REPUBLIQUE DU CAMEROUN
Paix – Travail – Patrie

MINISTERE DE L'ENSEIGNEMENT SUPERIEUR

REPUBLIC OF CAMEROON
Peace – Work – Fatherland

MINISTRY OF HIGHER EDUCATION

PROGRAMMES HARMONISÉS

DE LA

FILIÈRE MÉDICALE

AU

CAMEROUN

PROGRAMME D'APPUI A LA COMPOSANTE TECHNOLOGIQUE
ET PROFESSIONNELLE DE L'ENSEIGNEMENT SUPERIEUR
(PRO-ACTP)

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(PRO-ACTP)

Juillet 2015

PREFACE

Pendant longtemps le Cameroun a été confronté à un déficit du personnel de santé en général et des médecins, pharmaciens et odontostomatologues en particulier. A titre de rappel, en 2007 l'Université Camerounaise ne formait que 85 médecins généralistes et n'avait pas de formation en Chirurgie dentaire, ni en Pharmacie, et le ratio médecin / population était de 1 médecin pour 10.000 habitants.

Les engagements du Cameroun vis-à-vis des Objectifs du Millénaire en matière d'éducation et de santé étaient de ramener ce déficit à 1 médecin pour 3000 habitants, pour se rapprocher des standards des pays de même niveau de développement qui sont de 1 médecin pour 1000 habitants. Pour combler ce gap, le Cameroun avait un besoin estimé de 8000 médecins pour 22 millions de Camerounais.

Dans l'optique de réduire ce déficit, le gouvernement du Cameroun s'est engagé dans un vaste effort d'investissements sans précédents avec la construction et l'équipement de 03 nouvelles facultés de médecine (Faculty of Health Sciences de Bamenda et de Buea, la Faculté de Médecine et des Sciences Pharmaceutiques de Douala) et la réhabilitation, l'extension et l'équipement de la Faculté de Médecine et des Sciences Biomédicales de Yaoundé, ainsi que le recrutement de nouveaux enseignants.

Parallèlement à ces efforts et à la faveur de la loi d'orientation du 16 avril 2001 qui libéralisait les activités de formation supérieures et conférait au Ministère de l'Enseignement Supérieur le contrôle de la qualité de cette formation, le MINESUP, porté par une volonté d'accroître et de diversifier l'offre de formation médicale nationale, a autorisé certains Instituts Privés d'Enseignement Supérieur à ouvrir des formations dans la filière médicale afin d'atteindre l'objectif de formation de 500 médecins/an ; 150 pharmaciens/an et 150 odontostotalogues/an.

Cet accroissement de l'offre de formation nationale ne s'est pas toujours accompagné d'une amélioration substantielle de la qualité de formation. On a ainsi pu observer, probablement du fait de l'étroitesse des ressources par rapport aux fortes exigences de la formation médicale, un faible respect des normes et standards internationaux par certains établissements.

En réponse aux multiples observations et récriminations tant de la société que des divers ordres, le MINESUP a mis en place une commission *ad hoc* chargée d'évaluer les facultés de médecine et les IPES reconnus et œuvrant dans le secteur de la formation médicale en vue de proposer des solutions idoines pour la préservation des normes et standards.

A la suite de la restitution des travaux de la Commission *ad hoc* et se fondant sur les recommandations de cette dernière, le MINESUP en accord avec le MINSANTE a ainsi proposé plusieurs actions en vue de la préservation des normes et standards de la formation médicale parmi lesquelles la tenue des assises des programmes de la formation médicale afin d'avoir les mêmes curricula de formation sur toute l'étendue du territoire.

Les phases d'élaboration des programmes harmonisés des filières médicale, pharmacie et odontostomatologie ont suivi le triptyque ci-après :

1- Les séminaires ateliers préparatoires des 15-16 avril 2015 qui se sont adossés sur le **GUIDE DES METIERS ET DES COMPETENCES DANS LES DOMAINES STRATEGIQUES DE L'ECONOMIE ET DU DEVELOPPEMENT DE L'AFRIQUE CENTRALE** publié en avril 2009 par le **PROGRAMME D'APPUI A LA COMPOSANTE TECHNOLOGIQUE ET PROFESSIONNELLE DE L'ENSEIGNEMENT SUPERIEUR (PRO-ACTP)** qui ont permis aux experts, sur la base des programmes des trois filières des différents Etablissements agréés, de jeter les bases du cadrage minimum commun, nécessaire pour une harmonisation acceptée par tous.

2- Les travaux préparatoires des 28-30 avril 2015 qui ont affiné les programmes de chaque filière, par niveau et par semestre.

3- Enfin des comités restreints, par filière, qui ont formalisé la version finale des différents programmes, prêts à être appropriés par chaque Etablissement qui utilisera ainsi sa propre codification des Unités d'Enseignement, les objectifs, les contenus des enseignements et les compétences visés étant les mêmes pour tous. Chaque Etablissement est bien évidemment appelé à insérer des compléments marquant leur spécificité.

In fine, ces programmes harmonisés sont donc le fruit d'une synergie forte d'un aréopage d'experts nationaux, dans la mouvance de la grande réforme institutionnelle du domaine médical impulsé par S.E. Paul BIYA, Chef de l'Etat, qui veut doter notre cher et beau pays d'un plateau technique de haut vol en matière de santé, socle d'une émergence sûre et certaine à l'horizon 2035. Si ces programmes sont bien appliqués, ils viseront à garantir la qualité de la formation médicale, pharmaceutique et odontostomatologique pour un avenir plus serein et plus prospère pour tous les citoyens de notre triangle national.

(é) Prof Jacques FAME NDONGO

COMITE SCIENTIFIQUE

SUPERVISION GENERALE : PR JACQUES FAME NDONGO

COORDINATION GENERALE : PR NGOMO HORACE MANGA

COORDINATION TECHNIQUE : PR DIEUDONNE EMMANUEL PEGNYEMB

CONCEPTION ET REALISATION : UNITE DE GESTION DU PRO-ACTP

COORDONNATEUR GENERAL : PR DIEUDONNE EMMANUEL PEGNYEMB

RESPONSABLE ADMINISTRATIF ET FINANCIER : Mme BEDIBOUNE Lucie

ASSISTANT AU RESPONSABLE ADMINISTRATIF ET FINANCIER : M. ABATE ABATE Modeste

CHARGE DU SUIVI EVALUATION : Mme NDZANA Aline

AGENT ADMINISTRATIF : M. NDOUNGOU Arnaud

CADRE : M. YAYA OUSMANOU

SECRETAIRE : Mme HABIBA ABDOULAYE

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Pr. NGOWE NGOWE M	Membre	FHS/Buéa
Pr. FOALENG Michel	Membre	ISSS/Bagangté
Pr. ADIOGO Dieudonné	Membre	FMSP/Douala
Pr. ZE MINKANDE J	Membre	FMSB/UYI
Pr. LEKE R.J.I	Membre	ISSS/Bagangté
Dr. OMBOTO Sébastien	Membre	ISTM/Nkolondom
Pr. NGOGANG Jeanne	Membre	ISSS/Bagangté
Pr. KUABAN Christopher	Membre	FHS/Buéa
BEDIBOUNE Lucie	Facilitatrice	MINESUP/PRO-ACTP
NDZANA Aline	Facilitatrice	MINESUP/PRO-ACTP

SEMINAIRE-ATELIER DE VALIDATION

NOMS	QUALITE	ETABLISSEMENTS
MEDECINE HUMAINE		
Pr. KUABAN Christopher	Président	FHS/Buéa
Pr. NGOWE NGOWE M	Membre	FHS/Buéa
Pr. FOALENG Michel	Membre	ISSS/Bangangté
Pr. ZE MINKANDE J	Membre	FMSB/UYI
Pr. LEKE R.J.I	Membre	ISSS/Bangangté
Dr. OMBOTO Sébastien	Membre	ISTM/Nkolondom
Pr. HAGBE Paul	Membre	ISTM/Nkolondom
Pr. NGOGANG Jeanne	Membre	ISSS/Bangangté
Pr. EBANA MVOGO Come	Membre	FMSB/UYI
Pr. TETANYE E	Membre	V.P/Ordre National des Médecins
Pr. KAPTUE Lazare	Membre	ISSS/Bangangté
Pr. MOUELLE SONE Albert	Membre	FMSP/UDla

COMITE RESTREINT

NOMS	QUALITE	ETABLISSEMENTS
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Pr. CHOUKEM Siméon	Membre	FHS/Buéa
Pr. LEKE R.J.I	Membre	ISSS/Bagangté
Pr. NGANDEU Madeleine	Membre	FMSB/UYI
UM Salomon Valentin	Sec/Technique	MINESUP
BEDIBOUNE Lucie	Sec/Technique	MINESUP/PRO-ACTP

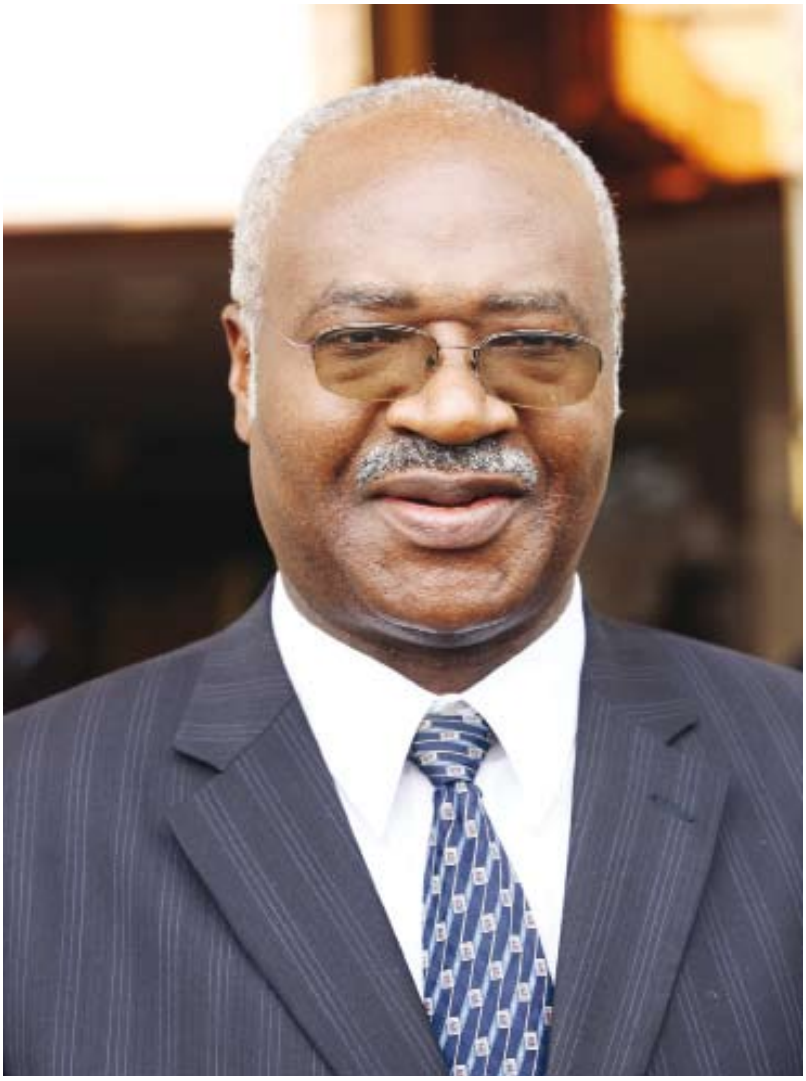
Son Excellence M.

PAUL BIYA

Président de la République, Chef de l'Etat

« Il faut transformer radicalement l'image de l'Enseignement Supérieur au Cameroun »,

(10 février 2008).



Son Excellence M.

PHILEMON YANG

Premier Ministre, Chef du Gouvernement

« Dans l'Enseignement Supérieur, le Gouvernement s'attèle non seulement à augmenter et à diversifier l'offre de formation en faveur des jeunes Camerounais, mais également à assurer la qualité, la pertinence sociale et la professionnalisation des enseignements. Il assure aussi de meilleures conditions de travail et de vie aux membres de la communauté universitaire »

(26 novembre 2013)

Pr. Jacques FAME NDONGO

Ministre de l'Enseignement Supérieur
Chancelier des Ordres Académiques

« Nous devons traduire dans les faits la nouvelle vision de l'Université prescrite par le Chef de l'Etat à travers de profondes mutations qui visent, entre autres, l'amélioration de la qualité des prestations universitaires en matière d'enseignement et de recherche, pour rendre nos universités attractives et compétitives aux plans national, sous-régional et international »,

(Extrait du Discours à l'Université de Yaoundé I, janvier 2010).

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COURSE CODIFICATION TABLES

L=Lectures, T=Tutorials, P=Practicals

YEAR ONE						
FIRST SEMESTER						
	Course title	**L**	**T**	**P**	**Total**	**Credit**
	Human Anatomy 1	45	15	30	90	6
	Human Physiology 1	45	15	30	90	6
	Medical Cytology and Embryology	45	15	30	90	6
	Medical Genetics	15	15	00	30	2
	General Biochemistry and Molecular Biology	30	15	15	60	4
	Biophysics-Technology	20	10	00	30	2
	Ethics and Civic Education	15	00	00	15	1
	ICT 1	15	00	00	15	1
	English for medical profession	15	00	00	15	1
	Français Appliqué aux Sciences de la Santé	15	00	00	15	1
TOTAL 1		**260**	**85**	**105**	**450**	**30**
SECOND SEMESTER						
	Human Anatomy 2	45	15	30	90	6
	Human Physiology 2	45	15	30	90	6
	Microbiology: Bacteriology 1 and Virology 1	20	00	10	30	2
	Microbiology: Parasitology 1 and Mycology 1	20	00	10	30	2
	Histology And Cellular Biology	30	00	15	45	3
	Nursing and first aid 1	20	10	00	30	2
	Social Sciences: Sociology, Anthropology, Psychology	45	00	00	45	3
	Nutrition	30	00	00	30	2
	Environmental Sanitation and Health Promotion	30	00	00	30	2
	Introduction to basic statistics	20	10	00	30	2
TOTAL 2		**305**	**50**	**95**	**450**	**30**

YEAR TWO						
FIRST SEMESTER						
Course Code	**Course title**	**L**	**T**	**P**	**Total**	**Credit**
	Human Anatomy 3	45	15	30	90	6
	Human Physiology 3	45	15	30	90	6
	Systemic Histology 1 and Embryology 1	45	00	15	60	4
	Systemic Biochemistry 1	30	00	15	45	3
	General Haematology, Immunology and oncology	30	15	15	60	4
	General Pharmacology	15	15	00	30	2
	ICT 2	15	00	15	30	2
	Nursing and first aid 2	00	00	45	45	3
TOTAL 1		**225**	**60**	**165**	**450**	**30**
SECOND SEMESTER						
	Human Anatomy 4	45	15	30	90	6
	Human Physiology 4	45	15	30	90	6
	Systemic Histology 2 and Embryology 2	45	00	15	60	4
	Systemic Biochemistry 2	30	00	15	45	3
	General Morbid Anatomy	20	00	10	30	2
	Microbiology: Bacteriology 2 and Virology 2	30	00	15	45	3
	Microbiology: Parasitology 2 and Mycology 2	30	00	15	45	3
	Community Health Practice	00	00	45	45	3
TOTAL 2		**245**	**30**	**175**	**450**	**30**

YEAR THREE						
FIRST SEMESTER						
Course Code	**Course title**	**L**	**T**	**P**	**Total**	**Credit**
	Systemic Morbid Anatomy 1 (Histopathology)	45	15	30	90	6
	Systemic Chemical Pathology 1	30	00	15	45	3
	Clinical and Special Pharmacology 1	60	15	00	75	5
	Clinical Haematology and Immunology	30	00	15	45	3
	Health System Management, Administration and Legislation	30	00	00	30	2

Course Code	Course title	L	T	P	Total	Credit
	Alternative Medicine: Traditional Medicine	20	00	10	30	2
	Clinical Semiology 1: Cardiovascular , Respiratory and Digestive Systems	75	00	15	90	6
	Radiologic Semiology 1	30	00	15	45	3
TOTAL 1		**320**	**30**	**100**	**450**	**30**
SECOND SEMESTER						
	Systemic Morbid Anatomy 2	45	15	30	90	6
	Systemic Chemical Pathology 2	30	00	1500	45	3
	Clinical and Special Pharmacology 2	60	15	00	75	5
	Epidemiology and Applied Biostatistics	60	15	00	75	5
	Clinical Semiology 2: Uro-genital, Haematological and endocrine Systems	45	00	15	60	4
	Clinical Semiology 3: Rheumatological and Neurological systems, Skin and Nails	45	00	15	60	4
	Radiologic Semiology 2	30	00	15	45	3
TOTAL 2		315	45	1575	450	**30**

YEAR FOUR						
FIRST SEMESTER						
Course Code	**Course title**	**L**	**T**	**P**	**Total**	**Credit**
	Internal Medicine 1: Cardiovascular, Respiratory, Endocrine and Digestive Diseases	75	00	00	75	5
	Paediatrics 1: Cardiovascular, Respiratory, Gastro-intestinal and Infectious Diseases	75	00	00	75	5
	Surgery and Anaesthesia 1: General and Visceral Surgery, Anaesthesia and Reanimation	75	00	00	75	5
	Obstetrics and Gynaecology 1: Normal Pregnancy, Antenatal Care, Specific Disorders of Pregnancy and Normal Labour	75	00	00	75	5
	Junior Clinical Rotation Internal Medicine GP1	00	00	60	60	4
	Junior Clinical Rotation Surgery GP1	00	00	60	60	4
	Junior Clinical Rotation in Pediatrics GP2	00	00	60	60	4
	Junior Clinical Rotation in Obs./Gyn GP2	00	00	60	60	4
	Legal and Occupational Medicine	30	00	00	30	2
TOTAL 1		**330**	**00**	**240**	**570**	**30**

SECOND SEMESTER						
	Internal Medicine 2: Neurology, Nephrology, Dermato-venerology and Infectious and Parasitic Diseases	75	00	00	75	5
	Paediatrics 2: Infectious and Parasitic, Gastro-intestinal Didseases, Immunologic, Allergic and Rheumatic, Renal Diseases	75	00	00	75	5
	Surgery 2: Trauma and Plastic Surgery	75	00	00	75	5
	Obstetrics and Gynaecology 2: Disorders of Labour, Normal Puerperium, Puerperal Disorders, Medical and Surgical Disorders of Pregnancy, Operative Procedures.	75	00	00	75	5
	Junior Clinical Rotation Internal Medicine GP2	00	00	60	60	4
	Junior Clinical Rotation Surgery GP2	00	00	60	60	4
	Junior Cinical Rotation in Pediatrics GP1	00	00	60	60	4
	Junior Clnical Rotation in Obstetrics/Gynaecology GP1	00	00	60	60	4
	Community Health (Fieldwork)	00	00	30	30	2
TOTAL 2		**300**	**00**	**270**	**450**	**30**

(*) The students will do two Junior Clinical Rotations per semester according to the groups.

