulation;
   - Circulatory physiology: blood pressure, venous circulation and capillary.
3. **The blood**
   - The plasma and dissolved substances, figurative elements, hematopoiesis, haemolysis;
   - Coagulation;
   - blood group.
4. **The reticuloendothelialsystem**
   - Rate, lymphatic, thymus.

- **Respiratory system: 1 credit (15 hours); L, T, SPW**

1. **Anatomy**
   - Upper airway (anatomy endoscopy and non-surgical), nasal cavity, pharynx, larynx, trachea;
   - Bronchus, lungs, pleura, anatomy and histology.
2. **Physiology of Breathing**
   - Mechanisms for regulating nervous;
   - Chemical phenomena.

- **Digestive system: 1 credit (15 hours); L, T, SPW**

1. General topography; the peritoneum
2. The main categories of food

- Energy Needs;
- Animal heat.

➢ **Genito-urinary system (woman-man): 2 credits (30 hours); L, T, SPW**

1. Structure and Physiology of the following organs: the kidney, the ureters, the urethra and bladder
2. ExcretoryRole of the skin
3. Description anatomy and physiology of the genitalia of the Man and the woman

NTD 122:Sociology - Anthropology and Medical Psychology

→ **Sociology - Anthropology and Psychology : 6 credits (90 hours); L, T, SPW**

1. Sociology - Anthropology

- Introduction to the Sociology ;
- Concept of anthropology and ethnology;
- Evolution of life and of man in its dimensions biological, psychological and social assistance;
- Culture and cultural PWnomena,
- The innate, the acquis, myths and beliefs;
- Cultural attitudes to health, disease, death;
- Medical practices of yesterday, today alternatives and traditional medicine;
- Notions of group; social groups (family, working group, institution);
- Dynamics of small groups;
- Dynamics of Conflict (leaders);
- Communication and communication networks.

2. Psychology

- **Introduction to Psychology**
  - The major stages of life;
  - Emotional development, intellectual, psychomotor and psychosocial of the individual;
  - First Age, second age, age pre-school, school, adolescence, adulthood, aging;
- **The Body: Body schema and body image**
- **The Personality**
  - Dynamic aspect of the personality;
  - The unconscious;
  - Pulsion, refoulement;
  - Motivation.
    - **Mechanism of defense and of adaptation**

- Affective states : feeling - emotion - fear - anger - Distrust - a concern - Lines and behavior - the different modes of relationship;
- Social: educative - cooperative - of authority - of dependency - of acceptance - of mothering;
- The relationship between careers - Treated: specificities.

NTD123: Introduction to Food

Objective:

Content:

- Defining functional foods
- Food energy
- Types of food and their classification
  - ✓ Carbohydrates
  - ✓ Fats
  - ✓ Cholesterol
  - ✓ Protein
  - ✓ Vitamins
  - ✓ Minerals
- Food Allergy Challenges
- Importance of Food
- Guidelines for a new eating pattern
- Dietary terms
- How diet has changed over time.

NTD124: Food Cooking Techniques

Objective:

Content:

1. **Kitchen Equipment, Lining up of kitchens and Food Sectors**
   - Material and Apparatus within the Food Chain
   - Buildings
2. **Cooking Techniques**
   - Boiling;
   - Steaming;
   - Baking;
   - Frying;
   - Grilling.
3. **Practical use of Foods**
4. **Practical realization of a menu for a meal or for a day: for persons in good healthand persons having a given pathology**

NTD125: Nursing Practice

Objective:

Content:

1. **History of Nursing :**
    - Evolution of the profession in the world and Cameroon
2. **Concepts and theories in Care:**
    - Study of the healthy human being
    - The human being in his unit and environment, health, diseases, death
    - The various human needs
    - The concept of basic needs. Biological, psychological, sociological components at different stages of life.
    - Manifestation of mental and physical dependence and independence and their causes.
    - The different levels of requirements
    - The different phases of the disease.
    - The various dimensions of care.
    - The cultural attitudes to health and diseas
    - The conceptual model in nursing (V. HENDERSON, D. OREM, C. Roy, Florence Nightingale).
3. **Scientific inquiry in nursing**

Nursing process:

- Stages of the nursing process from model V. HENDERSON
- Data collection
- Analysis and interpretation of data (nursing diagnosis)
- Care planning (formulation of objectives and interventions)
- Implementation of nursing activities
- Evaluation of care activities
- Therapeutic counseling:
- Treatment planning, supervision in the therapeutic relationship
- Personal development and group development in their psychological, emotional, sociological, and educational dimensions.

NTD126: Clinical Internship II

- **Clinical Internship II**

NTD127: Information and Communication Technologies (ICT)I , Civic education and Ethics

- **Information and Communication Technologies I: 3 credit (45 hours); L, T, P, SPW**
    1. Concepts and architecture of computers;
    2. Definitions: computing, information, computer, data, program, software, drivers;
    3. System of enumeration of base 2, the unit of measure of the information and its multiple;
    4. Components of the computer (hardware and software);
    5. Study of an operating system;
    6. The devices (printers, scanner, …);
    7. Study of a text treatment software: Microsoft Word;
    8. Study of a spreadsheet/Microsoft Excel;
    9. Study of a presentation software: Microsoft PowerPoint;
    10. Study of software for the creation and querying databases (Microsoft Access).

- **Civic and moral education: 2 credits (30 hours); L, T**

The Concepts

- The citizen;
- The Nation;
- The State;
- Publics Property and collective's goods;
- The freedoms;
- The public service;
- Ethics;
- Ethics, Law and reason;
- Ethical Problem ;
- Ethics and management.
- Civics
- Deontology
- Moral consciousness
- The universal declaration of Human Rights
- Good governance in public services
- The importance of civics to the life of the nation
- Functions of the state and its citizens
- Deontology, Professional ethics and professionalism
- Relationship between morality, law and ethics
- Codes of ethics

NTD231: Public Health: Epidemiology - Demography and Health Promotion

- **Epidemiology: 2 credit (30 hours); L, T, P, SPW**
    1. Importance of the epidemiology, preventive care
    2. Indices of community health in relation with the epidemiology
    3. Analyticalmethods of demography
    4. Program of investigation in Health
    5. Epidemiological study of acute diseases and chronic conditions
    6. Methodology and Statistics in the field of research
    7. Analysis of the data
    8. Introduction on the insects (brachycères, nematogeres, marangonins, arachnids malacology)

- **Demography: 2 credit (30hours); L, T, P, SPW**
    1. Definition
    2. Purpose
    3. The concepts of demography
    4. The characteristics of the population
    5. Concept of Gender, ratio, increased age pyramid
    6. Stratification of the population
    7. Interpretation
- **Health Promotion: 1 credit (15 hours); L, T, P, SPW**
    - Health Promotion;
    - Definition;
    - Different aspects;
    - Persons likely to participate;
    - The techniques of communications.

NTD232: Metabolic Biochemistry

1. **Bioenergetics**
    - Free energy
    - Standard free energy
    - ATP as a universal currency of free energy
    - NADH and FADH2 as electron carriers
    - Coenzyme A, a universal carrier of acyl groups
    - Extraction of energy from foodstuffs.
2. **Carbohydrates metabolism**
    - Glycolysis
    - Energy yield in glycolysis
    - Citric acid cycle

- Formation of acetyl coA from pyruvate
- Condensation acetyl coA and oxaloacetater
- Isomerization of citrate to issocitrate
- Formation succinyl coA
- Regeneration of oxaloacetate from succinate
- Pyruvate dehydrogenase complex
    - Oxidative phosphorylation
    - The pentose phosphate pathway
- Synthesis of ppp in adipose tissues and muscle
    - Glycogen metabolism
- Cleavage of glycogen
- Role of CAMP inglycogen synthesis and breakdown
- Glycogen metabolism in the liver

3. **Metabolism of lipids**
    - Biosynthesis of phosphoglycerides, sphingolipids and cholesterol
    - Synthesis of steroid hormones from cholesterol
4. **Amino acids Metabolism/HEME biosynthesis**
    - Biosynthesis of amino acids
- Reduction of N_2 to NH_4^+ by nitrogen fixing μ-org
- Assimilation of NH_4^+ into amino acids
    - Synthesis of amino acids from citric acids cycle
    - Regulation of amino acids biosynthesis
- Sequential feedback control
- Enzyme multiplicity
- Concerted feedback control
    - Synthesis of porphyrins
    - Degradation of amino acids
- Oxidative deamination of glutamate
- Deamination of serine and thremine
- Conversion of NH_4^+ into urca
- Conversions of C_3, C_4, and C_5 families
- Degradation of leucine to Acetyl coA

5. **Interconversions between CHO, fat and amine metabolism**
    - Key junctions:
- Glucose – 6 – phosphate
- Pyruvate
- Acetyl coA

6. **Nucleotide synthesis**
    - Nucleotides and Nucleosides
    - Importance of nucleotides in biological system
    - Biosynthesis of purines

- De novo synthesis
- The salvage pathway
    - Inhibitors of purine biosynthesis
    - Control mechanisms on purine biosynthesis
- Feedback inhibition
- Feedback repression
    - Purine degradation
    - Uric acid and hyperricemia disorders
- Lesh-nyhan syndrome
- Gout
- Gout management
    - Pynmidine biosynthesis
- De novo synthesis
- Salvage pathway
    - Inhibitors of pynmidine biosynthesis
    - Control mechanisms in pynmidine biosynthesis
    - Disorders of pyrimidine metabolism
- Orotic aciduria
- Megaloblastic anaemia

7. **Haem biosynthesis**
    - Haem synthesis
    - Disorder in haem catabolism
    - Haem degradation
    - Jaundice
    - Haemoglobin maintenance
    - Sickle cell haemoglobin
    - Porphyria
- Congenital erythropoietic porphyria
- Erythropoietic protoporthyria
- Acute intermittent porhyria
    - Abnormal haemoglobin (haemoglobinopathy)

8. **Photosynthesis**

NTD233: Dietetic Pathophysiology I

Content:

This program has two parts:

- Part A: this concerns diseases or pathological processes for which diet plays a very important role, main role either for prevention or treatment

- Part B: brief but important notions on enteral and parenteral nutrition, diseases or pathological processes which may have a visible and huge impact on nutrition, particular therapies that could have consequences on nutrition.

Endocrine pathologies except that of the endocrine pancreas treated in part A will be treated in part B.

All the pathologies except mentioned will be treated for all ages and all physiological states>.

- Introduction
- Clinical and paraclinical examinations
- Medical file
- Confidentiality

Part A: This concerns diseases or pathological processes for which diet plays a very important role, main role either for prevention or treatment

<u>Oesophagus</u>

Oesophageal cancer

- Gastro-oesophageal reflux-hiatus hernia
- Oesophagitis
- Narrowing of the oesophagus following scaring
- Oesophagealsurgery, complication and scares

Stomach

- Gastro-duodenal ulcers
- Gastritis
- Stomach cancers (tumors)
- Gastric surgery, complications and scares

<u>Small intestine, colon, rectum</u>

- Chronic and acute diarrhea
- Dysentery
- Constipation
- Crohn's disease
- Irritable bowel syndrome and colitis
- Colorectal tumours
- Extended resection of the small intestine (short intestine)
- Surgery of the Small intestine, colon and rectum; indications, complications and scares

Liver- biliary system-pancreas

- Liver cirrhosis
- Tumour of the liver
- Biliary lithiasis
- Pancreatitis
- Tumour of the pancreas

Nutrition diseases

- Pancreatic diabetes
- Hypoglycemia
- Dyslipidaemias, dyslipoproteinaemia
- Obesity
- Wasting and undernutrition

Renal pathologies

- Classification of nephropathies
- Renal failure
- Dialysis and transplantation

Cardiovascular pathologies

- Classification of cardiopathies
- Atherosclerosis and its principal complications
- High blood pressure
- Heart failure

NTD234: Food Microbiology

Content:

1. Basic microbiological techniques: wet preparation and microscopy, gram stain, spore stains, aseptic conditions, isolation, cell counts.
2. Applied microbiology:
    - Sampling techniques applied to milk, meat and meat products, cans, frozen products
    - Control technique applied to milk products.

NTD 235: Dietary Planning

- **Dietary Planning**

Objective: This course is aimed at expanding the approach to the development of dietary reference standards. The new categories of reference values have specific uses and thus are a significant departure from the previous Recommended Dietary Allowances (RDAs) Recommended Nutrient Intakes (RNIs). The focus of this course is to examine the appropriate use of each of the available types of Dietary Reference Intake (DRI) values in planning nutrient intakes of groups and individuals.

Content:

- Introduction to Dietary Planning: What Are Dietary Reference Intakes?, Implementation of Dietary Planning for Individuals and Groups, Caveats Regarding the Use of Dietary Reference Intakes in Dietary Planning and Assessment,

- Using dietary Reference intakes in Planning diets for Individuals: Introduction, Setting Appropriate Nutrient Goals, Planning for Energy Intakes of Individuals and Developing Dietary Plans
- Using Dietary Reference Intakes in Planning Diets For Groups: General Considerations, Overview of Planning for Nutrient Intakes of Groups, Considerations in Planning for a Target Usual Nutrient Intake Distribution, Planning for Energy and Macronutrient Intakes of Groups, Planning Menus to Achieve Target Usual Nutrient Intake Distributions, Planning Interventions to Change the Shape of the Intake Distribution.
- A Theoretical approach using Nutrient Density to plan Diets for Groups: Introduction, Planning for Heterogeneous Groups Using a Comparison of Target Median Nutrient Intake to Mean Energy Intake (or Expenditure), Planning for Heterogeneous Groups Using the Distribution of Nutrient Intakes Expressed as a Density, Technical Considerations of the Nutrient Density Distribution Approach,
- Planning Diets in an Assisted-Living Facility for Senior Citizens,
- Planning Menus for a School Nutrition Program, Planning Diets for a Heterogeneous Group Using a Nutrient Density Approach, Interventions That May Change the Shape of the Intake Distribution: Nutrient Supplementation, Food Fortification.

NTD236 : Clinical Internship III

- **Clinical Internship III**

NTD237 Medical English an Medical French

Objective: To develop communication skills in French and English language and thus enhance patient relationship as needed.