GP1 = Group 1 GP2 = Group 2

YEAR FIVE						
FIRST SEMESTER						
Course Code	**Course title**	**L**	**T**	**P**	**Total**	**Credit**
	Internal Medicine 3: Cardiovascular, Respiratory, Endocrine and Digestive Diseases	75	00	00	75	5
	Paediatrics 3: Neonatology, Haematologic, Endocrine and Metabolic, Neurologic Diseases	75	00	00	75	5
	Surgery 3: Neurosurgery, Vascular Surgery, Urology, Cardiothoracic Surgery and Transplantation	75	00	00	75	5
	Obstetrics and Gynaecology 3: Basic, Childhood and Adolescence, Menstruation, Inability to Conceive and Pelvic Pain	75	00	00	75	5
	Senior Rotation in Internal Medicine GP2	00	00	60	60	4
	Senior Rotation in Paediatrics GP2	00	00	60	60	4
	Senior Rotation in Surgery GP1	00	00	60	60	4
	Senior Rotation in Obstetrics/Gynaecology GP1	00	00	60	60	4
	Research Methodology	20	10	00	30	2
TOTAL 2		**320**	**10**	**240**	**570**	**38**

SECOND SEMESTER						
	Internal Medicine 4: Neurology, Rheumatology and Psychiatry	75	00	00	75	5
	Paediatrics 4: Oncologic, Endocrine and Metabolic Disorders, Neurologic Diseases, Paediatric Emergencies, Child Health Supervision	75	00	00	75	5
	Surgery 4: Breast, Neck and Endocrine Surgery and Orthopaedics	75	00	00	75	5
	Obstetrics and Gynaecology 4: Endometriosis, Uro-gynaecology, Benign Gynaecological Diseases, Gynaecological Oncology, Sexual Disfunction	75	00	00	75	5
	Senior Clinical Rotation Internal Medicine GP1	00	00	60	60	4
	Senior Clinical Rotation in Paediatrics GP1	00	00	60	60	4
	Senior Clinical Rotation Surgery GP2	00	00	60	60	4
	Senior Clinical Rotation in Obs./Gyn GP2	00	00	60	60	4
	Medical Ethics and deontology	15	00	00	15	1
	Health Economy and Demography	15	00	00	15	1
TOTAL 2		**330**	**00**	**240**	**570**	**38**

(*) The students will do two Senior Clinical Rotations per semester according to the groups

GP1 = Group 1 GP2 = Group 2

YEAR SIX						
FIRST SEMESTER						
Course Code	**Course title**	**L**	**T**	**P**	**Total**	**Credit (**)**
	Integrated Medical Practice GP1	00	00	750	750	30
	Housemanship in Internal Medicine GP2	00	00	90	90	6
	Housemanship in Paediatrics GP2	00	00	90	90	6
	Housemanship in Surgery GP2	00	00	90	90	6
	Housemanship in Obstetrics/Gynaecology GP2	00	00	90	90	6
TOTAL 1		**00**	**00**	**1110**	**1110**	**54**
SECOND SEMESTER						
	Integrated Medical Practice GP2	00	00	750	750	30
	Housemanship in Internal Medicine GP1	00	00	90	90	6
	Housemanship in Paediatrics GP1	00	00	90	90	6
	Housemanship in Surgery GP1	00	00	90	90	6
	Housemanship in Obstetrics/Gynaecology GP1	00	00	90	90	6
TOTAL 2		**00**	**00**	**1110**	**1110**	**54**

NB:

1- Courses on **Priority Programmes of the Ministry of Public** Health as well as **Emergency Care and Management of Catastrophes** can be given as Seminars. This should be more so because at the end of the sixth year, the student writes only one National Synthetic Clinical and Therapeutic Exam. He/she does not therefore have semester exams to be marked. These seminars should hold immediately on reopening before students are posted either to the hospital for rotations or to district hospitals for integrated medical practice.

2- It should be noted that in year 6, the number of credits per semester does not add up to 30.

(**) In the sixth year, while Group 1 students are doing Integrated Medical Practice (16 weeks) in District Hospitals in the first semester, Group 2 students will be doing their housemanship rotations (4 weeks each) in the Regional hospital. The reverse will take place in the second semester.

YEAR SEVEN						
FIRST AND SECOND SEMESTER						
Course Code	**Course title**	**L**	**T**	**P**	**Total**	**Credit**
	Research and Dissertation of thesis	**00**	**150**	**600**	**750**	**30**

OBJECTIVES AND CONTENTS OF COURSES BY DEPARTMENT

DEPARTEMENT OF BIOMEDICAL SCIENCES

Human Anatomy 1 6 Credits (45 - 15 - 30)

Objectives: This course is designed to help students master the anatomical structure of the Head, the Neck and the back of the normal human body.

Course Content:

HEAD AND NECK

General description

a) Head: - Major compartments:

Cranial cavity, two orbits, two ears, nasal cavities and oral cavity.

- Other anatomically defined regions: The infratemporal fossa, the pterygopalatine fossa, the face, the scalp

b) Neck: Major compartments

- Vertebral compartment
- Visceral compartment
- Two vascular compartments
- Larynx and pharynx
- Functions of head and neck

c) Component part of the head and neck:

- Skull
- Cervical vertebrae
- Hyoid bone
- Soft palate
- Muscles

d) Relationship to other regions

- Thorax
- Upper limb

e) Key features of head and neck

- Vertebral levels C3/C4 and C5/C6
- Airway in the neck
- Cranial nerves
- Cervical nerves
- Functional separation of the digestive and respiratory passages
- Triangles of the neck

THE SKULL :

- Views: anterior, lateral, posterior, superior, inferior
- Cranial cavity (roof and floor)
- Meninges: Cranial dura mater, Arachnoid mater, Pia mater.

- Arrangement of meninges and spaces.
- Brain and its blood supply.
- Cranial nerves
- Face: Muscles, parotid gland, innervations, vessels.
- Scalp: layers, innervation, vessels, lymphatic drainage
- Orbit (eye):
  - Bony orbit, eyelids,
  - Lacrymal apparatus
  - Sensory innervation
  - Fissures and foramina
  - Facial specialisations
  - Muscles, vessels, innervation
  - Eye ball
- Ear: External, Middle and Internal ears,
- Temporal and infratemporal fossae
  - Bony framework
  - Temporo-mandibular bones
  - Masseter muscles
  - Temporal fossa
  - Infratemporal fossa
- Pterygopalatine fossa
  - Skeletal framework
  - Gateways
  - Contents.

THE NECK:

- Fascia
- Superficial venous drainage
- Anterior triangle of the neck
- Posterior triangle of the neck
- Roots of the neck

- Pharynx:
  - Skeletal framework
  - Pharyngeal wall
  - Fascia
  - Gaps in the pharyngeal wall and structures passing through them
  - Nasopharynx
  - Tonsils
  - Vessels and nerves

- Larynx:
  - Laryngeal cartilages
  - Extrinsic and intrinsic ligaments
  - Laryngeal joints
  - Cavity of the larynx
  - Intrinsic muscles
  - Vessels and nerves
  - Function of the larynx
- Nasal cavities:
  - Lateral wall, regions
  - Skeletal framework
  - Innervation and blood supply
  - External nose
  - Paranasal sinuses
  - Walls, floor and roof
  - Nares, choanae, gateways
  - Vessels and innervation
- Oral cavity:
  - Skeletal framework
  - Walls, the cheeks
  - Floor
  - Tongue
  - Salivary glands
  - Roof-palate
  - Oral fissure and lips
  - Oropharyngeal isthmus
  - Teeth and gingiva
  - Innervation of the oral cavity

THE BACK (VERTEBRAL SPINE)

Overview:

- General description
- Functions
- Component parts: Bones, muscles, vertebral canal, spinal nerves
- Relationship to other organs: Head, thorax, abdomen and pelvis, limbs.

Regional anatomy:

- Skeletal framework: vertebrae, intervertebral foramina, posterior spaces between vertebral arches
- Joints: Joints between vertebrae in the back
- Ligaments:

- Anterior and posterior longitudinal ligaments
- Ligamenta flava
- Supraspinous ligament and ligamentum nuchae
- Interspinous ligaments

- Back musculature
  - Superficial group of back muscles
  - Intermediate group of back muscles
  - Deep group of back muscles
  - Suboccipital muscles
- Spinal cord:
  - Vasculature
  - Meninges
  - Arrangement of structures in the vertebral canal
  - Spinal nerves

Human Anatomy 2 **6 Credits (45 - 15 - 30)**

Objectives: This course is designed to help students master the anatomical structure of the Upper and Lower Limbs of the normal human body.

Course Content:

UPPER AND LOWER LIMBS

A- UPPER LIMB

Over view

- General description
- Functions
  - Positioning the hand
  - Hand as a mechanical tool
  - Hand as a sensory tool
- Component parts
  - Bones and joints
  - Muscles
- Relationship to other organs
  - Neck
  - Back and thoracic wall

Regional anatomy

- Shoulder: Bones, joints and muscles
- Posterior scapular region
  - Muscles
  - Gateways to the posterior scapular region
  - Nerves, arteries and veins
- Axilla:

- Axillary inlet
- Anterior wall
- Medial wall
- Lateral wall
- Posterior wall
- Gateway to the posterior wall
- Floor
- Contents of the axilla

- Arm
  - Bones and muscles
  - Arteries and veins
  - Nerves
- Elbow joint
- Cubital fossa
- Forearm
  - Bones and joints
  - Anterior compartment of the forearm: Muscles, arteries and veins, nerves.
  - Posterior compartment of the forearm: Muscles, arteries and veins, nerves
- Hand:
  - Bones and joints
  - Carpal tunnel and structures at the wrist
  - Palmar aponeurosis
  - Palmaris brevis
  - Anatomical snuff box
  - Fibrous digital sheaths
  - Extensor hoods
  - Muscles
  - Arteries
  - Nervess

B- LOWER LIMB

Overview

- General introduction
- Function: Support body weight, locomotion
- Component parts: Bones and joints, muscles
- Relationship to other organs: Abdomen, pelvis, perineum.

Regional anatomy

- Bony pelvis
- Proximal femur
- Hip joint

- Gateways to the lower limb
- Nerves, arteries, veins and lymphatics
- Deep fascia and the saphenous opening
- Femoral triangle

Gluteal region

- Muscles and nerves
- Arteries, veins and lymphatics

Thigh

- Bones and muscles
- Arteries,veins and nerves
- Knee joint and tibio-fibular joint
- Popliteal fossa

Leg

- Bones and joints
- Posterior compartment of leg
- Lateral compartment of leg
- Anterior compartment of leg

Foot

- Bones and joints
- Tarsal tunnel, retinacula and arrangement of major structures at the ankle
- Arches of the foot
- Plantar aponeurosis
- Fibrous sheaths of toes
- Extensor hoods
- Arteries, veins and nerves

Human Physiology 1 6 Credits (45 - 15 - 30)

Objectives: This course is designed to give students the basic general foundations of normal human physiology.

Course Content:

I. THE CELL AND GENERAL PHYSIOLOGY

- Functional organization of the human body and control of the internal environment
  - Cells as the living units of the body
  - Extracellular fluid – The ''Internal environment''
  - ''Homeostatic'' mechanisms of the major functional systems
  - Control systems of the body
  - Summary – automaticity of the body
- The cell and its functions
  - Organization of the cell

- Physical structure of the cell
- Comparison of the animal cell with precellular forms of life
- Functional systems of the cell
- Locomotion of the cells

- Genetic control of protein synthesis, cell function and cell reproduction
  - Genes in cell nucleus
  - Transfer of the DNA code in the cell nucleus to an RNA code in the cell cytoplasm – The process of transcription
  - Synthesis of other substances in the cell
  - Control of gene function and biochemical activity in cells
  - Control of cell reproduction by the DNA – genetic system
  - Cell differentiation
  - Apoptosis – programmed cell death
  - Cancer

II. MEMBRANE PHYSIOLOGY, NERVE AND MUSCLE

- Transport of substances through the cell membrane
  - The lipid barrier of the cell membrane and cell membrane transport proteins
  - Diffusion
  - Active transport of substances through membranes
- Membrane potentials and action potentials
  - Basic physics of membrane potentials
  - Measuring the membrane potential
  - Resting membrane potential of nerves
  - Nerve action potential
  - Roles of other ions during the action potential
  - Propagation of action potential
  - Re-establishing sodium and potassium ionic gradients after action potential are completed – importance of energy metabolism
  - Plateau in some action potentials
  - Rhythmicity of some excitable tissues – Repetitive discharge
  - Special characteristics of signal transmission in nerve trunks
  - Excitation – the process of eliciting the action potential
  - Recording membrane potentials and action potentials
- Contraction of skeletal muscle
  - Physiologic anatomy of skeletal muscle contraction
  - Molecular mechanisms of muscle contraction
  - Energetics of muscle contraction
  - Characteristics of whole muscle contraction
- Excitation of skeletal muscle: neuromuscular transmission and excitation–contraction coupling

- Transmission of impulses from nerve endings to skeletal muscle fibres: The neuromuscular junction
- Molecular biology of acetylcholine formation and release
- Drugs that enhance or block transmission at the neuro – muscular junction
- Myasthenia gravis causes muscle paralysis
- Muscle action potential
- Excitation – contraction coupling

- Contraction and excitation of smooth muscle
  - Contraction of smooth muscle
  - Nervous and hormonal control of smooth muscle contraction

Human Physiology 2 6 Credits (45 - 15 - 30)

Objectives: This is a continuation of the first semester course.

Course Content:

I. THE BODY FLUIDS

- The body fluid compartment: extracellular fluids, interstitial fluid and oedema
- Factors that balance fluid intake and output during steady state conditions
- Body fluid compartments
- Blood volume
- Constituents of extracellular and intracellular fluids
- Measurement of fluid volumes in the different body fluid compartments – the indicator-dilution principle
- Determination of volumes of specific body fluid compartments
- Regulation of fluid exchange and osmotic equilibrium between intracellular and extracellular fluid
- Basic principles of osmosis and osmotic pressure
- Maintenance of osmotic equilibrium between intracellular and extracellular fluids
- Oedema: Excess fluid in the tissues
- Fluid in the potential spaces of the body
- Distribution of extracellular fluid between the interstitial spaces and vascular system
- Nervous and hormonal factors that increase the effectiveness of renal-body fluid feedback control
- Integrated responses to changes in sodium intake
- Conditions that cause large increases in blood volume and extracellular fluid volume.
- Conditions that cause large increases in extracellular fluid volume but with normal blood volume

II. ACID-BASE REGULATION

- Precise regulation of hydrogen ion concentration
- Definition and meanings of acid and base

- Defending against changes in hydrogen ion concentration: buffers, lungs, kidneys.
- Buffering of hydrogen ion in the body fluid.
- Bicarbonate buffer system; Phosphate buffer system; Proteins as important intracellular buffers.
- Respiratory regulation of acid-base balance.
- Renal control of acid-base balance.
- Secretion of hydrogen ion and reabsorption of bicarbonate ion by the renal tubules.
- Combination of excess hydrogen ion with phosphate and ammonia buffers in the renal tubules to generate new bicar bonate ion.
- Quantifying renal acid base excretion.
- Renal correction of acidoses and alkaloses.

III. METABOLISM AND TEMPERATURE REGULATION

- Metabolism of carbohydrates and formation of adenosine triphosphate (ATP)
- Release of energy from foods and the concept of ''free energy''
- Role of adenosine triphosphate in metabolism
- Central role of glucose in carbohydrate metabolism
- Transport of glucose through the cell membrane
- Storage of glycogen in liver and muscle (Glycogenesis, Glycogenolysis)
- Release of energy from the glucose molecule by the glycolytic pathway
- Release of energy from glucose by the pentose phosphate pathway
- Formation of carbohydrates from proteins and Fats – ''Glucogenesis''
- Blood glucose
- Lipid metabolism
- Transport of lipids in the body fluids
- Fat deposits
- Use of triglycerides for energy formation of adenosine triphosphate
- Regulation of energy release from triglycerides
- Phospholipids and cholesterol
- Protein Metabolism
- Basic properties
- Transport and storage of Amino acids
- Functional role of the plasma proteins
- Hormonal regulation of protein metabolism
- Dietary balances: regulation of feeding: obesity and starvation; Vitamins and Minerals
- Energy intake and output balance under steady state conditions
- Dietary balances
- Regulation of food intake and energy storage
- Obesity
- Inanition, anorexia and cachexia

- Starvation
- Vitamins
- Mineral metabolism
- Energetics and Metabolic rate
- Adenosine triphosphate (ATP)-''Energy currency in metabolism''
- Control of energy release in the cell
- Metabolic rate
- Energy metabolism – Factors that influence energy output

  Basal metabolic rate (BMR)

  Energy used for physical activities

  Energy used for processing food – Thermogenic effect of food

  Energy used for nonshivering – Thermogenesis – Role of sympathetic stimulation
- Body temperature, temperature regulation and fever
- Normal body temperatures
- Balancing heat production against heat loss as a means of control of body temperature
- Regulation of body temperature – role of the hypothalamus
- Abnormalities of body temperature regulation

  Fever

  Exposure of the body to extreme cold

Medical Cytology and Embryology 4 Credits (30 - 15 - 30)

a) MEDICAL CYTOLOGY

Objectives: To permit the student to know the structure of the cell as well as those of its different components.

Course Content:

- Generalities on the cell and common basic structure of all cells
- Cell membranes;
- Transport in and out of the cells
- Cytosol;
- The nucleus;
- Mitochondria;
- Endoplasmic reticulum and Golgi;
- Vesicles;
- Cytoskeleton;
- Cell inclusions and storage products;
- Cell division;
- Cell death.

b) GENERAL EMBRYOLOGY

Objectives: To permit the student to acquire and master the fundamental notions of the

different stages and the mechanisms of the formation and development of the human organism.

Course Content:

- Descriptive embryology
- Gametes and Gametogenesis

  Chromosomes during mitosis, chromosomes during meiosis, modifications during the maturation of germinal cells, spermiogenesis and spermiation, meiosis I and II, polar corpuscles.
- From ovulation to implantation of the egg.
- Constitution of the embryo and its annexae. Implantation and embryonic didermic disc, Gastrulation and tri dermic embryonic envelops, foetal membranes and placenta.
- Development and evolution of foetal circulation.
- Hormones of the foeto-placental unit
- Commencement of organ development, cardio respiratory adaptations to post natal life, teratogenesis, etiologic approach.

MEDICAL GENETICS 2 Credits (15 - 15 - 00)

Objectives:

Permit students to understand and describe the role and genetic medium of hereditary characters with systematic integration of their clinical implications.

Course Content:

- Sequence of the human genome: Consequences for medicine and the society
- Transmission of genetic material I
  - **a.** The cell cycle and mitosis
  - **b.** Cytogenetics: Anatomy of chromosomes, classification of chromosomes: the karyotype.
  - **c.** Meiosis: Reduction division, equational division; consequences of meiosis: reduction, segregation and genetic variability, consequences of non-disjunction.
- Constitutional chromosomic anomalies
  - Main syndromes due to chromosomic aberrations: Autosomic anomalies, trisomy 21, 13, 18.
  - Sexual chromosomic anomalies: Turner's syndrome, Klinefelter's syndrome, Hermaphrodism, Pseudo-hermaphrodism
- Transmission of genetic material II
  - Genealogical tree
  - Mendelian heredity

  a) Dominant autosomic heredity
  - Criteria for the recognition of a dominant autosomic character; theoretical and observed proportions of cases; genetic heterogenicity; allenic genetic heterogenicity; variability of expression, notion of pleiotropism; anticipation dominant gene in the homozygote state.

b) Recessive autosomic heredity
   - Criteria for the recognition of a recessive autosomic character, theoretical proportion of cases.
   - Influence of consanguinity

c) Heredity linked to sexual chromosomes
   - Heredity linked to the X chromosomes: dominant recessive; heredity linked to the Y chromosome.

d) Non-Mendelian Heredity
   - Mitochondrial heredity; uniparental disomia and genomic impression or print.

e) Polygenic/multifactorial heredity

- Elements of population genetics
   - Frequency of genes and genotypes: the equilibrium law of Hardy and Weinberg.
   - Autosomic gene; genes linked to sex: Genetic screening
   - Screening of heterozygotes in recessive autosomic heredity linked to the X-chromosome; theory of the inactivation of the X-chromosome; Haemophilia A and B; Duchenne's disease.
- Analysis of linkage and the localization of genes on the chromosome:
   - Linkage between loci: linkage; interest of linkage; localization of genes on a particular chromosome; migration, selection, mutations.

Tutorials: Medical Genetics

General Biochemistry and Molecular Biology 4 Credits (30 - 15 - 15)

General objective:

To acquaint students with basic notions that will permit them to understand the genesis of several diseases for which the explanation is based on biochemistry (disturbances of metabolic pathways by inhibition or activation of enzymes), and to follow easily the biochemical approaches taught in other domains (Physiology, pharmacology, microbiology molecular biology and genetic engineering).

Specific objectives:

1. Know the structures, physical and chemical properties of some sugars and their derivatives of medical interest.
2. Know the structures, physical and chemical properties of fatty acids, constitutive alcohols of lipids, neutral glycerides and sterides as well as those of complex lipids.
3. Know the structures, physical and chemical properties of the standard amino acids, certain special amino acids and derivatives of amino acids; describe the peptide bond; know the structures, the physico-chemical properties of certain peptides and proteins of biological interest.
4. Define enzyme, know the six different classes of enzymes, describe the active sites of an enzyme and define an enzymatic reaction; study the speed of an enzymatic reaction (allosteric and non-allosteric enzyme), define the thermodynamic conditions of an enzymatic reaction.
5. Know the structure of coenzymes that intervene in energy metabolism, know the mechanism of the synthesis of ATP, give examples of the oxido-reduction couples; describe the steps of glycolysis, beta oxidation and consequent energy outputs; show the

mechanism of main reactions of catabolism of amino acids, describe the mitochondria and the process of oxidative phosphorylation in the mitochondria.

6. Describe the mechanism of energy reserves in the case of carbohydrates (glucides) and lipids.

Course Content:

1. **Structure of carbohydrates (glucides)**
   - Sugars: (structure, physico-chemical properties) aldoses, ketoses (glucose, galactose, mannose, ribose, fructose), Fisher's and Harworth's projections.
   - Derivatives of sugars: acids (glucuronic, gluconic, vitamine C), deoxyribose, sorbitol. Osamines: (flucosamine, galactosamine, mannosamine).

   a. Oligosides (Sacharose).

   b. Polyosides: Starch, glycogen cellulose, dextran.

   c. N-acetylated derivatives: acetylneuramic acid

   d. Heterosides: amyodaloside, manihotoxoside, sinigoside.

   e. Glycosaminoglycans: Hyaluronic acid, chondroitin sulphate, dermatan sulphate, keratan sulphate, heparin, heparin sulphate.

2. **Structure of lipids:**

- Fatty acids: physico-chemical properties, saturated fatty acids, (short chain, medium and long chains), unsaturated (palmitoleic, oleic, linoleic, linolenic, arachidonic), branched, hydroxylated, cyclic.
- Constitutive alcohols of lipids (glycerol, sphingosine, sterols.
- Other compounds (phosphoric acid, sulphuric acid, amino-alcohols; ethanolamine, choline, serine, inositol).
- Simple lipids (cerides, neutral glycerides).
- Complex lipids (phospholipids), lecithins, cephalines, phosphatidyl inositol, phosphatidyl glycerols, phosphatidyl ethanolamine and phosphatidyl serine.

3. **Protides (Amino acids, peptides and proteins):**

- Amino acids: Generalities, structure and physico-chemical properties: solubility, absorption of light, deviation of the light trajectory, ionization; chemical properties: acid function, amine function, deamination reaction with ninhydrin, separation of proteins by chromatography.
- Derivatives of amino-acids: hippuric acid, sarcosine, betaine, carnitine, pyruvic acid, alloisoleucine, norleucine, GABA, phosphoserine, homoserine, phosphothreonine, allothreonine, cysteamine, taurine homocysteine, pyroglutamine, ornithine, citulline, urea, creatinine, hydroxylysine, desmosines, histamine, serotonin, hydroxyproline.
- Peptides: Peptide bonds; Terminal N and C extremities, spectrum of absorption, Biuret reaction and examples of some peptides of biologic interest.
- Proteins: Primary structure, secondary structure, tertiary structure, and quaternary (example carboxypeptidase A and Haemoglobin).

4. **ENZYMOLOGY:**

- Enzyme (definition, active site); notion of zymogen or proenzymes, classification.
- Enzymatic reaction: speed of reaction; reaction phases
- Enzymatic thermodynamics: Activation energy, bond rich in energy, coupled reactions

- Enzyme Kinetics: ones substrate - Effect of enzyme and substrate concentration Michaelis Menten reaction
- Kinetics of two substrates: sequential mechanism, ping pong mechanism.
- Effect of temperature and pH on enzyme catalyzed reactions.
- Types of enzyme inhibition (competitive, non competitive and uncompetitive inhibition), notion of allosterism.

5. METABOLISM:

a) Energy metabolism:

- Coenzyme ATP: co-enzymatic structure and role, synthesis by coupling reaction example of phosphoenol pyruvate, creatine phosphate, 1,3 diphosphoglycerate
- Glycolysis: anaerobic and aerobic, energy balance sheet, Citric acid cycle.
- Oxidation of fatty acids: saturated and unsaturated fatty acids, even and odd chain fatty acid, number of paired and unpaired carbon atoms, energy balance sheet, ketogenesis.
- Catabolism of amino acids: coenzyme PAL, deamination, transamination, decarboxylation reactions; glucose formation and ketogenesis. Transfer reactions of monocarbon radicals, coenzymes THF, cobalamine and some examples, gly/ser, Met/homoserine.
- The respiratory mitochondrial chain: Oxido-reductor couples: NAD/NADH, H^+; Ubiquinone/Ubiquinol; FAD/$FADH_2$, Cytochromes; reactions coupled with oxido-reduction, oxido reduction potentials and energy production; examples of some oxido-reduction couples; mitochondrial organization, theory of the respiratory mitochondrial chain, mitochondrial transporters of NADH and ATP.

b) Metabolism of energy reserves:

- Gluconeogenesis, Glycogenesis, Glycogenolysis, formation of NADPH, pentose phosphate pathway.
- Biosynthesis of saturated, unsaturated unpaired fatty acids. Biosynthesis of triglycerides, cholesterol and glycerophospholipids.

6. MOLECULAR BIOLOGY

- Structure of nucleic acids
  - Nucleosides and nucleotides
  - Ribonucleic acids: primary and secondary structures, tRNA, rRNA, mRNA
  - Deoxyribonucleic acid: primary, secondary and tertiary structures; double helix, super helix, hybridization.
- DNA replication: DNA polymerase, linear and circular DNA, DNA repair, crossing over, types of mutation and the genetic base of disease (example: sickle cell disease).
- Transcription: RNA polymerases, inhibitors of gene transcription, regulation of transcription.
- Translation: The Genetic Code, amino acyl tRNA synthetase, stages of translation: initiation, elongation and termination.
- Introduction to genetic engineering: Application to proteins of therapeutic interest (example-insulin, etc) and analytic interest (monoclonal antibodies), molecular diagnosis and gene therapy.

Histology And Cellular Biology 3 Credits (30 - 00 - 15)

Objectives: The course should permit the student to acquire not only basic knowledge on the main tissues and understand their morphology and functions but also on notions preparing him/her for future integration into the fields of semiology, pathology and therapeutics.

Course Content:

- Epithelial cells (epithelial tissues)
  - Introduction: functions of epithelial cells, classification of epithelial cells.
  - Epithelial cell functions;
  - Epithelial cell surface specialization;
  - Secretory adaptations;
  - Barrier function of epithelium.
- Support cells and the extracellular matrix (connective tissue)
  - Introduction:Characteristics of support cells that distinguish them from other classes of cell, main classes of support cel;
  - Extracellular matrix;
  - Basement membrane and external lamina;
  - Cell adhesion to extracellular matrix;
  - Support cell family.
- Contractile cells:
  - Introduction: main groups of contractile cell;
  - Skeletal muscle;
  - Cardiac muscle;
  - Smooth muscle;
  - Myofibroblasts;
  - Pericytes;
  - Myoepithelial cells.
- Nervous tissue
  - Nerve cells (neurons);
  - Myelin;
  - Central nervous system;
  - Peripheral nervous system
- Blood cells
  - Red blood cells;
  - White blood cells;
  - Platelets;
  - Hemopoiesis;
  - Bone marrow.
- Immune system:
  - Lymphocytes;
  - Macrophages and dentritis cells;

- Bone marrow;
- Thymus;
- Lymph nodes;
- Spleen;
- Mucosa-associated lymphoid tissue.

Biophysics and Technology 2 Credit (20 - 10 - 00)

Objectives: This course is designed to give students theoretical and practical notions on the application of physical sciences (physics) to answer questions of biology.

Course Content:

I. BIOPHYSICS

- Ionizing radiation, physics of X-rays and nuclear medicine
  - Recall: electricity, electronics, structure of matter
  - Production of X-rays and beams of electrons
  - Radioactive transformations, electromagnetic spectrum
  - General properties of X-rays – gamma rays, scintigraphy, SPECIPET, notion of half-life.
  - Interactions with matter, environmental component
  - Sensorial biophysics: vision, audition
  - Biophysics of blood circulation
- Radioprotection and radiology
  - Size and units of dosimetry; distribution of the dose in a beam of X-rays
  - Radiobiology: risk factors
  - Radioprotection: Legislation

II. TECHNOLOGY

- Conventional radiologic imaging: Principles of radiogenic tube, generators and technical parameters
- Construction of a radiologic image: laws of projection, enlarging, deformation constrains.
- Image detector: films, amplifier of brightness
- Scannographic imaging: principles normal and pathologic tissue density, detectors, spiral mode, multi barrets, technical parameters
- Ultra –sound imaging: physics of ultrasounds, properties, production principles, biologic actions of ultrasounds, transductors, advantages of the Doppler effects
- Magnetic resonance imaging: principles, magnetism, radio frequency, relaxation, signal characteristics, security/safety, contra-indications
- Emission imaging: principles of nuclear medicine, PET, radioisotopes tracers
- Laser: Medical applications.

Microbiology: Bacteriology 1 And Virology 1 2 Credits (20-00-10)

Objectives: To provide students with basic knowledge of bacteriology and virology that will be useful for them in the understanding of infectious diseases.

Course Content:

a) Bacteriology:

- Scope and history of microbiology, microscopy,
- Bacterial structure;
- Microbial growth and metabolism;
- Bacterial genetics,bacterial classification;
- Microbial flora (origin and nature, normal flora at different sites of the human body);
- Pathogenesis of bacterial infection;
- Immune response to infection (innate (non-specific) immunity, adaptive (specific) immune system, adverse effects of immunologic reactions), favourable use of the immune response;
- Sterilization, disinfection and infection control;
- Principles of laboratory diagnosis of infectious disease;
- Emergence and global spread of infection;
- Antibacterial agents and resistance.

b) Virology:

- The nature of viruses: Structure and classification;
- Virus replication cycle (absorption or attachment), penetration, entry and uncoating, synthetic or vision component production, ranscription, genome replication, assembly of naked capside viruses and nucleocapsids release, cell death, budding, cell survival;
- Quantitation of viruses;
- Viral genetics (mutation and recombination);the latent state and lysogeny;
- Pathogenesis of viral infection;
  - Transmission and entry, spread in the host, tropism, virulence and cytopathogenicity;
  - Patterns of viral infection and disease;
  - Viral transformation;
  - Host factors and defenses;
  - Adaptive immune responses;
  - Virus-induced immunopathology;
  - Virus-induced immunosuppression;
  - Antibacterial Antimicrobics and Resistance.

Microbiology: Parasitology 1 and Mycology 1 2 Credits (20 - 00 - 10)

a) PARASITOLOGY:

Objectives: The course aims at providing students with the essential details of medical parasitology. It involves the description of various protozoa and helminthes including their geographical distribution, habitat, orphology life cycles and their epidemiology and pathogenecity.

Course Content:

- General parasitology:
  - Definition and classification of parasites (microparasite, macroparasite, ectoparasite, endo-parasites),
  - Notion of host (definitive, intermediate, paratenic, reservoir, compromised), Zoonosis and Vector,
  - Host-parasite relationships (symbiosis, commensalism, parasitism),
  - Sources of infection and portal of entry into the body,
  - Life cycle of human parasites,
  - Immunity in parasitic infections,
  - Laboratory diagnosis of parasitic infections.
- Protozoology:
  - Classification of protozoa.
  - Amoebae.
  - Flagellates (intestinal, oral and genital flagellates as well as blood and tissue flagellates)
  - Sporozoa (malaria parasites, babesia, txoplasma, sarcocyctis, cyclospora, cryptosporidium, isospora, blastocystis).
  - Balantidium coli.
  - Microsporidia.
- Helminthology:
  - Cistodes or tapeworms,
  - Trematodes or flukes,
  - Nematodes I: General characteristics and classification, Trichinella, Trichuris, Strongyloides, hookworms (Ancylostoma, Necator americanus, cutaneous larva migrans, enterobius, vermacularis, and ascaris lumbicoides).

b) MYCOLOGY:

Objectives: The course aims at providing students with the essential details of medical mycology. It involves the general description of the main classes of fungi of medical importance including their geographical distribution, habitat, morphology and their pathogenicity.

Course Content:

- Definition, origin and position of fungi in medicine;
- The main classes of fungi;
- Morphology and cellular organization of a fungus,
- Fungal nutrition and growth;
- Geographic distribution and habitat of fungi;
- Mode of contamination and dissemination of fungi;
- Pathogenic role (fungal virulent factors), host defense mechanism and host's predisposing factors to fungal development;
- Laboratory diagnosis of fungal diseases.

Human Anatomy 3 6 Credits (45 - 15 - 30)

Objectives: This course is designed to help students master the structures of the human body, to appreciate the variation in structure of the human body, so as to be able to appreciate in the higher years of their studies the consequences of malformations, pathologies, or trauma to "normal" structures.

Course Content:

THORAX

Overview

- General description
- Functions: Breathing, protection of vital organs, conduit
- Component parts:
  - Thoracic wall
  - Superior thoracic aperture
  - Inferior thoracic aperture
  - Diaphragm
  - Mediastinum
  - Pleural cavities
- Relationship to other organs
  - Neck
  - Upper limb
  - Abdomen
  - Breast

Regional anatomy:

- Pectoral region
  - Breast
  - Muscles of the pectoral region
- Thoracic wall
  - Skeletal framework
  - Intercostal spaces
- Diaphragm:
  - Venous drainage
  - innervation
- Movements of the thoracic wall and diaphragm during breathing
- Pleural cavities and lungs
  - Pleura
  - Lungs
- Mediastinum and heart
  - Middle mediastinum
  - Superior mediastinum
  - Posterior mediastinum

- Anterior mediastinum
- Heart

ABDOMEN

Overview

- General description
- Functions
- Component parts
  - Wall
  - Abdominal cavity
  - Inferior thoracic aperture
  - Diaphragm
  - Pelvic inlet
- Relationship to other regions
  - Thorax
  - Pelvis
  - Lower limb

Regional anatomy

- Surface topography
  - Four quadrant pattern
  - Nine region pattern
- Abdominal wall
  - Superficial fascia
  - Anterolateral muscles
  - Extraperitoneal fascia
  - Peritoneum
  - Innervation
  - Arterial supply and venous drainage
  - Lymphatic drainage.
- Groin:
  - Inguinal canal
  - Inguinal hernias
- Abdominal viscera
  - Peritoneum
  - Peritoneal cavity
  - Organs
  - Arterial supply
  - Venous drainage
  - Lymphatics
  - Innervation
- Posterior abdominal region
  - Posterior abdominal wall

- Viscera
- Vasculature
- Lymphatic system
- Nervous system in the posterior abdominal region
- Sympathetic trunks and splanchnic nerves.

Human Anatomy 4 6 Credits (45 - 15 - 30)

Objectives: The objectives are same as in the first semester course of Human Anatomy.

Course Content:

PELVIS AND PERINEUM

Overview

- General description
- Functions
- Component parts
  - Pelvic inlet
  - Pelvic Walls
  - Pelvic outlet
  - Pelvic floor
  - Pelvic cavity
  - Perineum
- Relationship to other regions
  - Abdomen
  - Lower limb

Regional anatomy:

- Pelvis
  - Bones and joints
  - Orientation
  - Gender differences
  - True pelvis
  - Viscera
  - Fascia
  - Peritoneum
  - Nerves
  - Blood vessels
  - Lymphatics
- Perineum
  - Borders and ceilings
  - Ischio-anal fossae and their anterior recesses.
  - Anal triangle
  - Urogenital triangle
  - Somatic nerves

- Visceral nerves
- Blood vessels
- Veins
- Lymphatics

Human Physiology 3 6 Credits (45 - 15 - 30)

Objectives: To permit the students to acquire and master the fundamental notions of the normal physiologic functions of the cardiovascular, respiratory and gastro-intestinal systems so as to permit them in future to be able to understand the consequences of diseases on the functioning of these organs.

Course Content:

HEART AND CIRCULATION

- **Heart muscle**: The heart as a pump and functions of the heart valves
  - Physiology of cardiac muscle
  - The cardiac cycle
  - Relationship of the heart sounds to heart pumping
- Rhythmical excitation of the heart
  - Specialized excitatory and conductive system of the heart
  - Control of excitation and conduction in the heart
- The normal electrocardiogramme
  - Characteristics of the normal electrocardiogramme
  - Methods for recording electrocardiogrammes
  - Flow of current around the heart during the cardiac cycle
  - Electrocardiographic leads.
  - Interpretation of the normal Electrocardiogram
- **Overview of the circulation,**

  - Medical physics of pressure, flow and resistance
  - Physical characteristics of the circulation
  - Basic theory of circulatory function
  - Interrelationships among pressure, flow and resistance
- Vascular distensibility and functions of the arterial and venous systems
  - Vascular distensibility
  - Arterial pressure pulsations
  - Veins and their functions
- The microcirculation and the lymphatic system: Capillary fluid exchange, interstitial fluid and lymph flow
  - Structure of the microcirculation and capillary system
  - Flow of blood in the capillaries – vasomotion
  - Exchange of water, nutrients and other substances between the blood and interstitial fluid
  - The interstitium and interstitial fluid

- Factors that determine fluid filtration across capillaries
- Lymphatic system

- Local and humoral control of blood flow by the tissues
  - Local control of blood flow in response to tissue needs
  - Mechanisms of blood flow control
  - Humoral control of circulation
- Nervous regulation of the circulation and rapid control of arterial pressure
  - Nervous regulation of the circulation
  - Role of the nervous system in rapid control of arterial pressure
  - Special features of nervous control of arterial pressure.
- Dominant role of the kidney in long term regulation of arterial pressure and in hypertension
  - Renal-body fluid system for arterial pressure control
  - The renin-angiotensin system and its role in pressure control and in hypertension
- Cardiac output, venous return and their regulation
  - Normal values for cardiac output at rest and during activity
  - Control of cardiac output by venous return-Role of the Frank-Starling mechanism of the heart
  - Methods for measuring cardiac output

RESPIRATION

- Pulmonary ventilation
  - Mechanics of pulmonary ventilation
  - Pulmonary volumes and capacities
  - Minute respiratory volume: relationship between respiratory rate and tidal volume.
  - Alveolar ventilation
  - Functions of the respiratory passage ways (Nose, trachea, bronchi and bronchioles)
- Pulmonary circulation
  - Physiologic anatomy of the pulmonary circulatory system
  - Pressures in the pulmonary system
  - Blood volume of the lungs
  - Blood flow through the lungs and its distribution
  - Effect of hydrostatic pressure gradients in the lungs on regional pulmonary blood flow
  - Pulmonary capillary dynamics
- Physical principles of gas exchange; diffusion of oxygen and carbon dioxide through the respiratory membrane
  - Physics of gas diffusion and gas partial pressures
  - Composition of alveolar air – Its relation to atmospheric air
  - Diffusing of gases through the respiratory membrane

- Effect of the ventilation – perfusion ratio on alveolar gas concentration

- Transport of oxygen and carbon dioxide in blood and tissue fluids
  - Transport of oxygen from the lungs to the tissues
  - Transport of carbon dioxide in the blood
  - Respiratory exchange ratio
- Regulation of respiration:
  - Respiratory center
  - Chemical control of respiration
  - Peripheral chemoreceptor system for control of respiratory activity- rule of oxygen in respiratory control.
  - Regulation of respiration during exercise
  - Other factors that affect respiration

GASTRO – INTESTINAL SYSTEM.