Content:

1. Different parts of the human body
2. Conversation in French and English as specific to health care
3. Translation of Medical Terms, prescriptions, technical and protocol forms, drug dispensation notices
4. Drafting of reports
5. Documentation research
6. Use of data sheets and protocols in the French language.
7. Health structures, premises, equipment, professional categories
8. Drafting of research topics

9. Dissertation on the professional articles
10. Interviews - Speech unto etc. ….
11. Health structures, premises, equipment, professional categories
12. Hospitals
13. The Hardware
14. The staff
15. The Role
16. The pathologies
17. The drugs

- **The pathologies by systems**
  - Urinary system;
  - Cardiovascular System;
  - Digestive system;
  - The endocrine system.
- **The dispensing of drugs**

NTD241 : Public Health II (Environmental Health)

- **Environmental Health: 4 credits (60 hours); L, T, SPW**

1. **Hygiene and Sanitation in the middle**
   - **Personal hygiene**
     - Physical (clothing, cleanliness, sport);
     - Mental (sleep, noise, addiction).
   - **Food Hygiene**
     - Food (balance, conservation);
     - Drinking water (domestic treatment of drinking water);
     - Addiction (tobacco, alcohol, drugs).
   - **Hygiene of the Environment**
     - Habitat (overcrowding, facilities, wastewater, waste);
     - Collective facilities.
2. **HospitaLygiene**
   - Definition;
   - Importance;
   - Purpose;
   - Individual measures;
   - Collective measures Institutional and;
   - The nosocomial infection:

   - Definition;
     - Contributing factors;
     - Plan to Combat (organization of the fight);
     - Hygiene of the patient (toilet, bed linen, etc.);
     - Hygiene of the staff (held, hands);

- Hygiene of care and of the equipment of care (asepsis, antisepsis, decontamination, disinfection, methods and sterilization procedures physical and chemical);
- Specific hygiene in the surgical blocks;
- Remediation of the hospital environment (water, waste, facilities);
- Regulation of the movement of patients and staff in the hospital environment.

NTD242: Food Biochemistry Practical Techniques

Content:

- Extraction technique
- Fractioning and purification techniques
- Characterization techniques
- Titration techniques(dosage) : volumetric methods , polarimetric and colorimetric technique

NTD 243: Dietetic Pathophysiology II

Objective:

Content:

- Pediatric diseases
- Recall on child growth and nutrition
- Dietary mistakes
- Brief knowledge on infant acute dehydration
- Acute diarrhea
- Chronic diarrhea and malabsorption
- Gluten intolerance – mucovisidose
- Disaccharides intolerance (lactose and sucrose)
- Short small intestine
- Constipation-HIRSHSPRUNG disease
- Vomiting
- Pylory stenosis - hiatus hernia - gastro-oesoPWgeal reflux
- Metabolic and nutrition diseases: carbohydrates and proteins
- Vitamin deficiency and vitamin intoxication
- Nephritic syndrome in children
- Renal failure
- Obesity

Geriatrics

Physiopathology and diet of elderly persons

Normal pregnancy and pregnancy pathologies

Evolution of a normal pregnancy, delivery, needs. Pathological processes that could occur during pregnancy; either due to the effect of the pregnancy to the

body; or a preexisting condition prior to pregnancy having an effect on the progress of the pregnancy.Prevention. Breastfeeding: consequence on nutritional needs

NTD244 : Nutritional Needs II

Objective:

Content:

- ✓ Diffrents classes of foods:
  - Proteins,
  - Lipids,
  - Carbohydrates,
  - Vitamins,
  - Minerals,
  - Water,
  - Micronutrients vegetable and fibers.

NTD245: Structural Biochemistry II

1. **Peptides?**
   - Amino acids:
   - Structure and classification
   - Physico chemical properties
   - Analytical methods
   - Peptides:
   - Peptide bonds: chemical and enzymatic hydrolysis
   - Determination of a peptide: composition and sequencing
   - Principal peptides of biological importance: glutathione, peptide hormones
   - Proteins:
   - structure and conformation: protein denaturing
   - structure-function relationship
   - physico chemical properties
   - isolation, fractioning and purification
   - principal protein categories: example and localization
   - Heteroproteins:
   - principal groups: phosphoproteins, lipoproteins, glycoproteins, chromoproteins (hemoglobine and cytochromes)
2. **Nucleotide compounds and nucleic acids :**
   - Nucleotides and nucleotides derivatives: structure and principal nucleotides(AMP , cyclic AMP, ADP, APH)
   - RNA and DNA(structure, properties and cellular localization)

NTD246: Clinical Internship IV

- **Clinical Internship IV**

NTD247: Medical Law and Research Methodology

Content:

- **Labor law: 1 credit (15 hours); L, T, SPW**
  1. Definition of the right of labor, birth and evolution of labor law and sources
  2. The contract of work (conclusion, implementation and rupture)
  3. The conflicts of work (individual and collective)
  4. The delegate of the staff, unions
  5. Work accidents and occupational diseases
  6. The hygiene and safety in the workplace
- **Administrative Law: 1 credit (15 hours); L, T, SPW**

Nature and function of the management of personnel, training and staff development, supervision and evaluation of employees; assessment of jobs and administration of salaries; trade union organizations and labor legislation, collective bargaining, grievance and strikes; administration services to employees. Practical application in industrial administration, public and the hospital.

- **Comon law: 1 credit (15 hours); L, T, SPW**

Society, ethics and the law; the foundation of the right and of the social life; concepts of health and education; place of the body in moral and in law; the right and duties of the individual and

- **Research Methodology**
- **Initiation to research: 3 credit (45 hours); L, T, SPW**
  1. Research in physiotherapy
  2. Sources of knowledge
  3. Methods of reasoning
  4. Stages of the research process (rational, assumptions, literature review, methodology, results/discussion, summary, bibliography)
  5. Classification of research
  6. Establishment of the Questionnaires
  7. Ethics
  8. Preparation and Presentation of Research Reports

NTD351: Ergonomics in the food industry

Objectives:

An introduction to ergonomics affording students the necessary knowledge essential for the psychological and anthropometrical development leading to good design, emphasis is placed on health and safety. At the end of the semester the

student should have the ability to accurately recognize and evaluate hazards (ergonomic in nature) which are likely to cause occupational illnesses or injuries. Design and redesign tasks and workstations to fit in a food industry. Apply the knowledge, skills, and abilities obtained in an industrial based problem.

Content:

- Introduction to Ergonomics, Definition and History of Ergonomics,
- Introduction to Systems Design and Task Analysis
- Musculoskeletal, cardiovascular and nervous system
- Muscle Use and Anthropometry and Workspace Design in a food industry
- Activity-related soft tissue disorders (ASTDs)
- Analysis of Risk of ASTDs in an industry
- Assessing the Risk of Back Injuries in an industry
- Psychosocial and Organizational Aspects of Work within the industry
- Skilled Work, Control-Display Design and Mental Activity; Shift work.

NTD 352 : Molecular Genetics

Content:

- Conservation, transmission and expression of genetic information
- DNA replication
- DNA transcription: notion of genes; mRNA
- Biosynthesis of proteins: the genetic code, protein translation, post translation PWnomenon
- Control of genetic expression
- Application: genetic engineering

NTD353: Management and Economy in nutrition and Dietetics

Content:

1- Company

1-1 definitions and modes of analysis: types, insertion in the economy(branch, sector….etc) using agro food industries and catering for communities(those in good health and those having a given pathology) for application

1-2 fundamental problems in creating a company and its functioning

1-3 a company as a system

2- Company Strategies

2-1 the structure of decision making in a company

2-2 the process of developing company policies

2-3 forecasting and planning of activities

3- **Production System**
   3-1cost (using catering and hospital food services for application)
   3-2principle of budgeting
   3-3notion on the choice and finance of an investment
   3-4information analysis at the level of the company
   3-5pending for interpretation
4- **Man Power and Production**
5- **legislature**
6- **Treatment of information within the production activities.**

NTD354: Food Allergies

Content:

Burns

Brief but important notions on enteral and parenteral nutrition, diseases or pathological processes which may have a visible and huge impact on nutrition, particular therapies that could have consequences on nutrition.

- Enteral nutrition and parenteral nutrition
- Surgery and its nutritional consequences
- Comas, severe infection states, gastrointestinal bleeding and their consequence on nutrition.
- Notions on cancers
- Stomachtology and ENT
- Hepatitis and jaundice
- Hyperuricemia
- Lithiasis
- Nephritic syndrome
- Tuberculosis
- Respiratory distress
- Anemia
- Endocrine pathology
- Iatrogenic pathologies due to laxative, corticoid therapy, antibiotics, chemotherapy, radiotherapy, anti anxiety and depressive…etc
- Rheumatology and bone pathology
- Care of a premature child
- Etat grabataire

NTD355 Family Assessment

- **Family Assessment**

Objective: The objective of this course is to give the students an introduction to family assessment techniques.

Content:

- Introduction to Marital Assessment

- Theories of Attachment
- Divorce Predictors
- The effectiveness of marital therapy
- Couples and Alcohol
- Depression and Psychological Illness
- Domestic Violence
- Introduction to Family Assessment
- Miscellaneous Family Assessment Tools

NTD356: Clinical Internship V

- **Clinical Internship V**

NTD357: Computer for Business

Objective: At the end of the course, student should be able to use computers in daily activities requiring management and other aspects of life.

Content: Computer hardware, software, programming, internet soft wares, analytical packages, genesis, origins, trends and current issues. Hacking.

NTD361: Microbiology II(Virology - Mycology - Immunology)

- **Microbiology II (Virology - Mycology - Immunology): 4 appropriations (60 hours);L, T, SPW**
    1. Characterization and classification of viruses and fungi
    2. Infection, pathogenicity, virulence, exotoxicines and endotoxicines
    3. Immune system: components, mode of action in the face of the antigen, active immunity, passive immunity, allergy

NTD362: Practical food Microbiology and Mycology

Content:

- Different types of bacterial, fungi and parasites that contamine food
- How to prevent contamination
- How to fell food is contamined

NTD363: Enzymology

Content:

- Reaction velocity and catalysis
- Definition and general characteristics of enzymes: classification and principal types
- Enzyme catalysis specificities

- Study of enzymatic reactions: initial velocity, effect of enzyme concentration and substrate concentration on the initial velocity, definition and characteristics of kinetic parameters
- (effector) physical and chemical factors on enzymatic reaction: pH, temperature, activation and inhibition
- Notion of allosteric enzyme
- Coenzymes and hydrosoluble vitamins
- Regulation of enzymatic reaction in a cell
- Interest of enzymes in clinical biochemistry and agro-food industries (enzymatic engineering)

NTD364: Practical Diet Planning and Cooking Techniques

Content:

- Introduction
- Recommended foods for meals, planning a cooking session, general guidance on food, Vegetarian diets, Recipe suggestions regarding and Menu planning and review
- Food hygiene and safety
- Energy and energy balance
- Food labeling
- Oral health, Snacks and drinks, Lunch box ideas and Party food for children
- Food storage
- Food Safety and Sanitation measures using industry standards.
    - The cutting boards are scrupulously clean. Knives are sharp. The toolbox/knife bag is clean and sanitary inside.
    - Sanitizing solution is at the proper strength, not over or underpowered, and whether it's being used as a washing solution instead of sanitizing a pre-washed area.
    - Are the students using towels correctly, for example, not wiping debris off a table and then wiping a knife or a plate with the same towel. Whether students are using their aprons as hand wipes.
    - Products are stored at the correct temperature.
    - Gloves are being used when the last contact with food is occurring, for example, plating up. Sores and cuts are properly treated and covered.
    - Areas are kept sanitized, particularly during meat to vegetable or dairy transitions. Frequent hand washing and sanitizing is suggested.
    - Food Safety and Sanitation is assessed as acceptable or unacceptable. An unacceptable score in this area is considered an overall failure regardless of the total points achieved.

- The student will be in a professional uniform and maintain good personal hygiene.

- Organization skills will be measured using industry standards for the following:
  - Mise en place/organization
  - Develop a written plan
  - Proper utilization of all ingredients
  - Timing of service and follow up
- Cooking Skills and Culinary Techniques will be measured using industry standards for the following:
  - Proper cooking techniques, skills and fundamentals
  - Creativity, Skills and Craftsmanship (knife skills)
  - Portion size
- Taste and Presentation Skills will be measured using industry standards for the following:
  - Overall presentation including the use of appropriate garnishes
  - Overall nutrition balance
  - Ingredient compatibility
  - Flavor, taste, texture and doneness

NTD365: Food Hygiene and Sanitation

➢ **Food Hygiene and Sanitation**

Objective: This course is designed to integrate concepts in chemistry, organic chemistry, and biochemistry, with food processing sanitation and safety operations and understand their role in processing of food.

Content:

- Sanitation Overview
- Sanitary Regulations: GMPs
- Management and Sanitation
- ISO 9000, ISO 14000
- Microorganisms and their Relationship to Sanitation
- Food Contamination Sources
- Hazard Analysis and Critical Control Points (HACCP)
- Food Plant Design and Construction;
- Air Sanitation;
- Equipment for Effective Sanitation,
- Water Sanitation,
- Waste Product Disposal
- Personal Hygiene;
- Cleaning, Sanitizing
- Pest Control;
- Packaging Sanitation

- Food Storage Sanitation;
- Food Transport Sanitation

NTD366: Practical Project

NTD367: Professional Ethics &Deontology

Objective: At the end of the course, the student should be able to know those values and obligations which practice in the profession.

Content: Nurse, Patient, nurse/patient relationship, obligations of the nurse, rights of the patient, rights and responsibilities of the nurse, deontology, ethics, etiquettes, patient reception in hospital, nurse/patient-relative relationship. Medical jurisprudence, lab practice and the law, forensic nursing, malpractice, civic duties, organization of Government, Common law, labour law, Criminal Law,etc.

Health care Ethics

1. Morality and Ethics: Norms, Deviances, Religion, Values, Beliefs, Cultures
2. Bioethics
3. MLS Ethics
4. Moral Development
5. Ethical Principles: Autonomy, Freedom, Privacy, Confidentiality, Beneficence, Fidelity, Motivation, Justice, Veracity and Responsibility.
6. Code of Ethics health workers.
7. Application of Ethics to MLS Practice: Respect For Life And Death, The Concept Of Dignity, Euthanasia, Human Rights, Rights of The Child, Rights of The Elderly, Patients Rights
8. Ethical Decision Making Frameworks and their Application in diagnosis
9. Context And Conflicts With Bioethical Standards

Patient Rights:

1. Respect for life and death, the concept of dignity, euthanasia
2. Care for dying patients: Palliative care, Confidentiality, Professional secrecy, Medical Research and Nursing care ethics.
3. Code of ethics.