- General principles of gastro – intestinal function –Motility, nervous control and blood circulation
  - General principles of gastro – intestinal mobility: Physiologic anatomy of the Gastro – intestinal wall
  - Neural control of gastro – intestinal function – Enteric nervous system
  - Functional types of movements of the gastro – intestinal tract
  - Gastro –intestinal blood flow – ''Splanchnic circulation''
- Propulsion and mixing of food in the alimentary tract
  - Ingestion of food (mastication and swallowing)
  - Motor functions of the stomach
  - Movements of the small intestine
  - Movements of the colon
  - Other autonomic reflexes that affect bowel activity
- Secretory functions of the alimentary tract
  - General principles of alimentary tract secretion: anatomical types of glands
  - Basic mechanisms of stimulation of the alimentary tract glands, lubricating and protection properties of mucus, and importance of mucus in the gastro – intestinal tract
  - Secretion of saliva: nervous regulation of salivary secretion
  - Oesophageal secretion
  - Gastric secretion
  - Pancreatic secretion
  - Secretion of bile by the liver, functions of the biliary tree
  - Secretions of the small intestine
  - Secretions of mucus by the large intestine
- Digestion and absorption in the gastro-intestinal tract
  - Digestion of the various foods by hydrolysis
  - Basic principles of the gastro –intestinal absorption

- Absorption in the small intestine
- Absorption in the large intestine: formation of faeces

- Physiologic anatomy of the liver
  - Hepatic vascular and lymph systems
  - Metabolic functions of the liver
  - Measurement of bilirubin in the bile as a clinical diagnostic tool.

Human Physiology 4: 6 Credits (45 - 15 - 30)

Objective: To permit the students to acquire and master the fundamental notions of the normal physiologic functions of the urinary, endocrine/reproductive and nervous systems so as to permit them in future to be able to understand the consequences of diseases on the functioning of these organs.

Course Content:

THE KIDNEYS AND URINARY SYSTEM

- **TUBULAR PROCESSING OF THE GLOMERULAR FILTRATE**
  - Reabsorption and secretion by the renal tubules
  - Active and passive mechanisms of tubular reabsorption.
  - Reabsorption and secretion along different parts of the nephron
  - Regulation of tubular reabsorption
  - Use of clearance methods to quantify kidney function

- **URINE FORMATION BY THE KIDNEYS**

1. Glomerular filtration, renal blood flow and their control
   - Multiple functions of the kidneys in homeostasis
   - Physiologic anatomy of the kidneys
   - Micturition
   - Physiologic anatomy and nervous connections of the bladder
   - Transport of urine from the kidney through the ureters and into the bladder
   - Filling of the bladder and bladder wall tone, the cystometrogram
   - Micturition reflex
   - Urine formation – process
   - Glomerular filtration: First step in urine formation
   - Determinants of the glomerular filtration rate (GFR)
   - Renal blood flow
   - Physiologic control of glomerular filtration and renal blood flow
   - Autoregulation of GFR and renal blood flow
2. Tubular reabsorption and secretion
   - Renal tubular reabsorption and secretion
   - Passive and active mechanism of tubular reabsorption
   - Reabsorption and secretion along different parts of the nephron
   - Regulation of tubular reabsorption

- Use of clearance methods to quantify kidney function

3. Urine concentration and dilution; regulation of extracellular fluid osmolarity and sodium concentration.
   - Excretion of excess water by forming dilute urine
   - Conservation of water by excreting concentrated urine
   - Quantifying renal urine concentration and dilution: "free water" and osmolar clearances
   - Control of extracellular fluid osmolarity and sodium concentration
   - Osmoreceptor – ADH feedback system
   - Importance of thirst in controlling extracellular fluid osmolarity and sodium
4. Integration of renal mechanisms for control of blood volume and extracellular fluid volume
   - Regulation of Potassium excretion and potassium concentration in extracellular fluid
   - Control of renal calcium excretion and extracellular calcium ion concentration
   - Control of renal magnesium excretion and extracellular magnesium ion concentration.
   - Integration of renal mechanisms for control of extracellular fluid
   - Importance of pressure natriuresis and pressure dieresis in maintaining body sodium and fluid balance

ENDOCRINOLOGY AND REPRODUCTION

- Introduction to endocrinology
  - Coordination of body functions by chemical messengers
  - Chemical structure and synthesis of hormones
  - Hormone secretion, transport and clearance from blood
  - Mechanisms of action of hormones
  - Measurement of hormone concentration in the blood
- Pituitary hormones and their control by the hypothalamus
  - Pituitary gland and its relation to the hypothalamus
  - Hypothalamus control of pituitary secretion
  - Physiologic functions of growth hormone
  - Posterior pituitary gland and its relation to the hypothalamus
- Thyroid metabolic hormones
  - Synthesis and secretion of the thyroid metabolic hormones
  - Physiologic functions of the thyroid hormones
  - Regulation of the thyroid hormone secretion
  - Diseases of the thyroid
- Adrenocortical hormones
  - Synthesis and secretion of adrenocortical hormones
  - Functions of the mineralo corticoids – Aldosterone
  - Functions of the Glucocorticoids

- Adrenal androgens
- Abnormalities of adrenocortical secretion
- Insulin, Glucagon and Diabetes mellitus
  - Insulin and its metabolic effects
  - Glucogon and its functions
  - Inhibition of glucagon and insulin secretion by somatostatin
  - Summary of blood glucose regulation
  - Diabetes mellitus - overview
- Parathyroid hormone, calcitonin, calcium and phosphate metabolism, vitamin D, bone and teeth
  - Overview of calcium and phosphate regulation in the extracellular fluid and plasma
  - Bone and its relation to extracellular calcium and phosphate
  - Vitamin D
  - Parathyroid hormone
  - Calcitonin
  - Summary of control of calcium ion concentration
  - Pathophysiology of parathyroid hormone, Vitamine D and bone disease.
  - Physiology of the teeth
- Reproductive and hormonal functions of the Male (and function of the Pineal Gland)
  - Physiologic anatomy of the male sexual organs
  - Spermatogenesis
  - Male sexual act
  - Testosterone and other male hormones
  - Pineal gland – its functions
- Female physiology before pregnancy and female hormones
  - Physiologic anatomy of the female sexual organs
  - Female hormonal system
  - Monthly ovarian cycle; Function of the Gonadotropic hormones
  - Functions of the ovarian hormones – Oestradiol and Progesterone
  - Regulation of the female monthly rhythm interplay between the ovarian and Hypothalamic – Pituitary Hormones
  - Abnormalities of secretion by the ovaries
  - Female sexual act
  - Female fertility
- Pregnancy and Lactation
  - Maturation and fertilization of the ovum
  - Early nutrition of the embryo
  - Functions of the placenta
  - Hormonal factors in pregnancy
  - Response of the mother's body to pregnancy

- Parturition
- Lactation

THE NERVOUS SYSTEM:

GENERAL PRINCIPLES AND SENSORY PHYSIOLOGY

- Organization of the Nervous system, Basic functions of the Synapses, "Transmitter substances".
  - General design of the central Nervous system
  - Major levels of the Central Nervous System Functions
  - Central nervous system synapses
  - Some special characteristics of the synaptic transmission
- Sensory receptors, Neuronal circuits for processing information
  - Types of sensory receptors and the stimuli they detect
  - Transduction of sensory stimuli into nerve impulses
  - Nerve fibres transmitting different types of signals and their physiologic classification
  - Transmission of signals of different intensity in nerve tracts – spatial and temporal summation
  - Transmission and processing of signals in neuronal pools
  - Instability and stability of neuronal circuits
- Somation sensations I: General organization, the tactile and position senses
  - Classification of somatic senses
  - Detection and transmission of tactile sensations
  - Sensory pathways for transmitting somatic signals into the central nervous system
  - Transmission in the dorsal column – medial system lemniscal
  - Transmission of less cortical sensory signals in the anterolateral pathway
  - Some special aspects of somatosensory function
- Somatic sensation II: pain, headache and thermal sensations
  - Types of pain and their qualities - fast pain and slow pain
  - Pain receptors and their stimulation
  - Dual pathways for transmission of pain signals into the central nervous system
  - Pain suppression (''Analgesia'') system in the brain and spinal cord
  - Referred pain
  - Visceral pain
  - Thermal sensations
- The special senses
- The eye: Optics of vision
  - Physical principles of optics
  - Optics of the eye
  - Ophthalmoscope

  - Fluid system of the eye – intraocular fluid
- The eye: receptor and neural function of the retina
  - Anatomy and function of the structural elements of the retina
  - Photochemistry of vision
  - Colour vision
  - Neural function of the retina
- The eye: central neurophysiology of vision
  - Visual pathways
  - Organization and functions of the visual cortex
  - Neuronal patters of stimulation during analysis of the visual image
  - Fields of vision, perimetry
  - Eye movements and their control
  - Autonomic control of accommodation and papillary aperture.
- The sense of hearing
  - Tympanic membrane and the ossicular system
  - Cochlea
  - Central auditory mechanisms
  - Hearing abnormalities
- The chemical senses
  - Sense of taste
  - Sense of smell
- The motor functions of spinal cord, the cord reflexes
  - Organization of the spinal cord for motor functions
  - Muscle sensory receptors-muscle spindles and Golgi Tendon organs- and their roles in muscle control
  - Flexor and the withdrawal reflexes
  - Crossed extensor reflex
  - Reciprocal inhibition and reciprocal innervations
  - Reflexes of posture and locomotion
  - Scratch reflex
  - Spinal cord reflexes that cause muscle spasm
  - Autonomic reflexes in the spinal cord
  - Spinal cord transection and spinal shock.
- The cortical and brain stem control of motor function
  - Motor cortex and corticospinal tract
  - Role of the brain stem in controlling motor function
  - Vestibular sensations and maintenance of equilibrium
  - Functions of brain stem nuclei in controlling subconscious, stereotyped movements
- Contribution of the cerebellum and basal ganglia to overall motor control
  - Cerebellum and its motor functions

- Basal ganglia – their motor functions
- Integration of the many parts of the total motor control system.

- The cerebral cortex, intellectual functions of the brain, learning and memory
  - Physiologic anatomy of the cerebral cortex; functions of specific cortical areas
  - Function of the brain in communication – language input and language output
  - Function of the corpus callosum and anterior commissure to transfer thoughts, memories, training and other information between the two cerebral hemispheres
  - Thoughts, consciousness and memory
- The behavioral and motivational mechanisms of the brain – the limbic system and the hypothalamus
  - Activating – driving systems of the brain; limbic system
  - Functional anatomy of the limbic system, key position of the hypothalamus
  - Hypothalamus, a major control headquarters for the limbic system
  - Specific functions of other parts of the limbic system
- States of brain activity – sleep, brain waves, epilepsy, psychoses
  - Sleep, Epilepsy, Psychotic behavior and dementia – roles of specific neurotransmitter systems
  - Schizophrenia of part of the dopamine system.
- The automatic nervous system and the adrenal medulla
  - General organization of the autonomic nervous system
  - Basic characteristics of sympathetic and parasympathetic function
  - Autonomic reflexes; stimulation of discrete organs in some instances and mass stimulation in other instances by the sympathetic and parasympathetic systems
  - Pharmacology of the autonomic nervous system.
- Cerebral blood flow, cerebrospinal fluid and brain metabolism

Systemic Histology 1 and Embryology 1 4 Credits (45 - 00 - 15)

Objectives: In continuity of knowledge gained in the first year, this course should permit the student to concretely master in a thematic way the main tissues of the mature or developing human body, and thus prepare him/her well to understand morbid anatomy in future.

Course Content:

- Blood and lymphatic circulatory systems and the heart:
  - Blood circulatory system: systemic blood vessels (large elastic arteries, muscular arteries, arterioles, capillaries, venules, veins);
  - Lymphatic circulatory system;
  - The heart: Epicardium, myocardium, endocardium, pericardium, heart values, the conducting system of the heart.
- Respiratory system;

- Upper respiratory tract, larynx;
- Trachea and bronchial tree;
- Distal respiratory tract: alveoli, alveolar macrophages;
- Pulmonary vasculature
- Pleura.

- Alimentary tract, Pancreas, and liver
  - Oral cavity and its contents;
  - Teeth;
  - Dentinogenesis and odontoblasts;
  - Gums, salivary glands;
  - Pharynx (oro an nasopharynx);
  - Oesophagus;
  - Stomach;
  - Small intestine;
  - Appendix;
  - Large intestine;
  - Anal canal;
  - Exocrine pancreas;
  - Liver vasculature;
  - Hepatocytes and their functional organization;
  - Intrahepatic biliary tree;
  - Gall bladder.
- Urinary system
  - Kidney structure, function and vasculature;
  - Renal microcirculation;
  - Nephron;
  - Glomerulus;
  - Glomerular filtration barrier;
  - Mesanguim;
  - Tubular and collection system;
  - Renal interstitium;
  - Lower urinary tract.

General Haematology, Immunology and Oncology 4 Credits (30 - 15 - 15)

Objectives: To enable students acquire knowledge on blood cells and blood clotting and to acquaint students with the concept of immunity as well as immunological disorders.

Course Content:

a) Blood cells

- Red blood cells (Erythrocytes): Production of red blood cells, Formation of haemoglobin, Iron metabolism, Life span and destruction of red blood cells.

- Leukocytes (White blood cells): General characteristics, Genesis of white blood cells, Neutrophils and macrophages and their role in the defense against infections and in inflammation, Lymphocytes, Monocyte and Macrophage cell system (reteculo-endothelial system), Eosinophils, and basophiles.

b) Blood types, transfusion and organ transplantation

- ABO blood types: A and B antigens (Agglutinogens), Agglutinins, Agglutination process in transfusion reactions, Blood typing.
- Rh blood types: Rh immune responses
- Transfusion reactions resulting from mismatched blood types.
- Transplantation of tissues and organs, Attempts made to overcome immune reaction in transplanted tissues.

c) Hemostasis and blood coagulation

- Events in hemostasis, Mechanism of blood coagulation

d) Immunity and allergy

- The immune system:
  - Cellular components – lymphocytes and macrophages.
  - Immunoglobulin: structure, classification and functions
  - Complement system.
- Types of immune reactions and their relation to human disease
- The HLA system
- Suppression of immune reactions or of their effects

e) Oncology

- Epidemiology and aetiology (risk factors) of cancers
- Pathology: Benign and malignant tumours
- Tumour markers
- General clinical features of malignant tumours
- General principles of treatment of malignant tumours.
  - Staging and evaluation of performance status
  - Principles of radiotherapy
  - Principles of chemotherapy
  - Principles of endocrine therapy
  - Terminal care
- Principles of primary and secondary prevention of cancer
- Principles of cancer screening

Systemic Histology 2 and Embryology 2 4 Credits (45 - 00 - 15)

Objectives: In continuity of knowledge gained in the first year, this course should permit the student to concretely master in a thematic way the main tissues of the mature or developing human body, and thus prepare him/her well to understand morbid anatomy in future.

Course Content:

a) Histology

- Musculoskeletal system
  - Skeletal muscle;
  - Muscle attachments;
  - Bone, bone cells, mineralization of osteoid, bone modeling;
  - Joints.
- Endocrine system:
  - Pituitary: anterior and posterior
  - Hypothalamus;
  - Pneal gland;
  - Thyroid gland;
  - Parathyroid gland;
  - Adrenals: adrenal cortex, adrenal medulla;
  - Exocrine pancreas;
  - Diffuse neuroendocrine system
- Male reproductive system
  - Testes: Seminiferous tubules, sertoli cells, testicular interstitium;
  - Vas deferens;
  - Seminal vesicles;
  - Prostate;
  - Bulbo-urethral glands;
  - Penis.
- Female reproductive system
  - Mons pubis, labia, majora and labia minora;
  - Clitoris, vagina;
  - Uterus : cervix, uterine body, uterine tubes;
  - Ovary;
- Skin and breast
  - Skin : Epidermis, dermis, subcubitus, skin appendages;
  - Breast : Mammary duct and lobule system

b) Embryology:

- Musculoskeletal system: Development of the musculo-skeletal system
- Endocrine system: development of the hypothalamus, pituitary glands, adrenals, exocrine pancreas, thyroid and parathyroid glands;
- Reproductive system: Development of te male and female reproductive organs;
- Skin and breast: Development of skin and breast.

Systemic Biochemistry 1 3 Credits (30 - 00 - 15)

Objectives:

- To permit the student to acquire knowledge in biochemistry that contributes in the maintenance of homeostasis of the internal milieu in the following systems: 1) Haematopoietic system; 2) Cardiovascular system; 3) Respiratory system; 4) Digestive system.
- To prepare him/her to better understand by comparison chemical pathology taught in the third year.

Course Content:

Haematopoietic system:

- Porphyrins: structure and nomenclature, synthesis (SHEMIN Cycle) and catabolism of Haem.
- Hemoglobin: structure, mechanisms in play for the fixation of oxygen, oxygen saturation, Bohr's effect, 2,3-DPG effect, transconformation of deoxy and oxy; some abnormal haemoglonins.
- The Red Blood Cell: Metabolism of iron and erythrocytes
- The complement system: Complement activation and pathways.
    - Practicals/Tutorials: Electrophoresis of haemoglobin (done in haematology), measures of blood bilirubin levels.

Cardiovascular system:

- Plasma proteins: classifications, qualitative and quantitative methods of analysis; Albumins, globulins, study of globulins according to their function: transport, markers of inflammation, tumour markers, antiproteases, immunoglobulins.
- Lipoproteins: structure, classification, metabolism, methods of exploration of lipids and lipoproteins.
- Serum enzymes: Methods of analysis, plasma specific enzymes of clinical significance: Creatine Kinase, Lactate Dehydrogenase, Aspartate Aminotransferase, Alanine Aminotransferase, Alkaline Phosphatase, Acid Phosphatase, □-Glutamyltransferase, Amylase Lipase, Glucose-6-Phosphate Dehydrogenase, Sorbitol dehydrogenase

Practicals: Serum proteins' electrophoresis Determination of enzymatic activity of some plasma enzymes: ALAT, ASAT, CK

Respiratory system:

- Mineral elements of the Human organism: macro and micro elements, notion of blood electrolytes.
- Acid base equilibrium:
- Blood gases: composition of air, dissolved and fixed oxygen, Haemoglobin saturation, Dissolved and fixed CO_2

Practicals: Measuring of some macroelements (Chlorine, Calcium) and blood gases.

Digestive system:

- Saliva: volume, composition, role in digestion
- Gastric and pancreatic juices: volume, enzymatic composition and their role in digestion
- Liver and biliary secretions: volume, composition of bile, biosynthesis of bile salts,

entero-hepatic cycle. Liver detoxifications: xenobiotics and hydroxylation, oxidation, dehydrogenation, deamination, de-alkylation, reduction, hydrolysis dehalogenation, transsulfuration, conjugation reactions.

- Intestinal secretions: ionic and enzymatic composition, role in digestion, stool formation.

Practicals: Measure of serum amylase.

Systemic Biochemistry 2 3 Credits (30 - 00 - 15)

Objectives: To permit the student to acquire knowledge in biochemistry that contributes in the maintenance of homeostasis of the internal milieu in the following systems: 5) Urinaty system; 6) Endocrine system; 7) Reproductive system; 8) Nervous system.

Course content:

Urinary system:

- Composition of urine: Organoleptic characteristics: Volume, odour, density, superficial tension, pH; mineral constituents: organic: Urogenesis, ammoriagenesis, creatinine and uric acid synthesis, urinary amino acids, oxalic, and hippuric acid, urinary proteins.
- Abnormal constituents: Glucose, proteins, ketone bodies, salts and pigments, hemoglobin and blood.
- Water metabolism: distribution, origin. Function and hormonal regulation by vasopressin and aldosterone via the rennin-angiotensin system.

Practicals:

- Search for abnormal substances in urine, Dosage of urea and urinary and serum creatinine, clearance calculation.

Endocrine system:

- Generalities on hormones and chemical messengers: Definition, second messengers, amplification mechanisms and regulation, cascade reactions of the hormonal system; hormone receptors.
- Structure and synthesis of hormones: peptide hormone, hormones derived from amino acids, steroid hormones.
- Hormones of the digestive tube: Insulin, glucagon, somatostatin, gastrin, secretin, CCK.
- Thyroid and parathyroid hormones: T3, T4, metabolism of vitamin D
- Medullo-supra adrenal hormones: Catecholamines
- Hypothalmo – Hypophyseal hormones: ACTH, TSH, FSH, LH, MSH, Prolactin
- Renal Hormones: Renin, angiotensin

Practicals: Dosage of T3, T4, TSH by immune enzymatic method. Dosage of blood glucose level.

Reproductive system:

- Steroid Hormones: Generalities, Mineralo-corticosteroids. Glucocorticoid steroids, androgens, oestrogens, progesterone.
- Placental hormones: Lactogenic hormones, chorionic somatotrophins placental steroids.

Nervous system:

- CSF: Organoleptic characteristics, composition in ionic and organic substances, Pathologic CSF

- Lipid-glucide metabolism: role of glucose and complex lipids of the nervous system.
- Metabolism of amino-acids: synthesis of neurotransmitters: dopamine, adrenaline, noradrenaline, melanin, octopamine, phenylpyruvate, serotonin, histamine, acetyl choline, catabolism of catecholamines and acetylcholine;

- The eye and vision: metabolism of carotenes and vitamin A. The aqueous and vitreous humours; tears and lysozyme; Sensory transduction in vision.
- Muscle contraction: contractile proteins, smooth muscles, striated muscles: microscopic structure, myosin, tropomyosin, troponins; Molecular mechanism of muscle contraction; Control of muscle contraction.

Microbiology: Bacteriology 2 and Virology 2 3 Credits (30 - 00 - 15)

Objectives: In continuity of knowledge gained in the first year, this course will provide students with the basic knowledge of bacteria and viruses that cause infectious disease.

Course Content:

a) Bacteriology: Pathogenic bacteria

- Staphylococci;
- Streptococci and Enterococci;
- Corynebacterium, listeria and Bacillus;
- Mycobacteria;
- Actinomyces and Nocardia;
- Clostridium, Peptostreptococcus: Bacteroides and other Anaerobes;
- Neisseria;
- Haemophilus and Bordetella;
- Vibrio, Campylobacter and Helicobacter;
- Enterobacteriaceae;
- Legionella;
- Pseudomonas and other opportunistic Gram-negative Bacilli;
- Plague and other Bacterial Zoonotic Diseases;
- Spirochetes;
- Mycosplasma and Ureaplasma;
- Chlamydia;
- Rickettsia, Coxiella and Bartonella;

b) Virology: Pathogenic viruses

- Influenza, Para-influenza, Respiratory synctial virus, Adenovirus and other Respiratory viruses;
- Mumps virus, Measles, Rubella and other childhood Exanthems;
- Poxviruses;
- Enteroviruses;
- Hepatitis viruses;
- Herpes viruses;
- Viruses of Diarrhoea;
- Arthropod-Borne and other Zoonotic viruses;

- Rabies;
- Retroviruses: Human T-lymphotropic virus, Human Immunodeficiency virus and Acquired Immunodeficiency Syndrome;
- Papilloma and Polyoma viruses;
- Persistent viral Infections of the Central Nervous Systems:

Microbiology: Parasitology 2 and Mycology 2 3 Credits (30 - 00 - 15)

Objectives: This course is a continuation of the course that was given in the first year. It will also acquaint students to applied parasitology diagnostic procedures in medical parasitology as well as to medically important arthropods.

Course Content:

c) Parasitology

- Nematodes II: Visceral larva migrans, filarial nematodes (Wuchiris bancrafti, Brugia malayi,loa loa, onchocerca volvulus, etc), other nematodes (Dracunulus medinensis);
- Parasitic opportunistic infections in AIDS cases:
  - Toxoplasma gondii
  - Cryptosporidium parvum
  - Isospora belli
  - Microsporidia
  - Entamoeba histolytica
  - Giardia lambria
  - Cyclospora cayetanensis
  - Leishmania spp
  - Strongyloides stericoralis
- Nosocomial parasitic infections
  - Nosocomial gastro-intestinal infections
  - Nosocomial blood and tissue infections
  - Nosocomial infections in the paediatric patient
- Diagnostic procedures
  - Examination of faeces,
  - Examination of urine,
  - Examination of sputum,
  - Examination of aspirates,
  - Examination of cerebrospinal fluid,
  - Examination of biopsy material,
  - Examination of blood
  - Culture methods
- Medically important arthropods
  - Insects: Mosquitoes, sandflies, beetles, Redwid bugs, fleas, lice, other biting flies, midges
  - Arachnids: Ticks, other arthropods.

d) Mycology

– **Classification of human fungal infections**

- **Superficial**: Dermatophytes - Dermatophytosis (**Epidermophyton** as *E. floccosum* causing *Tinea corporis* (ringworm), *Tinea cruris* (jock itch), *Tinea pedis* (athlete's foot) and *Tinea unguium* or Onychomycosis (a fungal infection of the nail bed); ***Microsporum*** and ***Trichophyton***), thrush (Candida species), dandruff (Pityrosporum)
- **Subcutaneous**: eg, mycetoma
- **Systemic**: pathogenic (*Histoplasma*) or opportunistic (*Aspergillus*) fungi

– **Description of the infection cause by a dermatophyte**

– **Causes of human fungi infection**

- **Yeast**: *Candida spp* (*Candida albicans*), *Cryptococcus neoformans* (Cryptococcosis: distribution, mode of infection), ***Pneumocystis pneumonia*** or **Pneumocystosis** (a form of pneumonia, caused by the yeast-like fungus *Pneumocystis jirovecii)*.
- **Mould** (filamentous): *Aspergillus* (*Aspergillus fumigatus* such as *Neosartorya fumigata*), *Penicillium, Fusarium, Scedosporium*
- **Dimorphic fungus** (can exist as mold/hyphal/filamentous form or as yeast): *Histoplasma capsulatum*

– **Invasive fungal infection**

- The main causative agents for morbidity and mortality in immunocompromised patients (*Candida spp*: Candidiasis, *Aspergillus spp*: Aspergillosis)
- Emerging infectious fungi (*Fusarium spp*: Fusariosis., *Scedosporium spp*., Zygomycetes: zygomycosis such as *Mucor spp*: Mucormycosis)

– **Diagnosis & clinical management**: Microscopy, Culture, Serology, Radiography, PCR

– **Treatment & Prevention**

Pneumocytosis (Pneumocystis jirovecii)

General Morbid Anatomy 2 Credits (20 - 00 - 10)

Objectives: The course will permit students to acquire and master structural particularly histological abnormalities of cells and tissues due to disease.

Course Content:

- Definition and scope of morbid anatomy (histopathology);
- Cellular adaptation to disease;
- Cell injury and death;
- Tissue responses to injury: overview, acute inflammation, chronic inflammation;
- Developmental and geneticdiseases: developmental disorders, genetic factors in disease, cytogenetic abnormalities and disease, gene defects and disease, molecular genetics and disease;
- Neoplasia:Characteristics and terminology of neoplastic diseases, tumour nomenclature and classification, biology of neoplasia, diagnosis of neoplasia;
- Basic immunopathology: Immunological factors in disease;
- Environmental and nutritional factors in disease: mechanical trauma damage

from extremes of temperature, damage from irradiation, electrical injury, chemical damage, nutritional factors in disease.

General Pharmacology 2 Credits; (15 - 15 - 00)

Objectives: This course is meant to acquint the students with the principles of pharmacology and mechanisms of drug action.

Course Content:

Pharmacology: definition and uses

Receptors and receptor mediated mechanisms of transmitter and drug action

Components and classification of drug action

Tolerance to drug effects

Pharmacogenomics and pharmacogenetics and drug responses

Pharmacokinetics: the biological basis of pharmacokinetics

Pharmacokinetics: the mathematical basis of pharmacokinetics

Factors affecting pharmacokinetics, pharmacogenomics/pharmacogenetics and drug kinetics.

Drug discovery, ssafety and efficacy: drug discovery, drug approval, establishing safety and efficacy (preclinal studies), post-marketing surveillance phase (phamacovigilance)

Systemic Morbid Anatomy 1 (Histopathology) 6 Credits (45-15-30)

Objectives: The course should permit students to acquire and master structural modifications of cells, tissues and organs that underlie disease in the following systems: Haematopoietic, Cardiovascular, Respiratory and Digestive. The course will treat specifically specific responses of tissues and organs to more or less well defined stimuli.

Course Content:

- Blood circulatory system: General pathology of the circulatory system, embolism, infarction, shock, arterial diseases (arterosclerosis, atheroma, aneursyms and aortic dissection), vasculitis, structural abnormalities of veins, tumours and malformations of vessels, myocardial infarction, cardiomyopathy and myocarditis, pericarditis, endocarditis and diseases of heart valves;
- Respiratory system: Atelectasis, pulmonary oedema, infective disease of the respiratory system, chronic obstructive pulmonary disease, asthma, diffuse parenchymal lung diseases, pneumoconiosis, granulomatous disease of the lungs, neoplastic disease of the lungs, pathology of the pleura.
- Digestive system: Disease of the oesophagus and oesophago-gastric junction, disease of the stomach, disease of the small and large intestine, malabsorption syndromes, chronic inflammatory bowel disease, tumours of the small and large intestine, pathology of the appendix, diseases of the anal canal and pathology of the peritoneum;
- Liver, biliary tract and pancreas: overview of diseases of the liver, jaundice, vascular diseases of the liver, hepatitis, chronic inflammatory liver disease, toxic liver disease, metabolic liver disease, cirrhosis of the liver, tumours of the liver, diseases of the gall bladder and extrahepatic bile ducts, disease of the exocrine pancreas, tumours of the pancreas;

- Lymphoid and hemopoietic tissues: Diseases of the lymph nodes, neoplastic disease in lymph nodes, Hodgkin's disease, non-Hodgkin's lymphomas, B-cell lymphomas, T-cell lymphomas, diseases of the spleen, neoplastic diseases of white cells, myeloproliferative diseases, histiocytoses.

Systemic Morbid Anatomy 2 6 Credits (45 - 15 - 30)

Objectives: The course should permit students to acquire and master structural modifications of cells, tissues and organs that underlie disease in the following systems: Urinary, Endocrine, Genital, Nervous and the Skin.

The course will treat specifically specific responses of tissues and organs to more or less well defined stimuli.

Course Content:

- Urinary system: Diseases of the kidney, vascular disease and the kidney, glomerular diseases, types of glomerulonephritis, disease of renal tubules and interstitium, tumours of the kidney, cystic disease of the kidney, urinary calculi, tumours of the lower urinary tract;
- Endocrine system: Pituitary, thyroid gland, parathyroids, adrenal, pancreatic endocrine tissue, ovary and testis, multiple endocrine neoplasia syndromes;
- Genital system:
  - Male: testicular tumours, single pattern, germ cell tumours, prostate gland, penis;
  - Female: Diseases of the vulva, diseases of the vagina, diseases of the cervix, diseases of the endometrium, diseases of the myometrium, diseases of the fallopian tubes, diseases of the ovaries, neoplastic disease of the ovaries;
- Breast disease: Inflammatory disorders of the breast, benign diseases of the breast, neoplastic breast diseases, malignant tumours of the breast;
- Nervous System and Muscle: Brain ischaemia and infarction, spontaneous intracranial haemorrhage, hydrocephalus, syringomyelia, demyelinatino diseases, neurodegenerative diseases, phakomatosis tumours of nervous system (of meningeal and neuro-epithelial origin), non neuro-epithelial tumours of the CNS, muscle diseases;
- Skin: Dermatitis, tumours of the skin, tumours of ski appendages, tumours and tumour-like enlargements o fthe dermis, important miscellaneous skin condition;
- Important multisystem diseases: Systemic lupus erythematosus, progressive systemic sclerosis, systemic vasculitis, rheumatoid disease, sarcoidosis, diabetes mellitus, amyloidosis.

Clinical Haematology, Immunology 3 Credits (30 - 00 - 15)

Objectives: To permit the student to master the main diseases of blood and the immune system.

Course Content:

- Diseases of the red blood cells
  - Anaemias: due to blood loss, due to inadequate production of red cells, due to excessive red cell destruction.
  - Erythrocytosis and polycythaemia, other myeloproliferative disorders.
- Diseases of the white blood cells and the monocyte macrophage system
  - Neutropenia and agranulocytosis

- The leukaemias: acute leukaemias, chronic leukaemias (chronic myeloid, chronic lymphatic)
- The lymphomas: Hodgkin's lymphoma, non-Hodgkin lymphoma, Burkitt's lymphoma.
- Multiple myeloma (myelomatosis) and Waldenstrom's macroglobulinaemia

- Haemorrhagic diseases
  - Due to defect of the blood vessels: vascular purpuras, hereditary haemorrhagic telangiectasis
  - Due to disorders of blood platelets
  - Due to defects of the clotting mechanism: hereditary (haemophilia A and B, Von Willibrand's disease, etc) or acquired
- Thrombosis and disseminated intravascular coagulation
- Immunodeficiency disorders
  - Combined deficiency states
  - Deficiency of humoral immunity: primary and secondary immunoglobulin deficiency
  - Deficiency of cellular immunity: primary and secondary cellular deficiency
  - Deficiency of complement
  - Auto-immune disease.

Systemic Chemical Pathology 1 3 Credits (30 - 00 - 15)

Objectives: This course will offer students chemical clinical and pathologic notions permitting them to understand prescribe and interpret results of chemical pathology. It will also enable them to more clearly understand physiopathologic mechanisms of some metabolic diseases.

Course Content:

Requests for laboratory investigation; collection, processing and preservation of specimen for investigation; Notion on reference values, SI units

Biochemistry of inflammation:

- Definition and description of the main stages: induction, extravasation of fluids, cellular infiltration, generalization, cicatrization or passage to chronicity;
- Factors of inflammation. Special case of Prostaglandins: synthesis, nomenclature, and mechanism of action.

Haematopoietic system:

- Disorders of iron metabolism (haemochromatosis)
- Types of Anaemia and laboratory investigations (microcytic anaemia, normocytic and macrocytic anaemia, etc),

Cardiovascular system

- Infarction: biochemical mechanism of the apparition of infarction
- Lipids and vascular pathology: definition of atherosclerosis, privilege role of lipoproteins and cholesterol in atheroma formation; Plasma lipid profile
- Diabetes and vascular disorders: different forms of diabetes, symptomatology of diabetes mellitus, complications
- Effect of glycation of proteins, vascular complications.

Respiratory system:

- Metabolic disorders during acidosis and alkalosis; Henderson and Hasselbach equation, acidosis, alkalosis, different disorders
- Notion of compensation and decompensation.
- Exploration: Appreciation of the respiratory and metabolic components.
- Major syndromes of metabolic acidosis. Diabetic keto-acidosis, uremic acidosis, lactic acidosis, alcohol intoxication, Methanol and Salicylic acidosis.

Digestive system:

- Digestive secretions of gastro-intestinal tract: Exploration of the gastric function (Study of gastric acid and enzymatic secretion)
- Exploration of the exocrine pancreas: direct tests: eg test of secretin; indirect tests in plasma, urine and stools.
- Exploration of the hepatic function:

  Bile functions and its anomalies; biochemical basis for the exploration of cholestasis and jaundice

  Metabolic functions of the liver: (Carbohydrate, lipids, proteins, bilirubin and alcohol metabolism)

  Exploration of the functions of purification and detoxication

  Liver function tests, jaundice – hepatocellular and obstructive

Systemic Chemical Pathology 2 3 Credits (30 - 00 - 15)

Objectives: This course will offer students chemical clinical and pathologic notions permitting them to understand prescribe and interpret results of chemical pathology. It will also enable them to more clearly understand physiopathologic mechanisms of some metabolic diseases.

Course Content:

Urinary system:

- Exploration of the renal function: static exploration in blood (creatinine, urea, sodium, potassium, chlorine, osmolality) and in urine (proteins, glucides, sodium, potassium, chlorine calcium, osmolality)
- Dynamic exploration:

  Exploration of the glomerular function - Clearance tests: Inulin clearance, Creatinine clearance test, Urea clearance test.

  Exploration of the proximal tubule, Loop of Henle and the distal tubule - Specific gravity of urine, measurement of osmolality, Concentration and dilution tests,;

  Exploration of the functioning of the kidneys in the control of the acid-base equilibrium - Urinary acidification with NH_4Cl, Fractional excretion of bicarbonate load, Fractional excretion of sodium, Fractional excretion of phosphates.

Endocrine system:

- Static and dynamic exploration of the endocrine system, detectors, effectors and reactors, first and second messengers
- Thyroid functions and investigation of thyroid disorders
- Hypothalamic–Hypophysial hormones and investigation of their disorders

- Adrenal gland hormones and investigation of their disorders
- Assessment of gonad function in men and wom

Nervous system:

- Metabolism of carbohydrates and consequences of some common inborn errors of metabolism – galactosaemia, lactose intolerance,
- Metabolism of amino acids associated with psychiatric syndromes
- Metabolism of purines and pyrimidines; Associated disorders of metabolism; e. g Lesh-Nyhan syndrome, gout, alcaptonuria.
- Metabolism of lipids: Sphingolipidoses.

Clinical and Special Pharmacology 1 5 Credits (60 - 15 - 00)

Objectives: To acquaint students with a rational pharmacologic basis of drugs used in the treatment of diseases of the different body systems or organs: Cardiovascular, Respiratory, Hematopoietic and Digestive as well as infectious diseases.