- **Health** Employee/employer contract law for health practitioners
- MLS and the law

Introduction to Law and Fundamental Rights

Law

- Sources of law
- Law and enabling Acts (text of application)
- The concept of legal personality
- Civil responsibility (contract, TORT)

- Criminal responsibility
- The court and their jurisdictions
- Labor law: formation and execution of labor contract, remuneration, condition of work, obligation of the employer and employee, termination of labor contracts

Fundamental Rights

- The concepts of human rights
- Sources of human right
- Major international conventions of human rights
- International conventions relating to women
- Children and the rights of the minorities
- The role of the judiciary and the legislative in the protection of human rights
- The Cameroon national commission of human rights and liberties
- The civil society NGO's and the protection of human rights

Law for Medical laboratory personnel

- Definition of Law, public law, private law
- The client's and MLS personnel's' constitutional right
- Administrative law related to licensing and regulation of health practice

Field : MEDICAL AND BIOMEDICAL SCIENCES

Specialty :

HEALTH CARE MANAGEMENT

Field: MEDICAL AND BIOMEDICAL SCIENCES

Specialty: Health care management

1. The objective of the training

The overall goal of the programme is to produce a competent and professional health manager who will improve the health workforce, workplace and health resources for theuse of health care consumers.

2. Required skills

→ **Generic skills**

- Be responsible, reflexive and relational ;
- Have adequate gestures and capacities;
- Develop adequate interpersonal and intrapersonal skills to be able to interact effectively with their patients, entourage and the health team
- Should be trustworthy and reliable;
- Have the capacity for critical thinking, analysis and questioning;
- Develop ethical values of a normal professional;
- Make thoughtful and informed decisions;
- Be able to act with autonomy and responsibility in his area ofcompetence.
- Master the computer tool and ICT

→ **Specific skills**

On successful completion of the programme, the student will have acquired the knowledge, attitudes and skills which will enable them to:

- Apply knowledge and skills from all fields of management, concepts of management and management processes in health care units and services.
- Demonstrate professional accountability, leadership and management abilities in the provision of ethically & legally acceptable managerial functions.
- Provide culturally sensitive, evidence-based and quality health care management to the service or institution using management processes & theories.
- Be able to develop and run projects for the promotion of quality health care.

3. Outlets

- Public Service;
- Private hospitals and clinics;
- NGO (Non-Governmental Organizations);
- Self-employment;
- Medicine of work;

4. Organization of the Teachings

Semester 1

Field : Medical and Biomedical Sciences		Specialty: Health Care Management					
CODE	Courses Titles	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
HCM111	Basic Principles of Administration	30	15	10	5	60	4
HCM112	Social Sciences I: Anthropology and Psychology	60	5	5	5	75	5
Professional Courses 60% (4 UC) 18 credits 270 hours							
HCM113	Financial management for Health institutions I	35	15	5	5	60	4
HCM114	Health Care Delivery Systems I	45	20	5	5	75	5
HCM115	Public Health	30	5	5	5	45	3
HCM116	Hospital/Health services management internship I(Immersion)	/	/	70	20	90	6
TransversalsCourses 10% (1 UC) 3 credits 45 hours							
HCM117	English and French for managers - Information and Communication Technologies 1(ICT)	25	5	10	5	45	3
Total		285	75	12	78	**450**	**30**

Semester 2

Field : Medical and Biomedical Sciences		Specialty: Health Care Management					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
HCM121	Mathematics and Statistics	45	20	5	5	75	5
HCM122	Social Sciences II: Sociology and Social Health	35	15	5	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
HCM123	Principles of Hospital Management	45	20	5	5	75	5
HCM124	Principles of Human Resource Management	30	5	5	5	45	3
HCM125	Applied Administration I	35	10	10	5	60	4
HCM126	Hospital/Health services management internship II (disease control management)	/	/	70	20	90	6
Transversal Courses 10% (1 UC) 3 credits 45 hours							
HCM127	Professional ethics, Civics and Legislation/ICT II	30	6		9	45	3
Total		**235**	**56**	**94**	**65**	**450**	**30**

Semester 3

Field : Medical and Biomedical Sciences		Specialty: Health Care Management					
Code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
HCM231	Health Care Informatics and Statistics	45	20	5	5	75	5
HCM232	Labour Law and Insurance for Workers	35	15	5	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
HCM233	Health Policy	35	15	5	5	60	4
HCM234	Health Care Delivery Systems II	35	15	5	5	60	4
HCM235	Applied Administration II	35	15	5	5	60	4
HCM236	Hospital / Health Services Management Internship III(human resources management)	/	/	70	20	90	6
Transversal Courses 10% (1 UC) 3 credits 45 hours							
HCM237	Management Communication	30	5	5	5	45	3
Total		**230**	**65**	**93**	**62**	**450**	**30**

Semester 4

Field : MEDICAL AND BIOMEDICAL SCIENCES		Specialty: Health Care Management					
Eu code	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
HCM241	Concurrent Experience(field experience)	35	15	5	5	60	4
HCM242	Biomedical Statistics	45	20	5	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
HCM243	Health Care Reforms and the Future of the Cameroon Health System	45	20	5	5	75	5
HCM244	Human Resource Management II	35	15	5	5	60	4
HCM245	Financial Management for Health Institutions II	25	10	5	5	45	3
HCM246	Hospital / Health Services Management Internship IV(logistics and equipments)	/	/	70	20	90	6
Transversal Courses 10% (1 UC) 3 credits 45 hours							
HCM247	Operational Research II Health Information Systems	25	10	5	5	45	3
Total		**227**	**70**	**100**	**53**	**450**	**30**

Semester 5

Field : Medical and Biomedical Sciences		Specialty: Health Care Management					
CODE	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
HCM351	Project Management And Development	35	15	5	5	60	4
HCM352	Stress Management /Guidance /Counselling	50	15	5	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
HCM353	Research In Health Care (Research Techniques)	35	15	5	5	60	4
HCM354	Civics and Currents Events	35	15	5	5	60	4
HCM355	Management and Economics of Medical Devices Equipments	35	15	5	5	60	4
HCM356	Hospital / Health Services Management Internship V(Financial management)	/	/	70	20	90	6
Transversal Courses 10% (1 UC) 3 credits 45 hours							
HCM357	Medical Law, Legal and Occupational Health	30	7	0	8	45	3
Total		**190**	**37**	**180**	**43**	**450**	**30**

Semester 6

Field : Medical and Biomedical Sciences		Specialty: Health Care Management					
CODE	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
HCM361	Property Management	50	18	3	13	90	6
HCM362	Financial Management	30	6	0	9	45	3
Professional courses 60% (4 UC) 18 credits 270 hours							
HCM363	Internship in General Administration	10	5	40	5	60	4
HCM364	Internship in Human Resource Management	10	5	40	5	60	4
HCM365	Internship in Project Management Development	10	5	40	5	60	4
HCM366	Research Project	0	0	90	0	90	6
Transversal Courses 10% (1 UC) 3 credits 45 hours							
HCM367	Professional Ethics and Deontology	30	7	0	8	45	3
Total		**196**	**49**	**153**	**52**	**450**	**30**

5. Courses content

HCM111: Basic Principles of Administration

Objective: At the end of this course, the student should have understand the basic rules of administration in general and all health unit, facility and institution or sector

Content: Introduction to administration, terms in administration, hospital administration, material administration and personnel administration. Theories and principles of administration, Henri Fayol, mayol, Maslow etc. Lessons and applicabilities in health care management at unit. Institution, facility or sector.

HCM112: Social Sciences I: Anthropology and Psychology

Objective:

Content:

- Introduction to Psychology
- The main stages of life: Affective, intellectual, psychomotor and psychosocial development of the human being
- First age, second age, pre-school age adolescence, adulthood and ageing
- Human body: Body diagram and body image
- The dynamic aspects of the human personality: unconscious, impulse, suppression and motivation
- Defense and adaptation mechanisms
- Affective states: Feeling, emotions, fear, anger, distrust and anxiety
- Conduct and behavior
- Different types of relationships: Social, educative, collaborative, authoritative, dependence, submissive and motherly
- Nurse-patient relationship: specificities
- Introduction to sociology
- Notions of anthropology and ethnology
- Evolution of man and life: Biological, psychological and social dimensions
- Culture and cultural PWnomena
- The in-born and the acquired: Myths and beliefs
- Cultural attitudes toward health, illness and deaths
- Present and alternative past Medical Practices and Traditional medicine
- Sociology and social psychology
- Notions of groups, restricted groups
- Dynamics: Conflict dynamics: Leaders, communication and communication networks

HCM113: Financial management for health institutions I

Objective: At the end of the course, the student should be able to identify the funding means utilized by health care managers and source funding for such

Content: Definitions, purposes of financing, sources of financing, government policies on financing, reasons for financing, types of financing, historical perspectives of financial, social action in financing, and concepts of health care financing. Applicabilities in a developing context.

HCM114: Health Care Delivery Systems I

Objective: At the end of this course, the should be able to list and outline the health care delivery systems of many countries of the world in order to use their experiences in better management of health care

Content: compare the different health systems of the world from the, USA, Europe, Asia, South America and Africa

HCM115: Public Health

Objective: At the end of the course, student should be able understand health policies, assess the need for such policies and assessed its implementation.

Content: the reasons for preventive health strategies, curative health strategies, community sensitization strategies, hygiene and sanitation strategies etc and their implementation

HCM116: Hospital / Health service management internship I

Objective:

Content: Management styles in health units, service, institution, facility, hospital-public and private, report writing, post internship reports and viva

HCM117: English and French for Managers / ICT

- **Bilingual training 1: 1 credit (15 hours); L, T, P, SPW**

French expression

1. **Form of words in French**

   Prefix □, radical; □ Root, suffix.

2. **Explanation of words and group of words**
3. **Morphosyntax and rhetoric**
   - Components and structure of the sentence:
     - Simple sentence;
     - Complex sentence;
     - Composed sentence.
   - Figures of style:

- Figures of analogy;
- Figures of amplification;
- Figures of opposition;
- Figures of mitigation.

4. **Administrative and professional correspondence**
    - The different parts of a administrative correspondence and the administrative style;
    - Professional Correspondence:
        - Note of service;
        - Record (activity, mission);
        - The report (activity, mission).
5. **Professional correspondence to individual dominance**
    - Application for employment;
    - CV;
    - Letter of motivation.
6. **Methodological Considerations on the written exercises**
    - French composition;
    - Contraction of text:
        - French composition: Reminder methodological and implementation;
        - Contraction of text: methodological reminder and application.
7. **Study of the communication situations.**
    - Identification of the factors in the situation of communication (transmitter, receiver, code, channel, message, context);
    - Situation of communication and verbal interactions;
    - Study of the elements para verbal cues (kinesthetic, proxemics, MIMO-gestural, etc.;
    - Identification and handling of figures of expression and thought metaphors, irony. Satire, parody, etc.); □ etc.
8. **Oral communication**

➢ **Techniques of Information and the communication 1**

1. Concepts and architecture of computers
2. Definitions: computing, information, computer, data, program, software, drivers
3. System of enumeration of base 2, the unit of measure of the information and its multiple
4. Components of the computer (hardware and software)
5. Study of an operating system

6. The devices (printers, scanner, …)
7. Study of a text treatment software: Microsoft Word

HCM121: Mathematics and Statistics

Objective: At the end of the course, the student should be able to do mathematical and statistical calculations in resolving issues of data

Content: Counting, manual calculations, computer assisted calculations, national health statistics, storage and retrivial systems etc

HCM 122: Social Sciences II: Sociology and Social Health

Objective: At the end of the internship, student should be able to understand the different aspects of social health and how different communities look at issues concerning health based on their societal norms.

Content: Evaluate the social beliefs and their impacts on the health of the people and propose solutions to resolving the negative effects of social beliefs on the health of the community.

HCM123: Principles of Hospital Management

Objective: At the end of this course, the student should be able to manage the three Ms (material, manpower and money resources) of a hospital in effective, efficient and economic manner

Content: Resources in hospital management and management in general:
The functions of all units in the hospital are clearly spelt out. (Nursing, medical and drug, devices, information statistic, financial and accounting human resources etc)
Benefits, rights, duties, functions, deeds and miss-deeds of the money, material and manpower.

HCM124: Principles of Human Resource Management

Objectives: At the end of this course, students should be able to manage manpower resources in any health setting.

Content: Definitions- resources, resources in management, human beings and work place, personnel management. Strengths, required in personnel management, unforeseen weaknesses, possible opportunities, threat avenues, and possible success stories

HCM125: Applied Administration I

Objective: At the end of this course, the student should be able to apply the principles of administration in all health unit, facility and institution or sector. The students will be drilled on handling complains, resolving conflicts, the respect of hierarchy by different level staff without prejudice.

Content: Application of the Theories and principles of administration, Henri Fayol, mayol, Maslow etc. Lessons and applicabilities in health care management at unit. Institution, facility or sector.

HCM126: Hospital/Health Services Management Internship II (Disease control management)

Objectives: At the end of the internship, student should be able to demonstrate skills in health care management at various levels of health care in the hospital.

Content: Management styles in health units, service, institution, facility, hospital-public and private, report writing, post internship reports and viva.

HCM127: Professional ethics, Civics and Legislation/ICT II

Objective: At the end of the course, the student should use ethical values in health care decisions, use the civic and legal responsibilities in the execution of daily functions

Content: Professionalism and ethics of health care, responsibility, autonomy, rights of health care consumers, rights of health care providers, the Cameroon legal system, civic responsibilities, the place of the law in health care management, medical jurisprudence, malpractice and negligence. Knowledge on Crimes that may occur at work and how to determine them

- **Technique of information and communication 2**

1. Creation of a simple database with a spreadsheet (How to Give a name to a cell range)
2. Validation of Data in a range of cells on a spreadsheet
3. Creation of the statistical tables simple (modality, workforce, frequency) and automatic filling with functions such as NB, NB.If and NB.If.ENS, Average, Sum, if
4. Creation of graphics from statistical tables
5. Presentation and use of a statistical software (ex: Epi Info)
6. Creation of a questionnaire on EPI info or other
7. Data entry and analysis
8. Definition of the concepts of the computer network
9. Presentation of the types of media and networks
10. Presentation of Internet (Connection, research, download)
11. Networks withoutwires
12. Learning of a software application
13. Numbering system
14. Computer Security: Virus and antivirus

HCM231: Health Care Informatics and Statistics

Objective: Student should understand the different goals of health information analyse the information, interpret it with the use statistical packages

Content: Definition and goals, Statistic elements: units, population, samples, Statistic sources, Statistic calculation, The health information process, Data collection, collection media, forwarding, Treatment(counting, regrouping, presentation),Analysis and interpretation, Feedback and decision making

HCM232: Labour Law and Insurance for workers

Objective: At the end of this course, they should be able to understand rationale of labour law, nationally and internationally and give the generalities. Linking workers insurance to the treatment of workers.

Content: Understand the dictates and proposals of the international labour organization; understand the labour law and workers insurance of Cameroon.

HCM233: Health Policy

Objective: At the end of this course, the student should be able to understand the process of policy formulation and the different stages involve.

Content: the reasons for preventive health strategies, curative health strategies, community sensitization strategies, hygiene and sanitation strategies etc and their implementation, haven understood the processes and levels, critically analyze different health policies. And assess their implementation.

HCM234: Health Care Delivery Systems II

Objective: At the end of this course, the student should be able to analyze the current health care systems in relation to the health policies of various countries.

Content: Pick out the leading health systems of the world and determine the reason behind their successes. Make reconditions for other countries based on their particular policies.

HCM 235: Applied Administration II

Objective: At the end of this course, the student should be able to apply the principles of administration in all health unit, facility and institution or sector. The students will be drilled on handling complains, resolving conflicts, the respect of hierarchy by different level staff without prejudice.

Content: Application of the Theories and principles of administration, henri Fayol, mayol, Maslow etc. Lessons and applicabilities in health care management at unit. Institution, facility or sector.

HCM236: Hospital/health services management internship III (Human resources Management)

Objective: At the end of the internship, student should be able to demonstrate skills in health care management at various levels of health care in the hospital.

Content: Management styles in health units, service, institution, facility, hospital-public and private, report writing, post internship reports and viva.

HCM237: Professional Ethics and DeontologyManagement Communication

Objective: At the end of the course, the student should be able to understand the steps in project, management and development. Be able to assess an a completed project and develop projects for the health unit, institution, service or facility for better improvement

Content: Projects within a health facility, institution, unit, service or facility, developing new projects, health care needs for project development, process of proposal writing, planning for a project development, assess progress, evaluating progress

HCM241: Concurrent Experience(field experience)

Objective: At the end of the experience (academic visits different health organizations), the student should be able to report success stories of health care management in various health care organizations, outline difficulties and challenges of each

Content: Analysis of health management successes, weaknesses, opportunities, threats, and strengths of health units, institutions, units, facility, hospital etc…

HCM242: Biomedical Statistics

Objective: To summarize, analyze, present and interpret health statistical information.

Content:

- Variables (Qualitative and quantitative) ;
- Presentation of data: bar charts, pie diagrams, histograms and tables, frequency and frequency distribution;
- Summarization of quantitative and qualitative data: mean, median and mode, standard deviations and standard errors, proportions etc;
- The concept and principles of significance tests and confidence intervals;
- Statistical testing and inference: The normal distribution and t-distribution, Chi squared test, Poison's distribution, non parametric tests etc;
- Sampling;
- Errors in statistics.

HCM 243: Health Care Reforms and the Future of Cameroon Health System

Objective: At the end of the internship, student should be able to clearly bring out the classification of the Cameroon health sector, trace the reforms put in place, analyze these reforms and projects for the future.

Content: situate the Cameroon health system in the context of the world, critically analyze each reform- the strengths and weaknesses. Propose future innovations which are long lasting.

HCM244: Human Resource Management II

Objective: At the end of this course, students should be able to manage manpower resources in any health setting with specific details depending on the type of organization=NGO offering Preventive Care services, hospitals, curative services etc.

Content: Details on the selection recruitment, job specification and analysis, job evaluation. Methods and types. Wage determination and bonuses and allowances. Type of contracts

HCM245: Financial Management for Health Institutions II

Objective: At the end of the course, the student should be able to manage all financial resources in the health care management institution to improve on general health.Calculate the financial accounts of the different units of the hospital weekly moNTDly and annually.

Content: Money, uses and disadvantages. Overcoming financial difficulties, life without soft loan-definitions, advantages, disadvantages, benefits, and complications to man and the general state of money, materials and manpower in financial executions.For each unit revenue collector, consultation, pharmacy, laboratory, the different calculations are mastered. Finally the budget of the hospital is determined.

HCM246: Hospital/Health Services Management Internship IV (logistics and equipment)

Objective:

Content: Management styles in health units, service, institution, facility, hospital-public and private, report writing, post internship reports and viva

HCM247: Operational Research II / Health Information System

- **Initiation to research:**

1. In Health Research
2. Sources of Knowledge

3. Methods of Reasoning
4. Stages of the research process (rational, assumptions, literature review, methodology, results/discussion, summary, bibliography)
5. Classification of research
6. Establishment of the Questionnaires
7. Ethics
8. Preparation and Presentation of Research Reports
9. Case practice: drafting of protocols of research

- **Construction of a Research proposal**: **Background:** Literature review, formulating the problem statements, justification of studies, objectives, framing the questions according to general and specific objectives; is developing a testable hypothesis to achieve the objectives for quantitative research selection, referencing, etc.; Ethical considerations; Work plan: personnel; timetable project administration; Plans for dissemination.

- **Health Information System**

Objective: The main objective of this course is to enable the student to be able to:

Collect, summarize, analyze and present health information from an individual patient and community, in a manner that it can be useful in taking important decisions on individual patients and on the community and the health system.

Content:

- Definition and goals;
- Statistical elements: units, populations, samples;
- Statistical sources; statistical calculations;
- The Health Information Process;
- Data collection, collection media, forwarding, treatment;
- Analysis and interpretation; feedback and decision taking;
- Computerization of Health information;
- Role of health information in health care management.

HCM351: Project Management and Development

Objective: At the end of the course, the student should be able to understand the steps in project, management and development. Be able to assess an a completed project and develop projects for the health unit, institution, service or facility for better improvement

Content: Projects within a health facility, institution, unit, service or facility, developing new projects, health care needs for project development, process of

proposal writing, planning for a project development, assess progress, evaluating progress

HCM352: Stress management and guidance and counseling

Objective: At the end of the course, the student should be able to make the workplace stress free for its members- providers and consumers. At the end of the course, the student should also be able identify areas of stress and conflicts requiring guidance and counseling.

Content: Physical. Psychological, spiritual, and emotional management of personnel and consumers at workplace, guidance and counseling, conflicts and conflict resolutions. The process of guidance, obstacles to guidance, counseling processes, obstacles of counseling, individual counseling, group counseling, personal health care management, group health care management.

HCM353: Doing Research in health care (Research Techniques in Health)

Objective: At the end of the course, students should understand research process and attempt at research

Content: The research process, sources of data, introduction in research, background to studies, the research problem, objectives, questions, hypothesis, purpose, significance, literature review, research methodology-designs, populations, sample and sampling, instruments, validation processes, ethical issues, results and methods of presentation, statistical analysis, tests of significances, discussion, conclusion and recommendations. Referencing and referencing styles.

HCM354: Civics and Currents events

Objective: At the end of the course, students should understand their civic duties. Differentiates between citizen's rights, privileges and duties. Have a general knowledge on the Cameroon government and regime. Have Knowledge on current happenings of the world.

Content: Be able to witness a situate and decide who is right or wrong depending on their knowledge of citizens' rights, privileges and duties. Explain happenings within the Cameroon government and the world at large

HCM355: Management and Economics of Medical Devices Equipments

Objective: At the end of the course, students should know the different medical devices and their uses, know how to management while in use.

Content: know the different uses of the devices, how to keep them functioning in good quality, when to replace or repair them.

HCM356: Hospital/Health Services Management Internship V(Financial management)

Objective: At the end of this course, the student should be able to manage the three Ms (material, manpower and money resources) of a hospital in effective, efficient and economic manner

Content: Resources in hospital management and management in general:
The functions of all units in the hospital are clearly spelt out. (Nursing, medical and drug, devices, information statistic, financial and accounting human resources etc)
Benefits, rights, duties, functions, deeds and miss-deeds of the money, material and manpower.

HCM357: Medical law, Legal and Occupationnal health

- **Labor law: 1 credit (15 hours); L, T, SPW**

1. Definition of the right of labor, birth and evolution of labor law and sources
2. The contract of work (conclusion, implementation and rupture)
3. The conflicts of work (individual and collective)
4. The delegate of the staff, unions
5. Work accidents and occupational diseases
6. The hygiene and safety in the workplace

- **Administrative Law: 1 credit (15 hours); L, T, SPW**

Nature and function of the management of personnel, training and staff development, supervision and evaluation of employees; assessment of jobs and administration of salaries; trade union organizations and labor legislation, collective bargaining, grievance and strikes; administration services to employees. Practical application in industrial administration, public and the hospital.

- **Civil law: 1 credit (15 hours); L, T, SPW**

Society, ethics and the law; the foundation of the right and of the social life; concepts of health and education; place of the body in moral and in law; the right and duties of the individual and of the Community (right of patients, the rights of the person and the health care system); privatization and publicisation of health, respect for private life and social cost of health. Autonomy, participation, etc.

HCM361: Property Management

Objective: This course focuses on a broad overview of key topics related to the property management profession. The topics covered include how to increase property values by creating strategies to maximize return by providing excellent customer service and using the "progressive tenants as customer" approach, managing the day-to-day operations of properties effectively, the importance of

financial analysis to the strategic decision-making process, the strategic role property managers play in facilities management, and an overview of community impact assessment, including the benefits of conducting such an assessment. It also provides general guidelines for conducting a community impact assessment, including types of impacts that should be addressed during the process and related issues.

Content:

- Introduction;
  - Property as an Asset;
  - Role of the Property Manager
- ***Residential Property: Owner and Tenant Relations***
  - Commercial Property and Shopping Centers;
  - Unit Titles;
  - Test feedback
- ***Residential, Office and Retail Properties***
  - Corporate Real Estate;
  - Public Sector Real Estate;
  - Workplace Strategy
  - Social Housing Ethics & Compliance
- ***Leases, Maintenance and Construction***
  - Financial Management and Information Systems
  - Disasters;
  - Insurance;
  - Sustainability
  - Building Act;
  - Maintenance;
  - Inspection;
  - Health & Safety
  - Facilities Management;
  - Laws & Risk and Environmental Issues.

HCM362: Financial management

Objective:

This is an introductory course in finance that focuses on the practical aspects of corporate finance. Topics covered include the mathematics of finance, security valuation, investment and financing decisions, risk and return tradeoff, and the fundamentals of international financial management. The goal is to equip students with the basic skills that will be supplemented and extended in other fields of study.

Content:

- Statistical tools necessary to financial management, Financial tools risk, return and cost of capital
- Time value of money
- Basic concepts of financial management and financial environment
- Analysis of financial ratios and Analysis of cash flows
- Cost of different types of funding (calculation of the weighted average cost of capital, WACC)
- Capital investment analysis methods
- Capital investment and risk
- Break-even analysis and operating leverage Financial leverage Capital structure
- Valuation of securities
- Long-term investment decisions
- Short-term financing decisions
- Risk management and international financial management.

HCM363: Internship in General Administration

Objective: At the end of the internship, student should be able to demonstrate skills in General Administration and health care administration at various levels of health care in the hospital /organizations

Content: Management styles in health units, service, institution, facility, hospital-public and private, report writing, post internship reports and viva.

HCM364: Internship in Human Resource Management

Objective: At the end of the internship, student should be able to demonstrate skills in human resource management at the hospital and other health care organizations.

Content: Management the human resources in health units, service, institution, facility, hospital-public and private, report writing, post internship reports and viva. Aspects like contracting, performance, remuneration, bonuses are carefully carried out.

HCM365: Internship in Project Management and Development.

Objective: At the end of the internship, student should be able to demonstrate skills in financial Project management and development in health.

Content: Understanding the rules of project management and development, understand the various stages. Develop sample projects and elaborately show the various stages. Assess any running project by the health unit at the time and write a report at the level on which it is.

HCM366: Research Project

Objective: At the end of the course, the students should be able carry out some research on a health care management topic

Content: Selection of topic, presentation of proposal for research, carrying out the research and reporting it.

HCM367: Professional Ethic and Deontology

- **Ethics and Professional Deontology: 3 credits (45 hours); L, T, SPW**
    1. Theoretical Bases of the ethics and the deontology
    2. Philosophical Foundations of medical ethics and care
    3. Values, beliefs, cultures, religions, standards, deviances
    4. Respect for life and death, the concept of dignity, euthanasia, confidentiality
    5. The professional secrecy
    6. Ethics in the daily practice of care (case study from professional experience)
    7. Right to the man
    8. The right of the Child (child abuse)
    9. The right of elderly persons, the Sick
    10. Accompaniments of dying (palliative care)
    11. The ethics of medical research and care, case study
    12. Code of deontology of personal medico-sanitary.

Field : MEDICAL AND BIOMEDICAL SCIENCES

Specialty :

HEALTH SANITARY INSPECTOR

Field: MEDICAL AND BIOMEDICAL SCIENCES

Specialty: Health sanitary Inspector

1. **The objective of the training**

The mission of HSI program is to train highly qualified Health Sanitary Inspectors capable of inspecting, evaluating and planning high quality healthy environment in diverse settings locally, nationally and internationally.

2. **The powers sought**

→ **Generic Skills**

- Be responsible and reflexive;
- Have empowered gestural and capabilities; relational
- Recognize its emotions and be able to use with the acquired professional necessary;
- Have a trust and a proven insurance;
- Have the critical capacity and questioning;
- Develop an ethics and a normal professional;
- Make thoughtful decisions;
- Act with autonomy and responsibility in the fields of well delimited its function;
- Master the computer tool and ICT.

→ **Specific skills**

- Inspects community land areas and investigates complaints concerning neglect of property and illegal dumping of refuse to ensure compliance with municipal code: Inspects designated areas periodically for evidence of neglect, excessive litter, and presence of unsightly or hazardous refuse;
- Interviews residents and inspects area to investigate reports of illegal dumping and neglected land;
- Locates property owners to explain nature of inspection and investigation findings and to encourage voluntary action to resolve problems;
- Studies laws and statutes in municipal code to determine specific nature of code violation and type of action to be taken;
- Issues notices of violation to land owners not complying with request for voluntary correction of problems;
- Issues notices of abatement to known violators of dumping regulations and informs other municipal agencies of need to post signs forbidding illegal dumping at designated sites;

- Prepares case materials when legal action is required to solve problems;
- Conducts informational meetings for residents, organizes neighborhood cleanup projects, and participates in campaigns to beautify city to promote community interest in eliminating dangerous and unsightly land use practices.