Specific objectives:

- Describe the main classes of drugs;
- Give at least an example of each class or subclass of drugs, describe their mode of action; describe their presentation and pharmacokinetics, their indications and contra indications, their side effects, and interactions with other drugs or substances.

Course Content:

The different classes of drugs used in the treatment of diseases of the following

1. Infectious and Parasitic diseases.

- Antibacterial drugs:
  - Drugs affecting the cell wall: □-lactams antibacterials:Penicillins,cephalosporins, monobactams, carbapenems, etc.
  - Drugs affecting bacterial DNA: Quinolones, metronidazole and linidazole.
  - Drugs affecting bacterial protein synthesis: Macrolides, aminoglycosides, tetracyclines, tigecyclines, chloramphenicol, lincosamides, fusidic acid, streptogramins, oxazolidinones.
  - Drugs affecting bacterial metabolism: sulphonamides, trimethoprim.
  - Drugs used for tuberculosis: Isoniazids, rifamycins, pyrazinamide, ethambutol.
  - Drugs used for leprosy: Dapsone, clofazimine.
- Antiviral drugs:
  - HIV reverse trancriptase inhibitors.
  - Non-nucleoside reverse transcriptase inhibitors.
  - HIV protease inhibitors.
  - HIV binding-fusion-entry inhibitors.
  - CCR5 co-receptor antagonists.
  - HIV integrase inhibitors.
  - Viral RNA polymerase inhibitors.
  - Non-nucleoside analogue DNA polymerase inhibitors.

- Drug for treating influenza virus: M2ion channel inhibitors, neuraminidase inhibitors, immuno-modulators, palivizumab.

- Anti-parasitic drugs
  - Antimalarial drugs: Quinine, mefloquine, pyrimethamine, proguanel, Arthemeter with lumefantrine, primaquine, amodiaquine.
  - Other anti-protozoal drugs: Atovaquone, pentamidine, sodium stibogluconate, diloxamide furoate.
  - Anti-heminthic drugs: Ivermectin benzimedazoles, piperazine, neclosamide praziquantel.
- Antifungal drugs:
  - Polyenes (amphotericin, nystatin).
  - Imidazoles (clotrimazole, ketoconazole, miconazole).
  - Triazoles (fluconazole, itraconazole, voriconazole).
  - Terbinafine.
  - Echinocandins
  - Flucytosine
  - Griseofulvin

2. Drugs of the cardiovascular system

- Drugs for ischaemic heart disease: organic nitrates, beta-adrenoceptor antagonists (□-blockers), calcium channel inhibitors, potassium channel openers, specific sinus node inhibitors, late sodium current inhibitors.
- Antihypertensive drugs.
  - Drugs acting on the sympathetic nervous system.
  - Beta-adrenoceptor antagonists (□-blockers).
  - Alpha-adenoceptor antagonists (α-blockers).
  - Centrally acting anti-hypertensive drugs: selective imidazoline receptor agonists, centrally acting α_2-adrenoceptor agonists.
  - Drugs affecting the renin-agiotensin system: Angiotensin-converting enzyme (ACE) inhibitors, angiotensin receptor antagonists, direct renin inhibitors.
  - Vasodilators: Diuretics, calcium channel blockers (calcium antagonists) potassium channel openers, hydralazine nitrovasodilators.
- Drugs for treating of heart failure
  - Digitalis glycosides: digitoxin, digoxin.
  - Sympathomimetic ionotropes.
  - Phospho diesterase inhibitors.
- Drugs for treating cardiac arrhythmias.
  - Classification of anti-arrythmic drugs.
  - Class 1A drugs: Disopyramide, procainamide, quinidine.
  - Class 1B drugs: Lidocaine
  - Class 1C drugs: Flecainide, propafenone.
  - Class II drugs: Beta-adrenoceptor antagonists (□-blockers).
  - Class III drugs: Amiodarone, sotalol.
  - Class IV drugs: calcium channel blockers (calcium antagonists).

- Other drugs for cardiac rhythm disturbances: Digitalis glycosides, adenosine, atropine, magnesium sulphate.

- Drugs for peripheral vascular disease: cilostazol, naftidrofuryl oxalate.
- Drugs for hyperlipidaemias: HMG- CoA reductase inhibitors (statins), specific cholesterol absorption inhibitors (ezetimide) bile-binding (anion-echange) renins, fibrates, nicotinic acid and derivatives. Omega – 3 fatty acids.

3. Drugs for the respiratory system

- Symptom-relieving drugs for airflow obstruction (Bronchodilators):
  - Beta$_2$-adrenoceptor agonists (short acting: salbutamol, terbutaline; long acting: formoterol, salmetrol).
  - Antimuscarinic agents: Ipratropium tiotropium.
  - Methylxanthines: aminophylline, theophylline.
- Anti-inflammatory drugs for airways obstruction:
  - Corticosteroids (beclomethasone dipropionate, budesonide, fluticasone propionate, hydrocortisone, mometasone prednisolone).
  - Cromones (sodium cromoglycate, nedocromil sodium). Leukotriene receptor antagonists, (montelukast, zafiriukast).
  - Magnesium sulphate
  - Antibody to Immunoglobulin E (IgE).
- Drugs for the treatment of cough
  - Antitussives (cough suppressants).
  - Expectorants and mucolytics.

4. Drugs of the gastro-intestinal system

- Anti-emetic agents:
  - Anti-histamines: cyclizine, promethazine.
  - Antimuscarinic agents: hyoscine.
  - Dopamine receptor antagonists.
  - 5HT$_3$ receptor antagonists.
  - Neurokinin receptor antagonists
  - Cannabinoids, corticosteroids, benzo-diazepines.
- Drugs for treating dyspepsia, peptic ulcer and gastro-oesophageal disease:
  - Anti-secretory drugs: proton-pump inhibitors, histamine H_2 receptor antagonists.
  - Anti-acids
  - Cytoprotective drugs: sucralfate, bismuth salts, prostaglandin analogues.
  - Prokinetic drugs: metoclopramide.
- Drugs for inflammatory bowel disease (ulcerative colitis, Crohn's disease).
  - Amino salicylates (balsazide, mesalazine, olsalazine, sulfa-alazine
  - Corticosteroids.
  - Cytokine inhibitors (TNF α-antibodies)
- Laxatives: bulking agents, osmolic laxatives, irritants and stimulant laxatives, faecal softneners.
- Drugs for treating diarrhoea: opioids.

- Antispasmodics: antimuscarinic drugs and other antispasmodic agents
- Drugs for liver disease.
  - Drugs for treatment of viral hepatitis: Interferon alfa, nucleoside analogues.
- Drugs for treatment of obesity.
  - Drugs acting on the gastro-intestinal track, methylcellulose, orlistat.
  - Centrally acting appetit suppressants: serotonin and noradrenaline reuptake inhibitors, endocannabinoid receptor antagonists.

5. Drugs for the haematopoietic and immune systems.

- Anaemia and haematopoietic colony stimulating factors
  - Iron, Folic acid, vitamin B12;
  - Erytropoietin;
  - Granulocyte colony stimulating factors
- Antiplatelet drugs: cyclo-oxygenase inhibitors, phosphodiesterase inhibitors ADP receptor antagonists, glycoprotein IIb/IIIa receptor antagonists.
- Anticoagulant drugs: heparins, vitamin K antagonists, direct factor XA inhibitor.
- Fibrinolytic (thrombolytic) agents.
- Antifibrinolytic and haemostatic agents.
- Immunosuppressant drugs: calci-neurin inhibitors (ciclosporin, tacrolimus) mTor (target of rapamycin) inhibitors, antiproliferative agents (Azathioprine, mycophenolate mofetil), interleukin 2-receptor antibodies.
- Antihistamines.

Clinical and Special Pharmacology 2 5 Credits (60-15-00)

Objectives: To acquaint students with arational pharmacologic basis of drugs used in the treatment of diseases of the different body systems or organs: Endocrine, Uro-genital and Nervous.

Specific objectives:

- Describe the main classes of drugs;
- Give at least an example of each class or subclass of drugs, describe their mode of action; describe their presentation and pharmacokinetics, their indications and contra indications, their side effects, and interactions with other drugs or substances.

Course Content:

The different classes of drugs used in the treatment of diseases of the following:

I. ENDOCRINE SYSTEM:

- Drugs for the control of blood sugar: Insulins and insulin analogues, othe hypoglycaenic drugs, drugs to increase plasma levels of glucose
- Drugs for treatment of hyperthyroidism: The thionamides (carbimazole, propyltheoaracil)
  - Drugs for the management of hypothyroidism (levothyroxine, liothyronine)
  - Drugs for the treatment of hypercalcaemia: Bisphosphonates, cacitonin,
  - Drugs for the treatment of hypocalcaemia: Vitamin D compounds.

- Pituitary and hypothalamic hormones: Growth hormones for therapeutic use (somatropin), drugs for acromegaly (somatostatin analogues, Growth hormone receptor antagonists, dopomaine recemtor antagonists, ACTH for therapeutic use (tetracosactide, Gonadotrophin-releasing hormone (GnRH)) related products for therapeutic use (synthetic GnRH), GnRH antagonists, Gonadotrophins for therapeutic use, drug treatment for female infertility (clomifene).
- Posterior pituitary hormones: Vasopressen (antidiuretic hormone), vasopressin analogues, vasopressin V2 receptor antagonist;
- Corticosteroids (glucocrticoids and mineralocorticoids).
- Female reproduction: Steroidal contraceptives, hormone replacement therapy and other drugs used for postmenopausal conditions, drugs used for inducing labour (oxytocin, dinoprostone), drugs for induction of abortion (prostaglandin derivatives) and for treating postpartum haemorrhage (ergometrin).
  - Myometrial relaxants (tocolytics)
- Androgens and anabolic steroids: Male sex hormones (testosterone, danazol) anabolic steroids (nandrolone, oxymethalone), anti-androgens (Bicalutamide and flutamide), 5α-reductase inhibitors (dutasteride, finasteride).

II. UROGENITAL SYSTEM

- Diuretic drugs: proximal tubular diuretic (carbonic anhydrase inhitors), Osmotic diuretics (mannitol), loop diuretics (bumetanide, furosemide), thiazide and thiazide-like diuretics (bendroflumethiazide, chlortalidone, metolazone), potassium sparing diuretics (amiloride, eplerenone, spironolactone, triamterene).
- Disorders of micturition and erectile dysfunction: drugs for treatment of over active bladder (muscarinic receptor antagonists), drugs for the treatment of prostatism (alpha1-adrenoreceptor antagonists, 5-alpha reductase inhibitors).
  - Drugs for treatment of erectile dysfunction: oral phosphodiesterase inhibitors, other vaso-dilators.

III. NERVOUS SYSTEM

- General anaesthetics: mechanisms of action of general anaesthetics, drugs used in anaesthesia (intravenous anaesthetics, intravenous opioids, inhalatimal anaesthetics), local anaesthetics.
- Opioid analgesis and the management of pain (non steroidal anti-inflammatory drugs), opioid analgesics, non opioid non-NSAID agents used for analgesia, pain management).
- Anxiolytics, sedatives and hypnotics
- Antipsychotic and mood stabilizing drugs.
- Antidepressant drugs and drugs for attention deficit hyperactivity disorder and narcolepsy.
- Anti-epileptic drugs
- Drugs for Parkinson's disease and for other involuntary movement disorders
- Drugs for migraine

IV. RHEUMATOLOGY

- Non steroid anti-inflammatory drugs, drugs for the treatment of gout

V. IMMUNE SYSTEM

- Immunosuppressant drugs

VI. Drugs for Topical application on the skin and eyes.

DEPARTMENT OF CLINICAL SCIENCES

Clinical Semiology 1 **6 Credits (75-00-15)**

Objectives:

To permit the student to acquire knowledge on the different symptoms and signs of disease in the different systems of the body in a bid to enable him/her in their future clinical years to take good medical histories and perform appropriate physical examination of patients.

Content:

- The general principles of history taking.
- The general principles of physical examination.

THE CARDIOVASCULAR SYSTEM (CVS):

- Presenting symptoms in CVS disease: chest pain, dyspnoea, ankle swelling palpitations, syncope and presyncope, dizziness, intermittent claudication, fatigue.
- Risk factors for CVS disease
- CVS examination:
  - General appearance
  - Examination of the hands: finger clubbing, splinter haemorrhages, Osler's nodes, Janeway lesions, tendon xanthomata.
  - Arterial pulse: rate, rhythm, radio-femoral delay, character and volume, condition of the vessel wall.
  - Blood pressure: measurement, variations in blood pressure, high and low blood pressure, postural blood pressure.
  - Examination of neck vessels: the carotid arteries and jugular veins (jugular venous pressure and pulsation).
  - Examination of the praecorduim (inspection, palpation, percussion auscultation).
  - Normal heart sounds and abnormalities of heart sounds, murmurs of the heart.
  - Examination of lower limbs for oedema and peripheral vessels.
- **Correlation of physical signs and cardiovascular disease:** Cardiac failure (left ventricular failure, right ventricular failure, global heart failure); Myocardial infarction, pulmonary embolism; Acute aortic dissection; Acute and chronic constrictive pericarditis; Acute cardiac tamponade; Valve diseases of the heart; Cardomyopathies: Hypertrophic and dilated.
- The chest x-ray and the heart.

THE RESPIRATORY SYSTEM:

- Presenting symptoms in respiratory disease: cough and sputum, haemoptysis, dyspnoea (acute, progressive or paroxysmal), wheeze, chest pain, mediastinal pain.
- Risk factors for respiratory disease.
- Examination of the respiratory system:
  - General appearance and assessment.
  - Respiratory rate, breathing patterns.
  - Use of accessory muscles, stridor, hoarseness and cyanoses.

- Finger clubbing and hypertrophic pulmonary osteoarthropathy, discoloration of the fingers and nails, tremor.

- Examination of the thorax.
  - Inspection (abnormalities in the shape of the chest (kyphosis and scoliosis, barrel chest, pectusexcavatum, pectuscarinatum).
  - Palpation (determining the position of the mediastinum, chest expansion).
  - Percussion (normal and abnormal notes).
  - Auscultation (normal breath sounds, bronchial breathing and added sounds, crackles, wheeze, pleural friction rub, pneumothorax click.

- **Correlation of physical signs and respiratory disease:** Consolidation or lobar pneumonia, Lung collapse, Pleural effusion, Pneumothorax, Bronchiectasis, Bronchial asthma, Emphysema and chronic bronchitis, Pulmonary fibrosis, Mediastinal syndromes.

THE GASTRO-INTESTINAL SYSTEM

- Presenting symptoms of gastro-intestinal disease: abdominal pain, appetite and weight change, early satiation and post prandial fullness, nausea and vomiting, heart burn and acid regurgitation, dysphagia, diarrhoea, constipation, mucus in stool, bleeding (haematemesis and melena), jaundice, abdominal bloating and swelling.
- The gastro-intestinal examination.
  - General appearance: jaundice, weight loss and wasting, examination of skin for pigmentation due to liver disease etc, the hands and the palms.
  - Examination of the salivary glands and the mouth (breath, lips, gums, tongue).
    - x Inspection: scars, distension, prominent veins, striae, bruising, pigmentation, localized masses, visible peristalsis.
    - x Palpation: superficial (tenderness, rigidity, outline of abdominal mass), deep (organomegaly): liver, spleen, kidney and abnormal masses.
    - x Percussion: liver, spleen, ascites (shifting dullness).
    - x Auscultation: bowel sounds, bruits, hums, rubs.
  - Examination of the groins: Hernias (inguinal, femoral and incisional hernias).
  - Examination of the acute abdomen
  - Rectal examination: inspection and palpation
- **Correlation of physical signs and gastrointestinal disease**: Liver disease: portal hypertension, hepatic encephalopathy; Dysphagia; Assessment of gastrointestinal bleeding: assessing degree of blood loss, determining the possible bleeding site; Malabsorption.

Clinical Semiology 2 4 Credits (45-00-15)

Objectives: To permit the student to acquire knowledge on the different symptoms and signs of disease in the different systems of the body in a bid to enable him/her in their future clinical years to take good medical histories and perform appropriate physical examination of patients.

Content:

- **THE URO-GENITAL SYSTEM:**

  a) Urinary system

  - Presenting symptoms: Dysuria and urogenital pain, frequency and urgency, polyuria, nocturia, oligo/anuria, pneumaturia, abnormal urine flow, incontinence, enuresis, haematuria, proteinuria, renal colic.

- The physical examination of the renal system:
  - General features: skin, circulation and eyes.
  - Abdominal examination: palpation of the kidney and bladder, percussion of the bladder, auscultation of the abdomen.
- Examination of the urine.
  - Macroscopic examination: colour, transparency, smell, specific gravity.
  - Biochemical analysis: pH, proteins, glucose and ketones, blood, nitrites.
  - Urine sediment: red blood cells, white blood cells, cast.

b) Genital system and breast:

- Presenting symptoms of breast disease: breast lump, breast pain (mastalgia), skin changes, nipple changes (nipple inversion, nipple discharge), gynaecomastia.
- Examination of the breast: inspection and palpation.
- Presenting symptoms of the genital system:

  Menstruation and abnormalities (oligomenorrhoea, primary amenorrhoea, secondary amenorrhoea, menorrhagia, flooding, dysmenorrhea, menarche, precocious puberty, menopause, post menopausal bleeding, dyspareunia, pelvic masses, incontinence, loss of libido, impotence, infertility, genital rash and ulcers, urethral or vaginal discharge.
- Physical examination of the male genitalia: inspection, palpation: Hydroceles, spermatoceles, varicoceles, epididymitis, urethritis, orchitis, unilateral testicular atrophy, bilateral testicular atrophy, a single testis, phimosis, erectile dysfunction, testicular pain, torsion of the testis.
- Pelvic examination: inspection of the external genitalia (looking for rashes, ulcerations, warts, scars, sinus openings etc), inspection of the clitoris, urethra and vaginal outlet (looking for discharges, vaginal atrophy).
- Vaginal touch and bimanual examination of the uterus.
- Speculum examination.
- Examination of the anogenital region and prostate.

- **<u>THE HAEMATOLOGICAL SYSTEM:</u>**
  - Presenting symptoms of haematological disease: symptoms of anaemia (weakness, tiredness, dyspnoea, fatigue, postural dizziness), bleeding, easy bruising, purpura, thrombo-embolic tendency, jaundice, lymph node enlargement, bone pain, paraesthesia, skin rash, weight loss
  - The haematological examination
    - General appearance: pallor, bruising, scratch marks.
    - Examination of the hands: koilonychias, pallor of the palmar creases, pulse purpura.
    - Examination of lymph nodes: epitrochlear, axillary, cervical and supraclavicular nodes, inguinal nodes.
    - Examination of legs and bones: bone tenderness, neurological abnormalities, Henoch-Schonlein purpura, leg ulcers etc.
    - Examination of the abdomen: splenomegaly.
  - **Correlation of physical signs and haematological disease:** Anaemia, Pancytopenia, Acute leukaemia, Chronic leukaemia, Myeloproliferative disease, Polycythaemia, Myelofibrosis, Essential thrombocythaemia, Lymphoma, Multiple myeloma.