3. OUTLETS

- Health and sanitation departments of Municipal Bodies
- District Councils
- Transportation services (Railways, seaports, airports…)
- Hotels
- Food industries.

4. Organization of the Teachings

Semester 1

Field : Medical and Biomedical Sciences		**Specialty: Health Sanitary Inspector**					
Code	**Courses Titles**	**Hourly Volume**					**Number of Credits**
		L	**T**	**P**	**SPW**	**Total**	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
HSI 111	Anatomy-Physiology I /Cell Biology - Histology	45	20	5	5	60	4
HSI 112	Microbiology I : Bacteriology-Parasitology /General Chemistry & Biochemistry	35	15	5	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
HSI 113	Fundamentals of Nursing I : Overview-Concepts-History-Theories	35	15	5	5	60	4
HSI 114	Social Sciences I : Medical Sociology, Anthropology & Psychology	45	20	5	5	75	5
HSI 115	Fundamentals of Nursing II: Human Development Across The Life Span	30	5	5	5	45	3
HSI 116	Field Placement I(immersion in hospital)	/	/	70	20	90	6
Transversals courses 10% (1 UC) 3 credits 45 hours							
HSI 117	Bilingual training	25	5	10	5	45	3
Total		**285**	**75**	**12**	**78**	**450**	**30**

Semester 2

Field : Medical and Biomedical Sciences		Specialty: Health Sanitary Inspector					
Code	Courses Titles	Hourly Volume					Number of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
HSI 121	Anatomy-Physiology II	45	20	5	5	75	5
HSI 122	Microbiology II: Virology-Mycology-Immunology	35	15	5	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
HSI 123	Fundamentals Of Nursing III: Nursing Sciences and First Aid	45	20	5	5	75	5
HSI 124	Public Health: Epidemiology-Demography-Environmental Sanitation & Health Promotion	30	5	5	5	45	3
HSI 125	Medical Nursing I	35	10	10	5	60	4
HSI 126	Field Placement II (immersion in district council)	/	/	70	20	90	6
Transversalscourses 10% (1 UC) 3 credits 45 hours							
HSI 127	Civics and Ethics – ICT	30	6		9	45	3
Total		**235**	**56**	**94**	**65**	**450**	**30**

Semester 3

Field : Medical and Biomedical Sciences		Specialty: Health Sanitary Inspector					
code	Courses Titles	Hourly Volume					Number OfCredits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
HSI 231	Food & Nutrition	45	20	5	5	75	5
HSI 232	General Safety, Occupational Health And Hygiene	35	15	5	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
HSI 233	Water and Air Sanitation	55	10	20	5	90	6
HSI 234	Noise Pollution & Management	25	10	5	5	45	3
HSI 235	Personal Hygiene	25	10	5	5	45	3
HSI 236	Field Placement III(Food and water industries/ Market)	/	/	70	20	90	6
Transversalscourses 10% (1 UC) 3 credits 45 hours							
HSI 237	- French and English for Medical Profession II - ICT I	30	5	5	5	45	3
Total		**230**	**65**	**93**	**62**	**450**	**30**

Semester 4

Field : Medical and Biomedical Sciences		Specialty: Health Sanitary Inspector					
Code	Courses Titles	Hourly Volume					Number OfCredits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
HSI 241	Health Education & Communication	35	15	5	5	60	4
HSI 242	Behavioral Science, Complimentary & Alternative Medicine	45	20	5	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
HSI 243	Biotechnological Applications For Environmental Protection	45	20	5	5	75	5
HSI 244	Night Soil Disposal	35	15	5	5	60	4
HSI 245	Soil Sanitation	25	10	5	5	60	3
HSI 246	Field Placement IV (Hostel and dormitories) Introduction to Operational Research	/	/	70	20	90	6
Transversalscourses 10% (1 UC) 3 credits 45 hours							
HSI 247	Research methodology, Biostatistics Health Information Systems	25	10	5	5	45	3
Total		**227**	**70**	**100**	**53**	**450**	**30**

Semester 5

Field : Medical and Biomedical Sciences		Specialty: Health Sanitary Inspector					
CODE	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental Courses 30% (2 UC) 9 credits 135 hours							
HSI 351	Built Environment	35	15	5	5	60	4
HSI 352	Occupational Health And Health Care Management	50	15	5	5	75	5
Professional courses 60% (4 UC) 18 credits 270 hours							
HSI 353	Burial And Cremation Ground And Mass Casualty Disposal	35	15	5	5	60	4
HSI 354	Control of Biological Environment	35	15	5	5	60	4
HSI 355	Sanitation Measures in Fairs, Festivals and Natural calamities-Mass Casualty Disposal	35	15	5	5	60	4
HSI 356	Field Placement V (refugee camp or prison)	/	/	70	20	90	6
Transversalscourses 10% (1 UC) 3 credits 45 hours							
HSI 357	Medical Law, Legal and Occupational Health	30	5	5	5	45	3
Total		**190**	**37**	**180**	**43**	**450**	**30**

Semester 6

Field : Medical and Biomedical Sciences		Specialty: Health Sanitary Inspector					
CODE	Courses Titles	Hourly Volume					Number Of Credits
		L	T	P	SPW	Total	
Fundamental courses 30% (2 UC) 9 credits 135 hours							
HSI 361	Communicable and Non-Communicable Diseases- Health Economics	40	15	15	5	75	5
HSI 362	Family Assessment and Food Hygiene and Sanitation	35	15	5	5	60	4
Professional courses 60% (4 UC) 18 credits 270 hours							
HSI 363	Public Health Administration	35	15	5	5	60	4
HSI 364	Project Management	35	16	4	5	60	4
HSI 365	Global Health	35	16	4	5	60	4
HSI 366	Field Placement VI(determined by title of project)	/	/	70	20	90	6
Transversals courses 10% (1 UC) 3 credits 45 hours							
HSI 367	Professional Ethics and Deontology	25	10	5	5	45	3
Total		**196**	**49**	**153**	**52**	**450**	**30**

5. **Courses content**

HSI111: Anatomy and Physiology I / Cell Biology -Histology

- **Anatomy Physiology -1: 3 credits (45 hours); L, T, P, SPW**

1. **Nervous System**
   - The organization of the nervous system: central nervous system, periPWral nervous system, autonomic nervous system (the systems parasympathetic and sympathetic);
   - The structure of the nervous tissue;
   - The nerve endings; - the operation of neurons; - the reflexes.
2. **The Endocrine System**
   - The hormones;
   - Thyroid and parathyroid glands;
   - The pituitary and hypothalamus;
   - The adrenal glands;
   - The pancreas.
3. **Organ of meaning**
   - The eye: the view;
   - The ear: hearing and balance;
   - The sense of smell;
   - The taste;
   - The touch.

HSI112: Microbiology I : Bacteriology – Parasitology, General Chemistry andBiochemistry

- **Microbiology I: Bacteriology-Parasitology**

Objectives:

This course is designed to give a basic understanding of microorganism. Upon successful completion of the course, the student should be able to:-

- Have a general notion of Microorganisms
- Know the useful and harmful effects of microbes to humans
- Differentiate prokaryotes from Eukaryotes
- Perform Preliminary basic laboratory techniques for identifying Microorganisms

Content:

- General introduction to Microbiology
- Importance of Microbes
- Cell types: Prokaryotes and Eukaryotes
- History of Development of MCB

- Structure and Function of a Composite Bacteria cell
- Classification and Identification of Microorganisms
- Criteria used for classification of Microorganisms

Parasitology:

Introduction to Parasitology

- Definition of some terminologies used in Parasitology
- Transmission and diseases caused by parasites
- Classification and characteristics of parasites
- Life cycles of some parasites (aetiologic agent, mode of transmission, infective and diagnostic stages)e.gEntamoeba histolytica, Giardia lamblia, Trichomonas vaginalis, Leishmaniaspp, Trypanosoma spp, Malaria parasite,Ascarislumbricoides, Hookworms, Taeniaspp, Schistosoma spp
- Quality assurance in the Parasitology laboratory
- Basic techniques used in the identification of parasites

Introduction to the laboratory

- levels of laboratories
- laboratory safety
- First Aid in the laboratory

Introduction to Haematology

- Overview
- Red blood cell Indices
- White blood cell Indices
- Blood groups and Transfusion
- ABO blood group system
- Rhesus Factor
- Erythrocyte Sedimentation rate

Introduction to Medical Parasitology

- Definition of basic terminologies in Parasitology
- Host/ Parasite Interactions
- Routine stool examination
- Examination of Malaria parasite

Introduction to Clinical Chemistry

- Specimen collection and processing
- Explanation of clinical Chemistry results: Blood sugar, heart disease risk, Iron status, Kidney Function tests, Electrolytes, Acid-base balance, Bone metabolism, Lipid panel, Liver Function tests, Cancer screening, Thyroid function and Urinalysis

Introduction to Bacteriology

- Bacterial structure
- Bacteria cell shape and arrangement

- Laboratory diagnosis of gonorrhoeae
- Laboratory diagnosis of tuberculosis
- Laboratory diagnosis of Urinary Tract Infections
- Laboratory examination of V/S and U/S

- **General Chemistry & Biochemistry**

Objective: The student should be able to; describe the role of chemistry in modern life; define some of the physical properties of drugs, e.g., solubility, melting point, boiling point and acid–base properties; explain the terms pH, P^{ka}, buffer and neutralization.

Atomic structure and bonding: Describe the fundamental concepts of atomic structure; explain various aspects of chemical bonding; discuss the relevance of chemical bonding in drug molecules and drug–receptor interactions.

Content: Physical Chemistry

- **General Introduction**: Role of chemistry in modern life.
- **Atomic Structure:** Orbitals and electronic configurations
  - Aufbau principle.
  - Pauli exclusion principle
  - Hund's rule
  - Hybridization
- **Atomic Structure and Bonding**
  - Describe the fundamental concepts of atomic structure.
  - Explain various types of chemical bonding.
  - Electronegativity and chemical bonding
  - Bond polarity and intermolecular forces.
  - Understand the significance of chemical bonding in drug-receptor interactions.
- **General Review of the Periodic Table**
  - Periodic Law
  - Alkali metals (group I)
  - Some medical uses of group I elements.
  - Alkaline-earth metals (group II)
  - Some medical uses of group I elements.
  - The transition elements
  - Medical uses of some transitional elements.
  - Halogens (group VII)
  - Medical effects of halogens.
  - Isotopy
  - The mole concept
  - Using moles to balancing & write equations
  - The empirical & molecular formulas of compounds

- Allotropy
- Alloy
- Absorption & emission spectra
- Radioactivity and Radiations

- **Acids and Bases**
  - Volumetric analysis

Organic Compounds:

- Carbohydrates: Classification, types and functions
- Lipids and membranes: definitions, types, chemistry, nomenclature properties and classification
- Amino acids and Proteins: definitions, types, chemistry, properties, notion of peptide basics.
- Structural levels of Proteins, biological functions

HSI113: Fundamentals of Nursing I : Overview-Concepts-History-Theories

Objective: At the end of this course, the student should master the concepts and theories in nursing and the nursing process.

Content:

1. **Concepts and theories in nursing sciences (2 Credits)**

- **Clarification of concepts**
  - Health,
  - Sickness ;
  - Life,
  - Death,
  - The health continuum ;
  - Signs and sickness;
  - Need ;
  - The concept of paradigme,
  - Theories ;
  - Modeles,

- **Theories in nursing sciences**

  a. **Suzanne KEROUAC'sapproach**
  - Schoolneed;
  - School of interaction.
  - School of desiredneeds;
  - School of health promotion;
  - School of the uniqueness of the human being.

  ➢ **A view of Nursing authors**
  - Florence NIGHTINGALE ;
  - Hildegarde PEPLAN,

- Martha ROGERS
- Gerthud UJHELY,
- Imogène KING,
- Nancy ROPER,
- Dorothy E. OREM
- Myra LEVINE ;
- Callista ROY ;
- Affef MELLES,
- Virginia HENDERSON,
- Dorothy E. JOHNSON,
- Marjory Gordon ;
- MC GILL ;
- Betty NEUMAN,
- PENDER,
- IDA Orlando,
- Joyce Travelbee ;
- PARSE ;
- Leninger ;
- Laring WATSON ;

➢ **Nursing care**

- Concept of nursing Science;
- Types and nature of nursing care

➢ **Conceptual notions in nursing:**

- Definition ;
- Importance of nursing concepts ;
- Criteria of choice of concepts in nursing.

b. Virginia HENDERSON's concepts

1. Components of models
2. Fondamental needs ;
3. Dependance, independance ;
4. Sources of difficulties
5. Virginia HENDERSON'sanalysis table
6. Virginia HENDERSON's model of data collection

c. MARJORY GORDON's model

1. The 11 vital functions of man;
2. MARJORY GORDON's model of data collection.

HSI114: Social Sciences I : Medical Sociology, Anthropology & Psychology

Objective:

- To outline key ideas about dysfunctional patterns of behavior.
- To discuss maladjusted responses resulting from defects in personality development and suggest ways that nurses can help.

Content:

- Introduction to psychology
- Major steps of life:
- Emotional, Intellectual, psychomotor and psychosocial evolution of the individual: First age, second age, preschool, school, adolescence, adulthood, aging.
- Body structure and body image
- Personality
- Dynamic aspects of personality, unconscious, instinct, repression, motivation.
- Defense mechanism and adaptation.
- Emotional states: Feelings, emotions, fear, anger, distrust, anxiety.
- Comportments and behaviors.
- The different modes of relationship: social, educational, cooperative, authority, dependency, acceptance, mothering.
- Evolution of life and of the human being in his psychological dimensions.
- The doctor – patient relationship: specificities.

Sociology:

Introduction to sociology

- Concept of group: Social groups (family, work groups, institution).
- Dynamics of small groups
- Dynamics of conflicts: Leaders
- Communication and communication networks
- Evolution of life and the human being in his social dimensions.

Anthropology / Ethnology

- Notions of anthropology and ethnology
- Anthropology, ethnology
- Customs and cultural PWnomena
- The innate and the acquired myths and beliefs
- Cultural attitudes to health, illness, death.

HSI115: Fundamentals of Nursing II: Human Development Across The Life Span

Objective: To outline key ideas about dysfunctional patterns of behaviour. To discuss maladjustive responses resulting from defects in personality development and suggest ways that nurses can help.

Content:

- Introduction to psychology
- Major steps of life:
- Emotional, Intellectual, psychomotor and psychosocial evolution of the individual: First age, second age, preschool, school, adolescence, adulthood, aging.
- Body structure and body image
- Personality
- Dynamic aspects of personality, unconscious, instinct, repression, motivation.
- Defense mechanism and adaptation.
- Emotional states: Feelings, emotions, fear, anger, distrust, anxiety.
- Comportments and behaviours.
- The different modes of relationship: social, educational, cooperative, authority, dependency, acceptance, mothering.
- Evolution of life and of the human being in his psychological dimensions.
- The doctor – patient relationship: specificities.

HSI116: Field Placement I (Immersion in Hospital)

HSI117: Bilingual training

- **Bilingual Training: 3 credits (45 hours); L, T, SPW**
  - **English: 1.5 credits (22 hours 30mn)**

1. Vocabulary

- Technical and usual vocabulary of the specialty

2. Grammar

3. Bilingual expression

- Understanding in interaction in Technical Discussions
- Continuous oral communication: Show, explain, develop, summarize, account, comment;
- Interactions oral communication

4. Autonomous reading of "writings" of all levels

- Lead by a quick reading to understand the general sense;
- Browse a text long enough to locate desired information;

- Gather information from different parts of the document or of the different documents in order to accomplish a specific task.

5. Write clear, detailed texts

- Essay writing;
- Application for employment;
- C.V;
- Letter of motivation;
- Letter / memo writing and minutes of a meeting

➢ **French : 1.5 credits (22 hours 30mn)**

1. Vocabulaire

Vocabulaire technique usuel

2. Grammaire

- Du verbe : Conjugaison aux temps communément utilisés – présent, passé composé, imparfait, futur, conditionnel, plus-que-parfait, l'impératif, l'infinitif, la voix passive ;
- De l'adjectif : qualificatif, possessif, démonstratif, interrogatif, numéraux, indéfinis ;
- Du nom et son article: masculin/féminin ; singulier/pluriel ; dénombrable et non-dénombrable ;
- Du pronom : personnel, possessif, interrogatif, démonstratif, relatif, indéfini ;
- De l'adverbe et de la locution adverbiale : pour dire comment, où, quand et pourquoi ;
- Des fonctions grammaticales.

3. Expression et communication

- Compréhension et interaction au cours d'une discussion technique ;
- Communication orale courante ;
- Communication orale interactive ;
- De la phrase : simple, complexe, composée ; interrogative, déclarative, exclamative et impérative.
- Lecture rapide et compréhension de texte ;
- Synthèse de texte
- De la communication : rédaction de texte, d'instructions, de rapport, d'une correspondance, d'une lettre recommandation ou de motivation, d'une demande d'emploi, d'une demande d'explication, d'une réponse à une demande d'explication, d'un CV ;
- Gestion d'une table ronde/discussion : la prise de notes, la prise de parole
- Expressions figées

HSI121: Anatomy and Physiology II

- **Anatomy physiology 2: 4 appropriations (60 hours); L, T, P, SPW**

1. **Cardiovascular system (1 Credit)**
   - The heart;
   - The general circulation;
   - The different parts of the circulatory system (arteries, system door, the veins, the pulmonary circulation);
   - Verification of the effectiveness of the Movement: blood pressure, pulse.
2. **The respiratory system (0.5 credit)**
   - Descriptive anatomy and appliquéedes respiratory tract;
   - Mechanism of the ventilation.
   - The respiratory échangesgazeux;
   - Lesmodifications of the respiratory system during pregnancy.
3. **The digestive system (0.5 credit)**
   - Descriptive anatomy of the digestive system;
   - The bodies annexs to the digestion - The mechanism of digestion; - The Digestive changes during the course of thepregnancy.
4. **Urinary system (0,5crédit)**
   - Anatomy of the kidney;
   - Schematic and functions of the various parts of the 2 types of nephron;
   - Mechanism of production of urine (glomerular filtration, tubular reabsorption, tubular secretion);
   - Anatomy and Physiology of the ureters of the bladder and the urethra ;
   - Physiological changes of urinary system during the pregnancy.
5. **The genital system (0.5 credit)**
   - Anatomy of the genital system the masculine and the feminine and the glandesannexes;
   - Physiology of the semen: sperm analysis;
   - Physiology of the genital system masculine: spermatogenesis;
   - Physiology of the genital system female: oogenesis, ovarian cycle, hormonal regulation of the ovarian cycle, menstrual cycle, effects of estrogen and progesterone, the sexual response of the woman; - anatomy physiology of the breast.
6. **Osteology, Arthropologie and general Myology (1 credit)**
   - The OS and the skeleton;
   - The Joints
   - The musculature;
   - The baNUS at the woman.

- **Semiology: 1 credit (15 hours) ; L, T, P, SPW**
  - Definition, etiology, sign and symptom of a few affection of:
    - The Respiratory System
    - The urinary tract
    - The circular device
    - The Digestive System
    - Nervous System
    - Sense Organs
    - Dermatology
    - Musculoskeletal Health
    - Genitourinary

HSI 122: Microbiology II: Virology-Mycology-Immunology

Objective: This course is designed to give a basic understanding of microorganism. Upon successful completion of the course, the student should be able to:-

- Have a general notion of Microorganisms
- Know the useful and harmful effects of microbes to humans
- Differentiate prokaryotes from Eukaryotes
- Perform Preliminary basic laboratory techniques for identifying Microorganisms

Cultivation of bacteria

Types of culture media

Bacteria growth: Batch and Continuous systems, various phases of a bacteria growth curve

Microbial growth requirements: Physical requirements (Oxygen, temperature etc.), Chemical requirements (Nitrogen, Carbon etc.) and Growth factors (Vitamins, amino acids, pyrimidine and purine bases)

Introduction to viruses, General characteristics of viruses, General structure and functions of the various parts of a virus, Classification of viruses: In terms of nucleic acids, morphology, Viral replication: adsorption, penetration, uncoating etc. Terminologies related to the control of microbial growth (sterilization, disinfection, bacteriostatic, bactericidal etc.)

Introduction to Mycology

- Beneficial and harmful importance of Fungi
- General characteristics of Fungi
- General life cycle of fungi
- Sexual and Asexual reproduction in fungi
- Types of Mycoses
- Laboratory diagnosis of Mycoses

HSI123: Fundamentals of Nursing III: Nursing Science and First Aid

Objective: The student should understand the nursing process;
Content

1- The nursing process

- Analysis and interpretation of results.
- The concept of nursing diagnosis;
- The nurses intervention;
- The nursing care plan and register;

2- **Nursing care Planification**

3- First Aid

- Definition, concept of first aide, hemorrhage (bleeding), fainting, choking and drowning,
- Shock and electrocution, coma (unconsciousness) and heat stroke (sun burn), fractures, sprains and strains and dislocations, poisoning, animal bites and insect stings,

HSI124: Public Health: Epidemiology-Demography-Environmental Sanitation &Health Promotion

Objective: To master of the elements of public health related to epidemiology, demography the environment and health promotion.

Content:

1. **Epidemiology**
   Epidemiology method, health measurement, epidemiological data, measurement of epidemiological frequency, prevalence, incidence, associated impact of epidemiology, precise and validation of epidemiology, precise problem of sample collection.
2. **Demography**
   Definition, goal of demography, notion of demography, characteristic of the population, notion of type of demography, ratio, ascending pyramid of age, stratify population, interpretation.

- **Environmental Health: 1.5 credits (22.5 hours); L, T, SPW**

1. **Hygiene and Sanitation in the middle**
   - **PersonaLygiene**
     - Physical (clothing, cleanliness, sport);
     - Mental (sleep, noise, addiction).

- **Food Hygiene**
  - Food (balance, conservation);
  - Drinking water (domestic treatment of drinking water);
  - Addiction (tobacco, alcohol, drugs).
- **Hygiene of the Environment**
  - Habitat (overcrowding, facilities, wastewater, waste);
  - Collective facilities.

2. Hospital hygiene

- Definition;
- Importance;
- Purpose;
- Individual measures;
- Collective measures Institutional andthe nosocomial infection:
  - Definition;
  - Contributing factors;
  - Plan to Combat (organization of the fight);
  - Hygiene of the patient (toilet, bed linen, etc.);
  - Hygiene of the staff (held, hands);
  - Hygiene of care and of the equipment of care (asepsis, antisepsis, decontamination, disinfection, methods and sterilization procedures physical and chemical);
  - Specific hygiene in the surgical blocks;
  - Remediation of the hospital environment (water, waste, facilities);
  - Regulation of the movement of patients and staff in the hospital environment.

3. The promotion of health - Health Promotion;

- Definition;
- Different aspects;
- Persons likely to participate;
- The techniques of communications.

HSI125: Medical Nursing I

Objective: To take care of patients in a medical ward.

Content:

1. Clerking

- Guidelines for collecting history
- Importance of health history
- Components of health history taking
- Physical examination (PE)

- Importance of physical examination
- Guidelines for carryout a PE
- Techniques for carrying out a PE
- Vital signs
- Importance of vital signs
- Recording PE and principles guiding recoding of PE
- Guidelines for vital signs
- Technique

2. Temperature

- Clinical thermometer
- Sites for temperature assessment
- Few keys features surrounding temperature

3. Pulse

- Assessing pulse (radial)
- Pulse characteristics

4. Respiratory Rate

- Dyspnea

5. Arterial Blood Pressure (BP)

- Assessing BP
- Drug administration
- General rules for administering medication
- Principles of administering medication
- Maintaining safety in drug administration
- Calculating drug doses
- Medication errors
- Routes and techniques of drug administration
- Enteral routes
- Parenteral routes
- Details on routes of drug administration
- Oral medications
- Injectable
- Intra- muscular routes
- Sites identification
  a) a)buttocks
  b) Thigh
  c) The upper arm
- Subcutaneous route (procedure)
- The IV route

HSI126: Field Placement II (Immersion in District Council)

HSI127: Civics and Ethics – ICT I

- **Civics and Ethics 2 credits (30 hours); L, T**

Objective: At the end of this course, the student should acquire basic knowledge on civics and ethics applicable by the citizen in his daily life and at his job site.

Content

- **The Concepts**
  - The citizen;
  - The Nation;
  - The State;
  - Publics Property and collective's goods;
  - The freedoms;
  - The public service;
  - Ethics;
  - Ethics, Law and reason;
  - Ethical Problem ;
  - Ethics and management.
  - Civics
  - Deontology
  - Moral consciousness
  - The universal declaration of Human Rights
  - Good governance in public services
  - The importance of civics to the life of the nation
  - Functions of the state and its citizens
  - Deontology, Professional ethics and professionalism
  - Relationship between morality, law and ethics
  - Codes of ethics

- **Techniques of Information and Communication 1**
  - Concepts and architecture of computers
  - Definitions: computing, information, computer, data, program, software, drivers
  - System of enumeration of base 2, the unit of measure of the information and its multiple
  - Components of the computer (hardware and software)
  - Study of an operating system
  - Study of a text treatment software: Microsoft Word
  - Study of a spreadsheet/Microsoft Excel
  - Study of a presentation software: Microsoft PowerPoint

HSI231: Food and Nutrition

Objective: To understand the concept, basic principles behind food & nutrition and its role.

Content:

Food, Nutrition and Health: Principles of Nutrition and Health; Food Selection and Meal Planning; Food Preparation and Service: Principles and Methods
Food Technology: Cameroonian Foodways and Food Systems; Food Science and Technology; Food Preparation and Service: Large Quantity and Commercial.

HSI232: General Safety, Occupational Health And Hygiene

Objective: This introduces the student to the study of workplace occupational health and safety. The student will learn safe work practices in offices, industry and construction as well as how to identify and prevent or correct problems associated with occupational safety and health in these locations as well as in the home. The course is designed to assist the student with the implementation of safe healthy practices at work and at home.

Content:

1. Personal Health and Safety

- Personal health and safety at home and in the workplace
- Blood borne virus, hepatitis B, HIV
- Dermatitis, skin care

2. Personal Safety

- Emergency first aid treatment
- Reaction to accidents
- reporting of accidents
- Pro-active procedures when accidents occur
- cleaning the accident site
- Personal safety wear and protective equipment

3. Accidents & Their Effect on Industry

- Costs of accidents
- Work accident costs and rates
- Time lost
- Work injuries, parts of the body injured on the job
- Chemical burn injuries
- Carpal Tunnel Syndrome Injuries
- Drugs and Alcohol in the Workplace

4. Theories of Accidents-(Essay-Select 1 of the followingtheories)

- Domino Theory of Accident Causation
- Human Factors Theory of Accident Causation
- Accident/Incident Theory of Accident Causation
- Epidemiological Theory of Accident Causation

- Systems Theory of Causation
- Combination Theory of Accident Causation

5. WHMIS (Workplace Hazardous Material InformationSystem)

- Routes of entry into the body of toxic materials
- General safety precautions
- cleaning chemical spills
- MSDS sheets

6. Falling, Impact, Acceleration and Lifting Hazards

- Correct lifting techniques
- Selecting correct lifting procedures in the workplace
- Safety equipment
- Safe storage of materials at home and in the workplace
- Dealing with manual handling

7. Workers Compensation

- Injuries and workers compensation
- Workers' compensation legislation
- Resolution of workers' compensation disputes

8. Roles of Health and Safety Personnel

- The modern health and safety team
- Health and safety manager
- Engineers and safety

9. Stress and Safety

- Workplace stress defined
- Sources of workplace stress
- Human reaction to workplace stress
- Measurement of workplace stress
- shift work, stress and safety
- improving safety by reducing stress
- Stress in safety managers
- Stress and workers compensation

10. Mechanical Hazards and Safeguarding

- Common mechanical injuries
- safeguarding defined
- Lockout/tag out systems
- taking corrective action

11. Heat and Temperature Hazards

- The body's response to heat
- Heat stress and its prevention
- Overview of cold hazards
- Preventing cold stress

12. Fire Hazards

- Sources of fire hazards
- Fire dangers to humans
- Detection of fire hazards
- reducing fire hazards
- Development of Fire Safety Standards
- Fire safety myths
- Fire hazards defined

13. Noise and Vibration Hazards

- Hazards levels and risks
- Identifying and assessing hazardous noise conditions
- Noise control strategies
- Vibration hazards

14. Preparing for Emergencies

- First aid in emergencies
- Reporting accident

15. Promoting Safety

- Safety committees

16. Health and Safety Training

- Rationale for health and safety training

17. Industrial Hygiene

- Hazards in the workplace
- Entry points for toxic agents
- Airborne contaminants
- Asbestos hazards
- Hazard recognition, evaluation and control

Select one of the following Chapters for group presentation:

- Computers, Automation and Robots
- Safety and the Environment
- Product Safety and Liability
- Ergonomics and Safety

HSI233: Water Sanitation and Air Sanitation

- **Water Sanitation**

Objective: It introduces students to the principles of infrastructure planning in developing countries, with a focus on appropriate and sustainable technologies for water and sanitation.