- **THE ENDOCRINE SYSTEM**
  - Presenting symptoms in endocrine disease: appetite and weight changes, changes in bowel habit, changes in sweating, changes in hair distribution, lethargy, skin changes, changes in pigmentation, stature changes, erectile dysfunction (impotence), galactorrhoea, menstruation and amenorrhoea, polyuria.
  - The endocrine examination.
    - The thyroid gland: inspection, palpation, percussion, auscultation, Pemberton's sign, hyperthyroidism (thyrotoxicosis), hypothyroidism.
    - The pituitary gland: panhypothyroidism, acromegaly.
    - The adrenals: Cushing's syndrome, Addison's disease.
    - The parathyroid gland: primary hyperparathyroidism, hypoparathyroidism.
    - Syndromes associated with short stature: general inspection, Turner's syndromes (45 x 0), Down's syndrome (Tresomy 21) achondroplasia.
    - Hirsutism, gynaecomastia.
    - Diabetes mellitus
    - Paget's disease (osteitis deformans)

Clinical Semiology 3 4 Credits (45-00-15)

Objectives: To permit the student to acquire knowledge on the different symptoms and signs of disease in the different systems of the body in a bid to enable him/her in their future clinical years to take good medical histories and perform appropriate physical examination of patients.

Content:

- **THE RHEUMATOLOGICAL SYSTEM**
  - Presenting symptoms in rheumatological disease
    - Peripheral joints: pain and swelling, morning stiffness, deformity, instability, change in sensation.
    - Back pain, limb pain, Raynaud's phenomenom, dry eyes and mouth, red eyes.
  - The rheumatological examination
    - General inspection
    - Principles of joint examination: look, feel, move, measure.
    - Assessment of individual joints: the hands and wrists, the elbows, the shoulders, the temporo-mandibular joints, the neck, the thoraco-lumbar spine, the hips, the knees, the ankles and feet.
  - **Correlation of physical signs and rheumatological disease:** Rheumatoid arthritis: the hands, wrists, elbows, shoulders and axillae, the eyes, parotids, mouth, temporo-mandibular joints, the neck, the chest, lower limbs, ankles and feet; Seronegatives pondyloarthropathies: ankylosing spondylitis, Reiter's syndrome, psoriatic arthritis, enteropathic arthritis; Gouty arthritis, pseudogout; Systematic lupus erythematosus; Scleroderma; Soft tissue rheumatism: fibromyalgia syndrome, shoulder syndromes, rotator cuff syndrome, frozen shoulder, elbow epicondylitis, tenosynovitis of the wrist, bursitis: Nerve entrapment syndromes: carpal tunnel syndrome, meralgia paraesthetica, tarsal tunnel syndrome, Morton's metatarsalgia.

- **THE NERVOUS SYSTEM INCLUDING ENT AND OPHTALMOLOGY:**
  - Presenting symptoms of neurological disease: headache and facial pain, faints

and fits, dizziness, visual disturbances and deafness, disturbances of gait, disturbed sensation or weakness in the limbs, tremor and involuntary movements.

- The neurological examination:
  - General examination including examination for neck stiffness, assessment of the higher centres, speech and abnormal movements.
  - The cranial nerves II to XII
  - The upper limbs, Motor system: inspection tone, power, reflexes, coordination; sensory system: pinprick sensation, proprioception, vibration sense, light touch.
  - The lower limbs, Motor system: inspection, tone, power, reflexes, coordination; sensory system: pinprick sensation, proprioception vibration sense, light touch.
  - The skull and spine for local disease.
  - The carotid arteries for bruits.
- **Correlation of physical signs and neurological disease:** Upper motor neurone lesions, Lower motor neurone lesions: motor neurone disease, peripheral neuropathy, Guillain-Barre syndrome, thickened peripheral nerve; Spinal cord compression; Important spinal cord syndromes: Brown-Sequard syndrome, subacute combined degeneration of the cord (vitamin B12 deficiency, dissociated sensory loss, syringomyelia, extensor plantar reponse plus absent knee and ankle jerks, myopathy, dystrophiamyotonica, myasthenia gravis; The cerebellum, Parkinson's disease; Other extrapyramidal movement disorders (dyskinesia): chorea, dystonia;
  - Examination of the unconsciousness patient.

- **THE SKIN AND NAILS**
  - General principles of physical examination of the skin.
  - Dermatological terms: definitions
  - Descriptive terms and their definitions.
  - Approach to the clinical diagnosis of a lump.
  - **Correlation of physical signs and skin disease**: Pruritus, Erythrosquamous eruptions, Erythema nodosum, Erythema multiforme, Hyperpigmentation, Flushing and sweating, Skin tumours
  - The nails: onychomycosis, onycholysis paronychia, clubbing, spinterhaemorrhages.

Radiologic Semiology 1 3 Credits (30 - 00 - 15)

Objectives: The course will permit the student to understand and know how to describe the steps in the formation of images according to the different radiological imaging techniques and their consequences. It will also permit them to know the radiological anatomy of each organ according to the different imaging techniques used and know how to describe the conditions under which the techniques are used and their preparation; the risks, constrains and the indications of each examination technique. The student finally will be able to recognize from the imaging reports, the significance of the semiologic elements currently used.

Course Content:

a) Generalities:

- Introduction to radiologic semiology;

- Echographic imaging: formation of the image, basic echographic semiology, echographic interpretation
- Contrast products: principal contrast substances in conventional radiology, CT-SCAN, MRI, echography; incidents and accidents and their prevention and treatment.

b) System imaging

- Cardiovascular system: techniques of exploration and normal results, semiology, Imaging of vessels: techniques of exploration and normal results, semilogy.
- Respiratory system: Thorax: techniques of exploration and normal results. Major syndromes.
- Locomotor system: Exploration techniques, normal results, elementary semiology.

Radiologic Semiology 2 3 Credits (30 - 00 - 15)

Objectives: Same as in Semiology 1.

Course Content:

- Digestive system: Imaging of the digestive tube (oesophagus, stomach, small intestines and colon): Exploration techniques and normal results; semiology of plain abdominal X-ray image; Imaging of the liver, biliary tract, spleen and pancreas: exploration techniques, and normal results, semiology.
- Uro-genital system:

o Urinary: exploration techniques and normal results, semiology

o Male and female genital organs: exploration techniques and normal results, semiology.

- Nervous system:

o Imaging of ENT and brain: exploration techniques and normal results, semiology.

o Imaging of the vertebral spine and spinal cord: techniques and normal results, semiology.

COURSES IN INTERNAL MEDICINE, PAEDIATRICS, SURGERY, OBSTETRICS & GYNECOLOGY, COMMUNITY HEALTH

N.B.: One month of the academic year is dedicated to community health.

Objectives:

1. Offer the student in the domains of Internal Medicine, Paediatrics, Surgery, Obstetrics and Gynaecology the fundamental elements for the diagnosis (positive, differential, aetiologic) of different illnesses as well as their management.
2. Provide the student with aptitudes and attitudes to handle and manage preventive and curative problems of health in communities.

Internal Medicine 1 5 Credits (75 - 00 - 00)

Course Content:

1. **Cardiovascular system**
   - Cardiac arrest, Heart block
   - Disorders of heart rate, rhythm and conduction
   - Acute circulatory failure
   - Chronic heart failure
   - Diseases of heart valves
   - Arterial hypertension
2. **Respiratory System**
   - Lower respiratory tract infections: acute Bronchitis, pneumonia, lung abscess.
   - Tuberculosis.
   - Pleural disease: pleural effusion, empyema thoracis, pneumothorax.
   - Chronic obstructive lung disease: chronic bronchitis, emphysema.
   - Asthma, bronchopulmonary eosinophilia.
   - Bronchiectasis.
   - Bronchial obstruction.
3. **Endocrine System**
   - Diabetes mellitus and other metabolic disorders
   - Presenting problems in hypothalamic and pituitary disease: Hypopituitarism, pituitary tumour, hyperprolactinaemia and galactorrhoea, prolactinoma, acromegaly, diabetes insipidus.
   - The thyroid gland: Thyrotoxicosis, hypothyroidism, Goitres. Thyroid neoplasia.
4. **Digestive System**
   - Gastro-oesophageal reflux disease
   - Acute upper gastrointestinal haemorrhage
   - Gastritis, Peptic ulcer disease and complications
   - Tumours of the stomach
   - Diarrhoea and malabsorption syndrome
   - Jaundice
   - Viral hepatitis
   - Gall stones and acute cholecystitis

Paediatrics 1 5 Credits (75 - 00 - 00)

Course content:

- **Cardiovascular diseases**
  - Heart failure
  - Congenital heart disease

    Acyanotic
    - Left to right shunts: ventricular septal defect, persistant ductus arteriosus, atrial septal defect.
    - Outflow obstruction: pulmonary stenosis, aortic stenosis, oarctation of the aorta

    Cyanotic: tetralogy of Fallot, transposition of the great arteries, atrio-ventricular septal defect (complete).
  - Rhythm abnormalities: premature beats, supraventricular tachycardia.
  - Neurocardiogenic syncope
  - Cardiomyopathy
  - Hypertension
- **Respiratory diseases**
  - Asthma
  - Bronchiectasis and cystic fibrosis
  - Bronchopulmonary dysplasia
  - Apnoea of infancy
  - Congenital malformations: Laryngomalacia, vascular rings, trachea-esophageal fistula, bronchogenic cyst, pulmonary sequestration, pulmonary arterio-venous fistula
  - Pulmonary tuberculosis
- **Gastro-intestinal diseases**
  - Vomiting
  - Acute and recurrent abdominal pain
  - Acute and chronic diarrhoea
  - Constipation
  - Gastro-esophageal reflux and achalasia
  - Pyloric stenosis
  - Peptic ulcer disease
  - Gastro-intestinal hemorrhage
  - Inflammatory bowel disease: ulcerative colitis and Crohn's disease
  - Malabsorption syndrome
  - Protein-calorie malnutrition
- **Infectious diseases**
  - Fever and fever of unknown origin
  - Bacteraemia and sepsis
  - Meningitis and encephalitis, tetanus, poliomyelitis

- Upper airway infections: Otitis, sinusitis, gingivitis and stomatitis, pharyngitis, laryngitis, cervical adenitis, epiglottitis, mumps, infectious mononucleosis, whooping cough.
- Lower respiratory tract infections: bronchiolitis pneumonia
- HIV/AIDS

Surgery & Anaesthesia 1 5 Credits (75 - 00 - 00)

Course content:

1- **Surgical principles:**
   - Preoperative assessment, fluid management, postoperative care, surgical complications, basic surgical principles.

2- **Anaesthesia and pain control**
   - Definition, history and principles of anaesthesia
   - Mechanisms of action of anesthetics.
   - Preoperative preparation.
   - Principles of general anaesthesia.
   - Induction, maintenance and recovery from general anaesthesia.
   - Monitoring and charting the patient under general anaesthesia (patient and machine).
   - Complications of general anaesthesia.
   - Local and regional anaesthesia: mechanisms of action, local toxicity, routes of administration, complications.
   - Drugs used in anaesthesia: Intraveneous inducting agents, inhalational maintenance agents, neuromuscular blocking agents, analgesics.
   - Post operative care: Recovery from anaesthesia, complications during the recovery period (hypoxia, post operative nausea and vomiting, post operative pain).
   - Management of pain after major operations.

3- **Emergency surgery:** Trauma, the acute abdomen major gastro-intestinal haemorrhage.

4- **General abdominal surgery:** The acute abdomen, acute appendicitis, gallstones, Hernias.

5- **Surgery of the upper gastrointestinal tract:**
   - Diseases of the oesophagus: Hiatus hernia with or without reflux oesophagitis carcinomia of the oesophagus, achalasia, oesophageal strictures and perforation.
   - Diseases of the stomach and duodenum: Peptic ulcer disease, Careinoma of the stomach, Upper gastrointestinal bleeding.
   - Disease of the liver and spleen: Primary and secondary liver cancer, surgery of the spleen (splenectomy).
   - Diseases of the pancreas: Acute pancreatitis, pancreatic pseudocyst, pancreatic abscess, carcinoma of the pancreas.

6- **Surgery of the lower GI tract**
   - Diseases of the small bowel and appendix: Small bowel obstruction, inflammatory diseases of the small bowl, mesenteric ischaemia, acute appendicitis, tumours of the appendix.
   - Diseases of the large intestine: Colorectal cancer and polyps, bowel obstruction, diverticular disease, stomas, ulcerative colitis, Crohn's disease.

- Diseases of the rectum and anus: Ano-rectal sepsis, haemorroids and anal fissures, faecal incontinence, rectal bleeding, rectal prolapse, carcinoma of the anal canal.

Obstetrics and Gynaecology 1 5 Credits (75 - 00 - 00)

Course content:

1. **Basic Science:**

- The physiological basis of reproduction.
- Maternal physiology, the placenta and Fetal membranes, normal foetal growth.

2. **Normal pregnancy**

- Preconception counseling: purpose, beneficiaries, timing, general preconception advice, advice regarding medications and maternal age, genetic counseling, conditions where pregnancy is not recommended, specific medical diseases.

3. **Antenatal care:**

- Aims of antenatal care: antenatal education, lifestyle concerns, common symptoms in pregnancy, screening for maternal complications (Anaemia, blood groups, haemoglobinopathies, infections, hypertensive disease, gestational diabetes, psychiatric illness, placenta praevia), follow-up of pregnancy to term.

4. **Specific disorders of pregnancy:**

- Bleeding in early pregnancy: Overview, miscarriage/abortion, criminal abortion, septic abortion, incompetent cervix, recurrent abortion/miscarriage, gestational trophoblastic tumours (hydatidiform mole) ectopic pregnancy, induced abortion.
- Bleeding in late pregnancy: Antepartum haemorrhage, placenta praevia, hypertensive disorders of pregnancy (eclampsia).
- Amniotic fluid: polyhydramnios and oligohydramnios, amnioscopy and amniocentesis.
- Blood group incompatibility: Rhesus and ABO immunization.
- Foetoplacental dysfunction: foetal monitoring growth retardation.
- Foetal maturity: premature rupture of the membranes, premature labour, prolonged pregnancy.
- Multiple pregnancy.
- Errors of foetal polarity: Breech presentation, transverse and oblique lies.
- Infections in pregnancy including STIs, rubella, hepatitis B, HIV, Group B streptococcus.

5. **Normal labour**

- Anatomical and physiological basis of labour.
- The management of normal labour, analgesia and anaesthesia.
- Mechanism of normal labour, conduct of normal labour.
- The third stage of labour.

Internal Medicine 2 5 Credits (75 - 00 - 00)

Course content:

1. **Neurology:**
   - Headache syndromes and migraine.
   - Coma.
   - Convulsions and epilepsy.

- Cranial nerve palsies
- Cerebrovascular disease: Ischaemic and haemorrhagic stroke.

- Infections of the brain, meninges and spinal cord:
  Suppurative encephalitis and intra-cerebral abscess, spinal epidural abscess.
  Bacterial meningitis, tuberculosis meningitis.
  Neurosyphilis.
  Viral encephalitis.

2. Nephrology:

- Proternuria, haematuria
- Acute and chronic glomerulonephritis
- Infections of the kidney and urinary tract:
  Acute and chronic pyelonephritis
  Cystitis, urethritis, prostatitis
  Renal tuberculosis
- Renal failure: Acute and chronic
- Nephrotic syndrome
- Congenital abnormalities of the kidneys: Polycystic disease
- Tumours of the kidney
- Nephrocalcinosis
- Drugs and the kidney

3. Dermato-venerology:

- Elementary skin lesions in dermatology
- Infectious skin diseases: Scabies, fungal skin diseases, impetigo, zona/varicella
- Cutaneous manifestations of systemic lupus erythematosus
- Melanoma, angiomas, Kaposi sarcoma
- Sexually transmitted diseases: syphilis, gonorrhea and non-gonoccal infections, lymphogranuloma venereum, chancoid, granuloma inguinale

4. Infectious and parasitic diseases

- Parasitic diseases: Malaria, amoebiasis, intestinal helminthes and flagellates, giardiasis, trypanosomiasis, leishmaniosis, toxoplasmosis.
- Infectious diseases: typhoid and parathyphoid fevers, clostridial infections: tetanus, gangrene, etc, bacillary dysentery, cholera.
- HIV/AIDS
- Bacterial food poisoning
- Pyrexia of unknown origin.

Paediatrics 2 5 Credits (75 - 00 - 00)

- **Infectious and parasitic diseases:**
  - Exanthems: measles, rubella, varicella-zoster infections, scarlet fever
  - Cardiac infections: infective endocarditis, myocarditis, pericarditis, rheumatic fever.
  - Skin, joint and bone infections: impetigo, boils and cellulitis, septic arthritis, osteomyelitis.

- Dysentery, typhoid fever.
- Parasitic infections: malaria, amibiasis, toxoplasmosis, helminthiasis, scabis, Lice.
- Fungal diseases: * Tinea capitis and corporis,
  * Other dermatophytes, Candidiasis.
- Vaccinations : Types, mode of administration, side effects and calendar.

- **Gastro-intestinal diseases**
  - Neonatal jaundice
  - Acute and chronic hepatitis
  - Metabolic liver disease: α_1-antitrypsin deficiency, Wilson disease
  - Disorders of the pancreas: pancreatic insufficiency, pancreatitis
- **Immunologic, allergic and rheumatic diseases**
  - Host defense systems and immune deficiency disorders: Complement, phagocyte, B-cell deficiency, T-cell deficiency, AIDS
  - Hypersensitivity reactions
  - Allergic disorders: anaphylaxis, allergic rhinitis, allergic diseases of the eyes and ears, allergic dermatitis, urticaria and angioedema, adverse drug reactions
  - Rheumatic diseases: Rheumatic fever, juvenile rheumatoid arthritis
- **Renal diseases**
  - Proteinuria and haematuria
  - Nephrotic syndrome
  - Glomerulopathies: post-infectious glomerulo-nephritis and others
  - Tubulo-intestitial nephritis
  - Urinary tract infection
  - Renal failure: acute and chronic
  - Hereditary renal diseases: Hereditary nephritis (Alport syndrome), medullary cystic disease (nephronopthiasis), polycystic kidney disease.
  - Urologic problems in the child: Renal trauma, urolitheasis hypospadias, epispadias and extrophy of the bladder, cryptochidism, testicular torsion, urethral stenosis, neurogenic bladder.

Surgery 2 5 Credits (75 - 00 - 00)

Course content:

1- Trauma

- Fractures: Overview: clinical features, mechanism of injury, fracture patterns, malalignment, complications, and methods of treatment.
- Shoulder trauma: fractures of the clavicle, fractures of the humerus, shoulder dislocation.
- Forarm trauma: Fractures around the elbow, midshaft fractures, distal radial fractures, carpal fractures and dislocation, hand injuries (Bennett's fracture, metacarpal and phalangeal injuries, flexor tendon injury, hand infections).
- Lower limb fractures and dislocations: Hip dislocations and sprains, neck of the femur fractures, femoral shaft fracture, foot fractures.
- Axial skeleton trauma: Spinal trauma and vertebral fractures (cervical fractures, cervical

dislocatioms, thoracolumbar fractures), other types of spinal injury (osteo-porotic fractures, pathological fractures, spinal shock, whiplash injuries).

- Trauma to the pelvis: Fractured pelvis (fractured pubic rami, fractures of the pelvic ring, "Open book" fracture, floating segment fracture, lateral compression fracture, vertical shear fractures).
- Paediatric fractures: Fracture patterns, common fractures, osteogenesis imperfecta.