Content:

- Historic importance of WASH in improving health;
- Current relationship between WASH and health;
- Infectious and noninfectious agents of disease.

- WHO's definition of environmental Sanitation? Safe and whole some water, Sources of water, various uses of water and its need.
- Water borne diseases, conservation source of water, quality of water, public health aspect of very hard water,
- Steps of disinfection of well.
- Physical, chemical and biological standard for portable water sources and nature of pollution of water in large scale and small scale.
- Process of disinfections of water in large and small scale provisions for sanitary wells and tube wells, plumbing system and its maintenance.
- Water supply and storage system at the community and domestic level.
- Classification of sources of water.
- Difference between shallow and deep well.
- Process of sanitary well.
- Demonstration of a protected well in village.
- Sanitary inspection of water supply.
- Collection and despatch of water sample for chemical arsenic and bacteriological examination.
- Purification of water in urban area.
- Purification of water in rural area

➢ **Air Sanitation**

Objective: This course will teach about air pollution and air sanitation.

Content:

- Concepts and importance of adequate ventilation.
- Types of ventilation.
- Natural ventilation.
- Mechanical ventilation.
- Indicators of air pollution.
- Process air purification and disinfection.
- Green house effect, type of ventilation, thermal comfort, air temperature humidity, radiation, evaporation and their measurements.
- Demonstration of an air conditioning plant for thermal comfort.

HSI234: Noise Pollution and Management

Objective: This course will teach about sound pollution and its management.

Content:

Basics of acoustics and specification of sound; sound power, sound intensity and sound pressure levels; plane, point and line sources, multiple sources; ouTHoor

and indoor noise propagation; psycho-acoustics and noise criteria, effects of noise on health, annoyance rating schemes; special noise environments: Infra-sound, ultrasound, impulsive sound and sonic boom; noise standards and limit values; noise instrumentation and monitoring procedure. Noise indices.

HSI 235: Personal Hygiene

Objective: In this course the student will learn the principles and techniques of personal hygiene.

Content:

- What is personal hygiene?
- Difference between cleanliness and hygiene
- Public health importance of personal hygiene
- Components of personal hygiene
- Eye hygiene
- Hair hygiene
- Body hygiene
- Oral hygiene
- Armpit and bottom hygiene

HIS 236 : Field Placement III (Food and Water industries/Market)

- **Field Placement III (Food and Water industries/Market)**

HIS 237 : French for Medical profession/ English for Medical profession/ICT II

Objective: To develop communication skills in French and English language and thus enhance patient relationship as needed.

Content:

1. Grammar
2. Different parts of the human body
3. Conversation in French and English as specific to health care
4. Translation of Medical Terms, prescriptions, technical and protocol forms, drug dispensation notices
5. Drafting of reports
6. Documentation research
7. Use of data sheets and protocols in the French language.
8. Health structures, premises, equipment, professional categories
9. Drafting of research topics
10. Dissertation on the professional articles
11. Interviews - Speech unto etc.
12. Health structures, premises, equipment, professional categories

13. Hospitals
14. The Hardware
15. The staff
16. The Role
17. The pathologies
18. The drugs
    - **The pathologies by systems**
        - Urinary system;
        - Cardiovascular System;
        - Digestive system;
        - The endocrine system.
    - **The dispensing of drugs**

➢ **Information and Communication Techniques 2**

1. Creation of a simple database with a spreadsheet (How to Give a name to a cell range)
2. Validation of Data in a range of cells on a spreadsheet
3. Creation of the statistical tables simple (modality, workforce, frequency) and automatic filling with functions such as NB, NB.If and NB.If.ENS, Average, Sum, if
4. Creation of graphics from statistical tables
5. Presentation and use of a statistical software (ex: Epi Info)
6. Creation of a questionnaire on EPI info or other
7. Data entry and analysis
8. Definition of the concepts of the computer network
9. Presentation of the types of media and networks
10. Presentation of Internet (Connection, research, download)
11. Networks withoutwires
12. Learning of a software application
13. Numbering system
14. Computer Security: Virus and antivirus

HSI241 : Health Education and Communication

Objective: This course is designed to help students identify, analyze, and apply concepts, theories and methodologies related to health communication in various settings and at various levels of influence. Emphasis will be placed on learning how to design, communicate and evaluate effective health promotion messages.

Content:

1. **Health Education: Meaning, Definition, Objectives and Importance**

2. **Communication for Health**
    - Information: Definition and Components.
    - The process of communication.
    - Methods & media of communication.
    - The concept of Information Education and communication (IEC) for health.
    - Health Ethics.
3. **Making Health Communication Effective**
    - Inter personal methods of communication.
    - Mass Media Methods of communication.
    - Equipment for mass media communication.
    - Modes, types and barriers of communication.
4. **Patient Education for Common Acute Diseases**
    - Dental Diseases.
    - Diarrhea.
    - Vomiting.
    - Cough.
    - Cough & breatHCMessness (Bronchitis).
    - Asthma.
    - Skin Diseases (e. g. scabies, boils, infected wounds).
5. **Patient Education in Chronic Diseases**
    - Diabetes.
    - Asthma and Chronic Bronchitis.
    - Hypertension.
    - Arthritis.
    - Ischemic Heart Disease.
    - Obesity.
    - Cancers.
    - Other Chronic Diseases.
6. **Sexuality Education and Family Life Education**
    - Prevention of STHs (Syphilis, Gonorrhoea, Pelvic Inflammatory Disease (PID)).
    - Prevention & control of HIV/AIDS.
    - Safe sex.
    - Universal safety precaution for control of HIV/AIDS.
    - Planned Parenthood and Family Planning.
7. **Public Relations in Health Care Service Institutions**
    - Definition of public relation.
    - Role and importance of public relations in health care service institutions.

- Role of General Health Assistant (GHA) in the hospitals.
- Staff-patient relationship.
- Doctor-patient relationship.
- Personal hygiene of hospital staff.
- Empathy Vs sympathy in patient care.
-

8. **Public Health**
    - Principles of Public Health.
    - Immunization.
    - National Health Programmes I (National Rural Health Mission including RCH II).
    - National Health Programmes II (RNTCP, Malaria control, Blindness control, HIV/AIDS control, others).
    - Disinfection of Water.
    - Sanitation & disposal of Excreta.
    - Methods of Disinfection.
    - Data Collection.
    - Basics of Medical Statistics like Mean, Mode, Median, Charts, and Diagrams& Sampling Method.
    - Techniques of Health Education.
9. **Organizational Behaviour: Meaning, Importance of Human Relationship in Healthcare Institutions.**
    - Organizational Behaviour: Meaning, need and importance, Internal and External human relations, factors affecting human relations, behavior in organizations at the individual and group level, effect of organization structure and process on behaviour.
    - Group Behaviour: Group Dynamics formal and informal groups, Group decision making techniques, Team: Meaning, purpose, Type, Life cycle, Team work, Team building, team effectiveness.
    - Conflicts: Nature, levels, effects, conflict resolution process, Transactional analysis – meaning, benefits.
    - Customer Relations: Significance, How to deal with customers.

HSI242: Behavioral Science, Complimentary & Alternative Medicine

- **Behavioral Science**

Objective: After this course, the students will be able to understand the basic behavioral science theories and apply these theories to any observed behavior of self and others.

Content:

- Introduction

- Methods used in behavioural sciences
- Behaviour of the Individual
- Nature/nurture debate
- Behaviourism and learning theories
- Behaviour Modification
- Science of Relationships
- Non-verbal communication
- Interpersonal relationships
- Friendship and Love
- Behaviour at Work
- Adjustment to Work
- Motivation at work
- Group dynamics
- Decision-making
- Health and Illness behaviour
- Determinants of health
- Psychopathology
- Stress, coping
- Healthy lifestyles

- **Complimentary & Alternative Medicine**

Objective: Thi**s** course is designed to introduce the health sanitary inspectors to the philosophies, practitioners, techniques, and evidence of efficacy of complementary and alternative medicine (CAM) therapeutics currently in use.

Content:

- Massage & Other Bodywork Therapies
- Tai Chi & Qigong
- Nutritional Medicine
- Ayurvedic Medicine
- Hypnotherapy
- Neurofeedback
- Biofeedback
- Herbals in Health & Healing
- Herbal Medicine: Safety, Efficacy & Effectiveness
- Acupuncture & Traditional Chinese Medicine
- Introduction to Osteopathic Medicine
- Chiropractic
- Aromatherapy/Essential Oils

HSI 243: Biotechnology application for Environmental Protection

Objective: This will teach the students about the biotechnological applications for environmental protection.

Content:

Environmental Biotechnology: Basic Concept

Principles and concepts of environmental biotechnology – usefulness to mankind.

Biotechnology in Pollution Control

Types of pollution, Methods for measurement of pollution, Methodology of environmental management, air pollution and its control through biotechnology. Water as a scare natural resource, need for water management, measurement of water pollution, waste water collection, waste water treatment – Physical, chemical and biological treatment processes. Solid waste management (composting, wormiculture and methane production)

Microbial Technology for Waste Management

Degradation of high concentrated toxic pollutants, non-halogenated, halogenated petroleum hydrocarbons-metals. Mechanisms of detoxification-oxidation reactions, de-halogenation biotransformation of metals.Microbial cell/enzyme technology – adapted microorganisms – biological removal of nutrients microalgal biotechnology and applications in agriculture- role of extra cellular polymers. Biotechnological remedies for environmental damages – decontamination of ground water systems subsurface environment – reclamation concepts – bioremediation. Production of proteins – biofertilizers. Biodegradation of solid wastes – physical, chemical and microbiological factors of composting – health risk – pathogens – odour management – technologies of commercial importance advances in biogas technology – case study.

Fermentation Biotechnology

Anaerobic digestion, anaerobic filters, Up-flow unanaerobic sludge blanket reactors, treatment schemes for waste water of daiy, distillery, tannery, sugar, antibiotic industries. Aerobic process, activated sludge, oxidation ditches, trickling filters, towers, rotating biological contractors, oxidation ponds.

Biotechnology and Global Environmental Problems

Ozone depletion UV-B, green house effect and acid rain, their impact and biotechnology approaches for management.

HSI244 : Night Soil Disposal

Objective: This course will teach the students about the need and techniques of night soil disposal.

Content:

Fly nuisance Soil pollution. Water pollution Food contamination, Faucal - borne disease due to unsanitary disposal. Different types of latrines in use principal of

construction of sanitary latrines and their use, especially berg hole, dug well, RCA and septic tank latrine. Sewage system or water carriage system. What is sewage.Why sewage purification is required. Sewer appurtenances, house drain.Street sewers or municipal sewers.Sewage forming land treatment.Sewage disposal by Biogas plant or gobar gas plant.Methods of disinfection of sewage. Sanitary practices of sewage farming

Demonstration of sewage treatment plant.Inspection of flushing tank, soil plant, traps, man holes, inspection chambers and maintenance of gully trap.Collection of sewage sample for chemical and bacteriological analysis and interpretation or reports. Inspection and maintenance of sewage treatment plants and disinfections of stabilized sewage. Organization of cleaning, minor engineering and oil operation of the sewage system. Detection of pollution of water from sewage

Construction and maintenance of sanitary latrines.

- Soakage pit.
- Sanitary latrine.
- RCA latrine
- Septic tank latrine
- Sewage treatment plant.
- Sulabh Sauchalaya

Maintenance of trenching ground

HSI245: Soil Sanitation

Objective: In this course the student will learn the Principles and Techniques of soil sanitation.

Content:

- Classification of soil.
- Classification from the view point of importance in Public Health. Reason for the excessive moisture in the soil.
- Reclamation of land.
- Soil, bacteria and parasites.
- Soil and Health.
- Study on insecticides, pesticides and disinfections.
- Sterilization & disinfection of different Articles.
- Various spraying equipments.
- Sampling for assessment of soil pollution.
- Treatment of soil to alter the PH and disinfections.

HSI246: Field Placement IV (Hotel and Dormitories) – Introduction to Operational Research

Objective: At the completion of this course, students should be able to:

- Understand the concepts of research in the biomedical sciences and be able to apply them
- Be able to accurately describe the fundamental concepts and approaches in qualitative and quantitative research methodology.
- Be able to find and appraise the available research literature through the use of valid resources, and thereby provide informed opinion.
- Be able to raise research questions in professional practice and apply appropriate research methodology to investigate and solve the research questions.
- Write a research proposal for approval by the Ethics Committee.
- Understand the role of bias and confounding and how to control for these in selection of study design.
- Appreciate the role of chance/random error, and the appropriate choice and application of statistical testing to assess this.
- Demonstrate the skills and knowledge required for independent or group research.

Content:

Introduction to research: Meaning and objectives of research; definition and Significance of health research, importance of research methodology for health science students.

Scientific research: Definition; C**haracteristic of scientific research:** Purposiveness, Rigor, testability, reliability, validity, replicability, precision, generalizability, objectivity); **Dimensions of scientific research** (concepts, theories, deductive & inductive reasoning, empiricism, variables, hypothesis, propositions **Elements of the Scientific Method**: Empirical Approach, Observation, Question, Hypotheses, Experiments, Analysis, Conclusion, and Replication

Scientific research process:

Categories of Research: Empirical and theoretical research, Basic and applied, Descriptive vs Analytical Research, Quantitative vs Qualitative Research, Conceptual vs Empirical Research, Etc.

HSI247: Biostatistic – Health Information System

- **Introduction to Research**

Objective: At the completion of this course, students should be able to:

- Understand the concepts of research in the biomedical sciences and be able to apply them
- Be able to accurately describe the fundamental concepts and approaches in qualitative and quantitative research methodology.
- Be able to find and appraise the available research literature through the use of valid resources, and thereby provide informed opinion.
- Be able to raise research questions in professional practice and apply appropriate research methodology to investigate and solve the research questions.
- Write a research proposal for approval by the Ethics Committee.
- Understand the role of bias and confounding and how to control for these in selection of study design.
- Appreciate the role of chance/random error, and the appropriate choice and application of statistical testing to assess this.
- Demonstrate the skills and knowledge required for independent or group research.

Content:

Introduction to research: Meaning and objectives of research; definition and Significance of health research, importance of research methodology for health science students.

Scientific research: Definition; C**haracteristic of scientific research:** Purposiveness, Rigor, testability, reliability, validity, replicability, precision, generalizability, objectivity); **Dimensions of scientific research** (concepts, theories, deductive & inductive reasoning, empiricism, variables, hypothesis, propositions **Elements of the Scientific Method**: Empirical Approach, Observation, Question, Hypotheses, Experiments, Analysis, Conclusion, and Replication

Scientific research process:

Categories of Research: Empirical and theoretical research, Basic and applied, Descriptive vs Analytical Research, Quantitative vs Qualitative Research, Conceptual vs Empirical Research, Etc.

- **Biostatistics I**

Objective: To summarize, analyze, present and interpret health statistical information.

Content:

1. Introduction

2. Basic concepts in biostatistics
3. Sampling techniques and data collection
4. Variables (Qualitative and Quantitative)
5. Presentation of data: Frequency and frequency distribution, bar charts, Histograms, pie charts etc.
6. Summarization of qualitative and quantitative data: mean, median, standard deviations and standard errors.

- **Biostatistics II**

Content

1. The concept and Principles of Significant tests and confidence intervals
2. Statistical testing and inference: The normal distribution and t-distribution, Chi squared test, Poison distribution, non-parametric tests etc.
3. Errors in statistics

➢ **Health Information System: 2 credits (30 hours); L, T, SPW**

1. Definition;
2. Goals;
3. Statistical elements:
   - Unit unto Population, Sample;
   - Sources of statistical data;
   - The statistical calculation.
4. The process of health information: - collection of data;
   - Media, routing;
   - Treatment (counting, grouping, presentation);
   - Analysis and interpretation;
   - Retro-information and decision-making.

HSI351: Built Environment

Objective: This course will teach the students to understand and apply the principal behind healthy living in built environment e.g. house.

Content:

- Home injuries
- Indoor Air Quality
- Pests & pest control
- Crowding
- Water/sanitation
- Location
- Climate protection function
- Requisites of satisfactory and safe housing, sanitary standards for construction of houses and provision of utility services. Assessment of overcrowding.

- Survey of housing for assessing sanitary standards and prescriptions of remedial measures.

HSI 352 : Occupational Health and Health Care Management

- **Occupational Health**

Objective: This course will teach the students how to evaluate a work environment and plan an environment with occupational safety.

Content:

- Industrial hygiene
- workers health protection
- occupational risk factors and safety measures
- control of dust and other hazardous substance
- safety measure for occupational risk factorlegislative provisions
- benefits to employees
- Inspection of trade premises.
- Visit to a factory for survey of sanitation problems of the workplace.
- Identification of danger zones and adequacy of safety arrangements.
- Health and sanitation survey of the vicinity of the industrial establishment for identification of health problems emerging from industrial pollution and suggestions for remedial measures.
- Environmental pollution- its causes, consequences, mitigation and remedies.

- **Health Care Management**

- The Cameroon Health organization
- Missions of health units in the National territory: Health centers, district hospitals, Central hospitals, University teaching hospitals, private, lay, and denominational hospitals and clinics,
- Relationship with health, national and international poverty-control organizations (other ministries, donors, international organizations, NGOs, associations),
- Economic and financial management. Management of personnel, staff planning, and in service training, Management of nursing care and drugs.
- Legislation applying to health units
- Economic and financial management
- Management of personnel, staff planning, and in service training,
- Management of nursing care and drugs.
- Characteristics of an administrative document, Administrative letter writing.

- Report writing, Forwarding slip and Forwarding letter
- Public and private administrative letters and the memorandum
- Administrative note, various administrative forms, the pay voucher.
- Status of the staff of the Ministry of Public Health and Higher education
- Trade unions and Associations: the right to strike.

HSI353: Burial and Cremation Ground and Mass Casualty Disposal

Objective: The subject serves to integrate the knowledge gained by the students in creating safe burial and cremation ground and mass casualty disposal.

Content:

- Disposal of dead- Human.
- Burning or cremation.
- Requirement for a burning ground.
- Disposal of dead bodies and maintenance of their records.
- Visit to burial or funeral ground for sanitation, proper process of disposal of dead body and maintenance of records as per legal provision.

HSI354: Control of Biological Environment

Objective: The course is designed to provide knowledge in assessing and controlling the biological environment for healthy environment.

Content:

- Study on insecticides, pesticides and disinfections.
- Sterilisation & disinfections of different articles.
- Various spraying equipments.
- Uses of rodenticides & larvaecidals.
- Identification and use of insecticides, pesticides and disinfection
- Application of Techniques of sterilization and disinfection of various articles.
- Identification of different parts of spraying equipments
- Operation and maintenance of spraying equipment.
- Use of Larvicide's.
- Use of rodenticides

HSI355: Sanitation Measures in Fairs, Festivals and Natural Calamities- Mass Casualty Disposal

Objective: The subject serves to integrate the knowledge gained by the students in creating safe and healthy environment at public gatherings and mass casualties.

Content:

- Sanitation Management at fairs and festival. Sanitary problems associated with human gatherings and temporary settlements.
- Alternate emergency sanitary provisions to prevent sanitation crisis for food, housing, water supply, lighting, disposal of community waste and prevention of outbreak of epidemics.
- Inspection and preparation of fair and festival, industry and trade.

HSI356: Field Placement V (refugees camps or prisons)

- **Field Placement V (refugees' camps or prisons).**

HSI357: Medical Law

- **Medical Law**

Objective: To know the components of medical law.

Content:

- Chapter one: criminal law
- Chapter two: criminal responsibility
- Chapter three: labour law
- Chapter four: some rights of the employee under the labour rule
- Chapter five: civil status registration
- Chapter six: right of women and children under the code
- Chapter seven: tort
- Chapter eight: inheritance, succession and wills
- Chapter night: introduction to human right
- Chapter ten: some international right instruments

- **Labor law: 1 credit (15 hours); L, T, SPW**
  - Definition of the right of labor, birth and evolution of labor law and sources
  - The contract of work (conclusion, implementation and rupture)
  - The conflicts of work (individual and collective)
  - The delegate of the staff, unions
  - Work accidents and occupational diseases
  - The hygiene and safety in the workplace
- **Administrative Law: 1 credit (15 hours); L, T, SPW**
  - Nature and function of the management of personnel, training and staff development, supervision and evaluation of employees;
  - assessment of jobs and administration of salaries;

- trade union organizations and labor legislation, collective bargaining, grievance and strikes; administration services to employees.
- Practical application in industrial administration, public and the hospital.

➢ **Comon law: 1 credit (15 hours); L, T, SPW**

- Society, ethics and the law;
- the foundation of the right and of the social life;
- concepts of health and education;
- place of the body in moral and in law;
- the right and duties of the individual and of the Community (right of patients, the rights of the person and the health care system);
- privatization and publicisation of health, respect for private life and social cost of health.
- Autonomy, participation, etc.

HSI362: Family Assessment and Food Hygiene and Sanitation

➢ **Family Assessment**

Objective: The objective of this course is to give the students an introduction to family assessment techniques.

Content:

- Introduction to Marital Assessment
- Theories of Attachment
- Divorce Predictors
- The Effectiveness of Marital Therapy
- Couples and Alcohol
- Depression and Psychological Illness
- Domestic Violence
- Introduction to Family Assessment
- Miscellaneous Family Assessment Tools

➢ **Food Hygiene and Sanitation**

Objective: This course is designed to integrate concepts in chemistry, organic chemistry, and biochemistry, with food processing sanitation and safety operations and understand their role in processing of food.

Content:

- Sanitation Overview
- Sanitary Regulations: GMPs
- Management and Sanitation
- ISO 9000, ISO 14000
- Microorganisms and their Relationship to Sanitation
- Food Contamination Sources

- Hazard Analysis and Critical Control Points (HACCP)
- Food Plant Design and Construction;
- Air Sanitation;
- Equipment for Effective Sanitation, Water Sanitation, Waste Product Disposal
- Personal Hygiene;
- Cleaning, Sanitizing
- Pest Control;
- Packaging Sanitation
- Food Storage Sanitation;
- Food Transport Sanitation

HSI363: Public Health Administration

Objective: The subject serves to make the students understand the public health administration and make them aware of various health projects.

Content:

- Organization of National Health Care Services.
- System of National Health Care Services
- Sub Center –
- Primary Health Care
- Community Health Care
- Specialization Health Intuitions.
- Health services in Cameroon
- Current status of Cameroon.
- Central, State and Local organizations in Cameroon.
- Relation with other departments
- International organizations and their cooperation in the field of Health. (WHO, UNICEF, UNDP (United Nation Development Programme)
- Voluntary Agencies in Health Programmes
- Operation Aspects of National Health Programs
- Family Welfare Program
- Maternity & child Health Service
- National Malaria Eradication program.
- National Filarial Control program
- National Leprosy program
- Diarrheas Disease Control program
- STH Control program
- Goiter Control program
- Blindness Control program
- Universal Immunization program

HSI364: Project Management

Objective: The subject serves to make the students able to do efficient project management.

Content:

Basics of Project Management: Introduction, Need for Project Management, Project Management Knowledge Areas and Processes, The Project Life Cycle, The Project Manager (PM), Phases of Project Management Life Cycle, Project Management Processes,Impact of Delays in Project Completions, Essentials of Project Management Philosophy, Project Management Principles

Project Identification and Selection: Introduction, Project Identification Process, Project Initiation, Pre-Feasibility Study, Feasibility Studies, Project Break-even point

Project Planning: Introduction, Project Planning, Need of Project Planning, Project Life Cycle, Roles, Responsibility and Team Work, Project Planning Process, Work Breakdown Structure (WBS)

Organisational Structure and Organisational Issues: Introduction, Concept of Organisational Structure, Roles and Responsibilities of Project Leader, Relationship between Project Manager and Line Manager, Leadership Styles for Project Managers, Conflict Resolution, Team Management and Diversity Management, Change management

PERT and CPM: Introduction, Development of Project Network, Time Estimation, Determination of the Critical Path, PERT Model, Measures of variability, CPM Model, Network Cost System

Resources Considerations in Projects: Introduction, Resource Allocation, Scheduling, Project Cost Estimate and Budgets, Cost Forecasts

Project Risk Management: Introduction, Risk, Risk Management, Role of Risk Management in Overall Project Management, Steps in Risk Management, Risk Identification, Risk Analysis, Reducing Risks

Project Quality Management and Value Engineering: Introduction, Quality, Quality Concepts, Value Engineering

Project Management Information System: Introduction, Project Management Information System (PMIS), Planning of PMIS, Design of PMIS

Purchasing and Contracting for Projects: Introduction, Purchase Cycle, Contract Management, Procurement Process

Project Performance Measurement and Evaluation: Introduction, Performance Measurement, Productivity, Project Performance Evaluation, Benefits and Challenges of Performance Measurement and Evaluation, Controlling the Projects

Project Execution and Control: Introduction, Project Execution, Project Control Process, Purpose of Project Execution and Control

Project Close-out, Termination and Follow-up: Introduction, Project Close-out, Steps for Closing the Project, Project Termination, Project Follow-up

Project Management Software: Introduction, Advantages of Using Project Management Software, Common Features Available In Most of the Project Management Software, Illustration

Case Studies in Project Management.

HSI365: Global Health

Objective: The subject serves to teach the students the global dimension of health.

Content:

- Introduction to global health
- Measuring the world's health
- Health, wealth, poverty, and inequality
- More health for the money - Priority setting and resource allocation
- Health systems overview
- Maternal and child health
- HIV/AIDS and tuberculosis
- Undernutrition and obesity
- Chronic diseases and risk factors
- Emerging infectious diseases
- Humanitarian emergencies
- Challenges: Health in the Africa

HSI366: Field Placement VI (Determine by title of project research)

HSI367: Professional Ethics and Deontology

Objective: At the end of the course, the student should use ethical values in health care decisions, use the civic and legal responsibilities in the execution of daily functions

Content: Professionalism and ethics of health care, responsibility, autonomy, rights of health care consumers, rights of health care providers, the Cameroon legal system, civic responsibilities, the place of the law in health care management, medical jurisprudence, malpractice and negligence. Knowledge on Crimes that may occur at work and how to determine them.

- **Health care Ethics**
  1. Morality and Ethics: Norms, Deviances, Religion, Values, Beliefs, Cultures
  2. Bioethics
  3. MLS Ethics

4. Moral Development
5. Ethical Principles: Autonomy, Freedom, Privacy, Confidentiality, Beneficence, Fidelity, Motivation, Justice, Veracity and Responsibility.
6. Code of Ethics health workers.
7. Application of Ethics to MLS Practice: Respect For Life And Death, The Concept Of Dignity, Euthanasia, Human Rights, Rights of The Child, Rights of The Elderly, Patients Rights
8. Ethical Decision Making Frameworks and their Application in diagnosis
9. Context And Conflicts With Bioethical Standards

- **Patient Rights**:
  1. Respect for life and death, the concept of dignity, euthanasia
  2. Care for dying patients: Palliative care, Confidentiality, Professional secrecy, Medical Research and Nursing care ethics.
  3. Code of ethics.

- **Health** Employee/employer contract law for health practitioners
- MLS and the law

- **Introduction to Law and Fundamental Rights**
- **Law**
  - Sources of law
  - Law and enabling Acts (text of application)
  - The concept of legal personality
  - Civil responsibility (contract, TORT)
  - Criminal responsibility
  - The court and their jurisdictions
  - Labor law: formation and execution of labor contract, remuneration, condition of work, obligation of the employer and employee, termination of labor contracts
- **Fundamental Rights**
  - The concepts of human rights
  - Sources of human right
  - Major international conventions of human rights
  - International conventions relating to women
  - Children and the rights of the minorities
  - The role of the judiciary and the legislative in the protection of human rights
  - The Cameroon national commission of human rights and liberties
  - The civil society NGO's and the protection of human rights
  -

- **Law for Medical laboratory personnel**
    - Definition of Law, public law, private law
    - The client's and MLS personnel's' constitutional right
    - Administrative law related to licensing and regulation of health practice

The Minister of Higher Education

Pr Jacques FAME NDONGO

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