2- Plastic surgery

- Soft tissue trauma: Laceration, crush injury, degloving injury, haematoma, principles of management of soft tissue trauma alone or in a complex limb trauma.
- Burns: Pathology, types of burn injury, burn depth, clinical features, management (early and subsequent / late management, late complications).
- Skin tumours: Basal cell carcinoma, squamous cell carcinoma, Bowen's disease, keratoacanthoma, malignant melanoma.
- Lumps and bumps: Sebaceous cyst, lipoma, lymph nodes, furuncle (boil), dermoid cysts, basal cell papilloma, dermatofibroma, neurofibroma, haemangioma, fibroma, soft tissue sarcomas, arteriovenous fistula, bumps ans lumps around joints (Baker's cyst, rheumatoid nodules, trigger finger, bursitis).

Obstetrics and Gynaecology 2 5 Credits (75 - 00 - 00)

Course content:

1. **Disorders of labour**

- Fetal distress, umbilical cord accidents, cerebral palsy.
- Dystocia: abnormal uterine action, cephalopelvic disproportion, obstructed and prolonged labour.
- Deflexion attitudes of the foetus: Bregma, brow, face presentations.
- Errors of foetal position: occiput posterior and occiput lateral.
- Post partum haemorrhage and shock: Retained placenta, birth canal trauma, uterine atony, coagulation defect, uterine inversion shock and resuscitation, amniotic fluid embolism, cardiac arrest.

2. **Normal puerperium**

- The puerperium: Anatomy and physiology, normal care.
- Family planning: Contraception and sterilization.

3. **Disorders of the puerperium:** Infection, thromboembolism, psychoneurosis.

4. **Medical and surgical disorders of pregnancy:**

- The psyche: psychoneurosis and psychoses.
- Neurological disorders: epilepsy, cerebrovascular disease, peripheral neuropathies.
- Endocrine system: Hypothalamus, pituitary, thyroid, adrenal, pancreas, diabetes mellitus.
- Respiratory system: asthma, tuberculosis, respiratory failure.
- Cardiovascular system:

  Physiological changes of the heart in pregnancy, Heart disease in pregnancy, peripartum cardiomyopathy.

  Chronic hypertension, arterial aneurysms, varicose veins, peripheral oedema, supine hypotensive syndrome.

- The blood: Anaemia, thrombo-embolism, coagulation disorders and thrombocytopenia.
- The digestive system: Hyperemis gravidarum, diarrhea, cholestasis of pregnancy, acute fatty liver of pregnancy, viral hepatitis, chronic liver disease, acute pancreatitis.
- Urinary system: Physiological changes in pregnancy, urinary tract infection, acute pyelonephritis, haematuria, acute and chronic renal failure, acute urinary retention, stress incontinence.
- The reproductive system: Physiological changes in the genital tract in pregnancy, congenital disorders, mechanical disorders, neoplasia (uterine fibromyomas, ovarian cysts and tumours, ovarian carcinoma, vulva and vaginal intraepithelial neoplasia, cervical carcinoma, breast hypertrophy and carcinoma).
- The immune system: Immune system changes in the mother during pregnancy, immune development in the foetus, auto-immune diseases, antiphospholipid syndrome, immunization in pregnancy.

5. Operative procedures

- Induction of labour.
- Episiotomy and vaginal outlet tears.
- Forceps and vacuum extraction.
- Caesarian section.

Internal Medicine 3 5 Credits (75 - 00 - 00)

Course content:

- **Cardiovascular system:**
  - Rheumatic fever
  - Infective endocarditis
  - Ischaemic (coronary) heart disease: angina pectoris, myocardial infarction
  - Cardiomyopathy: dilated, hypertrophic and restrictive or obliterative.
  - Pericarditis: acute and chronic
  - Congenital heart disease
- **Respiratory system**
  - Pulmonary oedema.
  - Extrinsic allergic alveolitis.
  - Sarcoidosis.
  - Interstitial lung disease.
  - Pulmonary embolism and infarction.
  - Goodpasture's syndrome
  - Pulmonary arterial hypertension, chronic cor pulmonale.
  - Lung cancer.
  - Secondary tumours of the lungs.
  - Tumours of the mediastinum.
- **Endocrine system**
  - Parathyroid gland: hyperparathyroidism, hypoparathyroidism
  - Adrenal gland: Cushing's syndrome, hyperaldosteronism, Addison's disease.
  - Phaeochromocytoma, carcinoid syndrome

- Hyperlipidaemias and obesity

- **Digestive system**
  - Carcinoma of the stomach
  - Pancreatitis: acute and chronic
  - Carcinoma of the pancreas
  - Cirrhosis of the liver
  - Hepato cellular carcinoma
  - Lower gastro-intestinal haemorrhage
  - Diverticular disease, ulcerative colitis
  - Secondary malignant tumours of the liver
  - Carcinoma of the colon and rectum

Paediatrics 3 5 Credits (75 - 00 - 00)

Course content:

1. **Neonatology**

- Adaptation and resuscitation after birth: Cardiopulmonary system in transition: The foetus, the neonate, resuscitation: Apgar score, drugs used in neonatal resuscitation and their dosages.
- Care of the healthy term newborn infant: care after birth, neonatal screening, immunization, the foreskin and circumcision, bonding, family and siblings.
- Examination of the newborn and common variations.
- Feeding and nutrition of the newborn: Breast feeding, artificial feeding.
- Jaundice: Overview, normal biliribon metabolism, causes, investigations, treatment (phototherapy, exchange transfusion). Specific conditions (Haemolytic disease of the newborn, Red cell abnormalities, obstructive jaundice, breast milk jaundice, kernicterus).
- Neurological presentation: Phases of brain growth, specific neonatal conditions (Encephalopathy, seizures, spinabifida, the floppy infant, nerve palsies, intracranial haemorrhage).
- Respiratory system: Pulmonary physiology, respiratory distress and respiratory distress syndrome, pneumothorax, meconium aspiration syndrome, transient tachypnoea of the newborn.
- The small or large newborn: Preterm, small for gestational age and large for gestational age: Prematurity, the small for gestational newborn (growth restriction), the large for gestational age newborn.
- Infection: Immune system, congenital infection (cytomegalovirus, toxoplasmosis, rubella herpes simplex, syphilis), acquired infection (nosocomial infection), superficial infection (thrush, conjunctivitis omphalitis, skin infection), systemic infection, specific infections (group B beta haemolytic streptococcus pneumonia, meningitis, osteomyelitis, HIV/ AIDS).
- Congenital malformations: Overview, congenital heart disease (coarctation of the aorta, ventricular septal defect, transposition of the great arteries, hypoplastic left heart), Neural tube defects, cerebral palsy, bowel atresia, meconium Ueus, Hirschsprung

disease, imperforate anus, trachea-oesophageal fistula, exomphalos (omphalocele) and gastrochisis, diaphragmatic hernia, congenital dislocation of the hip, undescended testes, hypospadias and chordee, ambiguous genitalia, cleft lip and cleft palate, Down syndrome, Trisomy 18 (Edward sydrome), Turnen syndrome, skeletal dysplasia and dwarfism.

- Haematology: Overview of haematological features of newborn, anaemia, polycythaemia, haemorrhagic disease of the newborn, disseminated intravascular coagulation, platelet abnormalities, blood in stool.
- Prenatal transport and neonatal retrieval
- Still birth, neonatal death and grieving

2. Haematologic diseases

- Anaemia: Hypochromic microcytic, macrocytic, normochromic normocytic;
- Disorders of the haematopoietic stem cell: pancytopenia, bone marrow aplasia, acquired aplastic anaemia;
- Polycythemia (erythrocytosis);
- Leukocyte disorders: neutropenia,;
- Disorders of haemostasis: haemorrhagic diathesis, disorders of blood vessels, disorders of platelets, disorders of soluble haemostatic factors (Haemophilia A and Von Willebrand disease), Haemophilia B, vitamin K deficiency, disseminated intravascular coagulation.

3. Endocrine and metabolic disorders

- Disorders of carbohydrate metabolism: diabetes mellitus and complications, hypoglycemia
- Hyperlipemic disorders
- Disorders of the thyroid gland: Hypothyroidism, hyperthyroidism, thyroiditis, thyroid nodules;
- Disorders of the piptuitary gland:

  Disorders of the anterior lobe: Growth hormone disorders, TSH deficiency, ACTH deficiency, gonadotropin defiency;

  Disorders of the posterior lobe: ADH disorders, oxytocin disorders

4. Neurologic diseases

- Altered states of consciousness: delirium and coma
- Malformations of the CNS: Disorders of embryogenesis, disorders of cellular migration and proliferation, hydrocephalus, congenital defects of cranial nerves and related structures, cerebellar malformations;
- Cerebral palsy;
- Convulsions (seizures) and epilepsy;
- Non epileptiform paroxysmal disorders, migraine, sleep disorders (sleepwalking, sleep talking, night terrors and narcolepsy) and others (syncope, breath-holding spells).

Surgery 3 5 Credits (75 - 00 - 00)

Course content:

1- Neuro-surgery

- Head injury: Overview, intracranial haemorrhage (traumatic intracranial haematomas, spontaneous intracranial haemorrhage, intra cerebral haemorrhage).

- Spinal cord compression, spina bifida.
- Brain tumours, hydrocephalus.

2- Vascular surgery:

- Varicose veins, peripheral vascular disease aneurysms (abdominal aortic aneurysm and others: popliteal, thoracic aortic, femoral).
- Carotid artery disease, Raynaud's phenomenon and disease, thoracic outlet syndrome, Buerger's disease.
- The acute limb: Acute ischaemic limb, deep vein thrombosis, cellulitis.
- Ulcers and diabetic foot: Ulcers (venous, arterial [ischaemic], neuropathic), the diabetic foot, Charcot's joint.

3- Urology:

- Benign prostatic hyperplasia, acute urinary retention, prostate cancer.
- Testicular and penile tumours: testicular cancer, penile cancer, eponymous urological conditions (Peyronie's disease, balanitis, Fournier's gangrene, hydatid of Morgagni, paraphimosis, phimosis).
- Testicular lumps: Hydrocele, varicocele epididymal cysts and spermatoceles, testicular torsion, epididymitis and orchitis.
- Haematuria and urological tumours: Haematuria, bladder tumours, renal cancer.
- Urinary stone disease (urolithiasis).
- Urinary tract infection and urinary incontinence (stress incontinence, urge incontinence, overflow incontinence, the neuropathic bladder).

4- Cardiothoracic surgery

- Cardiac surgery
- Thoracic surgery
- Tracheostomy

5- Transplantation

- Indications for common transplantations
- Complications for transplantation.

Obstetrics and Gynaecology 3 5 Credits (75 - 00 - 00)

Course content:

1. Basics

- Clinical anatomy of the pelvis and reproductive tract.
- Normal and abnormal development of the genital tract.
- The role of ultrasound in gynaecology: Ultrasound techniques, transvaginal ultrasound, transabdominal ultrasound, saline infusion sonography, the role of ultrasound in a non-pregnant patient, role of ultrasound in early pregnancy.
- Hysteroscopy and laparoscopy.

2. Childhood and adolescence

- Puberty and its disorders: Control of the onset of puberty, physical changes of puberty, precocious puberty and differential diagnosis of early onset of puberty, delayed puberty, aetiology of primary amenorrhoea, normal secondary sexual characteristics, absent

secondary sexual characteristics (normal height), absent secondary sexual characteristics (short stature), heterosexual development (congenital adrenal hyperplasia, androgen secreting tumours, 5-alpha reductase deficiency, true hermaphrodite, absent mullerian inhibitor).

- Gynaecological disorders of childhood and adolescence:

  Prepubertal child: vulvovaginitis, foreign body, vaginal bleeding, labial adhesions.

  Adolescence: Menstrual problems (heavy menstruation, primary dysmenorrhoea, premenstrual syndrome), hirsutism.

3. Menstruation

- The menstrual cycle.
- Contraception and sterilization.
- Polycystic ovary syndrome and secondary amenorrhoea.
- Menstrual problems: heavy menstrual bleeding and primary dysmenorrhoea.
- Premenstrual syndrome.
- Menopause and the postmenopausal woman.

4. Inability to conceive

- Infertility: Initial assessment with appropriate initial investigations, male factor infertility, disorders of ovulation, tubal factor infertility, endometriosis, fibrosis and uterine factors, unexplained infertility.
- Assisted reproduction: Investigations prior to assisted conception, types of assisted conception (intrauterine insemination, in vitro fertilization, complication of assisted conception).

5. Pelvic pain

- Pelvic infection: Epidemiology and risk factors, microbiology, clinical presentation, investigations, management, prevention.
- Chronic pelvic pain: Epidemiology, clinical assessment, causes, investigations, management.

Internal Medicine 4 5 Credits (75 - 00 - 00)

Course content:

1. Neurology:

- Diseases of the spinal cord and peripheral nerves

  Compression of the spinal cord or nerve roots, paraplegia, lumbago-sciatica syndrome

  Peripheral neuropathy: mononeuropathy, mononeuritis multiplex, generalized polyneuropathy, Guillain Barré Syndrome.

- Demyelinating diseases: multiple sclerosis, acute demyelinating encephalomyelitis
- Diseases of the extrapyramidal system: Parkinson's disease, etc.
- Degenerative and congenital diseases: motor neurone disease, hereditary ataxias, syringomyelia, neurofibromatosis
- Myasthenia gravis

2. Rheumatology

- Infective and miscellaneous arthritis

- Rheumatoid arthritis
- Systematic lupus erythematosus
- Sclerodermia
- Dermatomyositis
- Osteo-arthrosis
- Gout
- Paget's disease
- Tuberculosis of the joints and vertebral column

3. Psychiatry

- Generalities on mental health: personality development, mechanisms of defence, psychological normality, mental handicap, psychiatric examination
- Psychosis: * Organic: delirium, dementia
  * functional: Depression, Schizophrenia
- Psychoneurosis: anxiety neurosis, hysterical psychoneurosis, obsessional psychoneurosis, depressive psychoneurosis, phobic psychoneurosis.
- Personality disorders : Obsessional, schizoid, hysterical sociopathy
- Alcoholism and drug dependence

4. Haematology

- Anaemias:
  Anaemias due to blood loss
  Anaemias due to inadequate production of red cells
  Anaemias due to excessive red cell destruction
- Transfusion with incompatible blood
- Erythrocytosis, polycythemia vera, other myeloproliferative disorders
- Neutropenia and agranulacytosis
- Acute leukaemias
- Chronic leukaemias: myeloid, lymphatic
- Lymphomas: Hodgkin's and non-Hodgkin's, Burkitt's
- Multiple Myeloma
- Haemorrhagic diseases: haemophilias, Von Willibrand's disease
- Thrombosis, disseminated intravascular coagulation.

Paediatrics 4 5 Credits (75 - 00 - 00)

Course content:

1. Oncologic diseases:

- General principles of oncologic diseases in children
- The leukaemias: Acute leukaemias, chronic leukaemias
- Hodgkin and non-Hodgkin lymphomas
- Neuroblastoma
- Wilms tumour
- Soft tissue sarcomas

- Bone tumours: Ewing and osteogenic sarcomas
- Brain tumours: Astrocytomas, medulloblastoma
- Hepatoblastoma, hepatocellular carcinoma
- Germ cell tumours
- Histiocytosis X

2. <u>Endocrine and metabolic disorders</u>

- Disorders of the adrenal gland: congenital adrenal hyperplasia, primary adrenal insufficiency, Cushing syndrome, pheochromocytoma, multiple endocrine adenomatosis syndrome
- Disorders of the gonads:
  - Disorders of sexual differentiation of the new born
  - Disorders of puberty
- Disorders of calcium metabolism
  - Primary and secondary parathyroidism
  - Hypo parathyroidism
  - Neonatal hypocalcemia
- Rickets
- Assessment of growth of a paediatric patient

3. <u>Neurologic diseases</u>

- Cerebrovascular disorders: Vascular occlusion, haemorrhage, arteriovenous malformations
- Neurofibromatosis
- Diseases of the motor unit (neuromuscular disorders):
  - Spinal muscular atrophies
  - Peripheral neuropathies (hereditary, sensory and motor neuropathy, Guillain-Barré syndrome)
  - Myasthenia gravis
  - Muscular dystrophies

4. <u>Paediatric emergencies</u>

- Resuscitation: Overview, cardiopulmonary
- Shock
- The febrile child
- Coma
- Status epileptus
- Anaphylaxis
- The death of a child

5. <u>Child health supervision</u>

- The prenatal visit
- Newborn nursery health supervision
- Health supervision visits
  - Early infancy health supervision

Late infancy health supervision

Preschool years health supervision

School-age health supervision

Adolescent health supervision

Surgery 4 5 Credits (75 - 00 - 00)

Course content:

1- Breast surgery

- Breast carcinoma
- Benign breast disease and breast examination: Benign breast conditions (Fibroadenoma, fibrocystic change, breast cycts, breast pain (mastalgia), nipple discharge, breast infection, fat necrosis, gynaecomastia).

2- Neck and endocrine surgery:

- Thyroid disorders: Thyroid cancer, thyroid enlargement (diffuse goiter, multinodular goiter, single lump).
- Lymph nodes and endocrine disorders: lymph nodes, parathyroid glands, adrenal disorders (neuroblastoma, Phaechromorytoma, multiple endocrine neoplasia, Corri's sydrome), pituitary tumours.
- Neck lumps: Midline lumps: Thyroid goiter, thyroglossal duct cyst and sinus, dermoid cyst, pharyngeal pouch; Non midline lumps: salivary gland lumps (parotid, submandibular and sublingual glands), bronchial cysts, sinuses and fistulas, other causes (lymphatic malformation [cystic hygroma], carotid body tumour, sternocleidomastoid tumour, cervical rib).

3- Orthopaedics

- Back pain, shoulder pain.
- Elbow, wrist and hand disorders.
- Upper limb nerve palsies (carpal tunnel syndrome, ulnar nerve palsy, radial nerve palsy).
- Ostheoarthritis.
- Knee pain in adults and in children.
- Ankle and foot disorders: Hallux valgus, hallux rigidus, pes cavus, Achilles tendon rupture, flat foot, plantar fasciitis, congenital talipes equinovarus (club foot).
- Metabolic bone disorders: Osteoporosis, Osteomalacia, Paget's disease, avascular necrosis.
- Bone and infections: Septic arthritis, osteomyelitis, tuberculosis of bone.
- Bone tumours: Malignant primary tumours (osteosarcoma and others e.g chondrosarcoma, Ewing's tumour, multiple myeloma, giant cell tumours).
- Metastatic bone disease.

Obstetrics and Gynaecology 4 5 Credits (75 - 00 - 00)

Course content:

1. **Endometriosis:** Classification, aetiology and risk factors, clinical presentation, investigations, treatment.

2. **Urogynaecology**

- Uterovaginal prolapse: Structure and function of the pelvic floor, pathophysiology of pelvic floor dysfunction, definition and clinical presentation of uterovaginal prolapse, investigations, treatment.
- Urinary incontinence: Strucure of the lower urinay tract, functioning of the lower urinary tract, pathophysiology of urinary incontinence, clinical presentation of urinary incontinence, investigations, causes of urinary incontinence, treatment.
- Other lower urinary tract disorders: Urethral lesions (urethral caruncle, urethral mucosal collapse, urethral stenosis or stricture, carcinoma of the urethra), urinary frequency and urgency, urethral pain syndrome, painful bladder syndrome, sexual problems.

3. **Benign gynaecological disease**

- Benign diseases of the vulva: Inflammatory disease of the vulva (lichen sclerosus, vulval lichen planus, eczema, psoriasis, bullous diseases), vulval ulceration, etc.
- Benign diseases of the vagina, cervix and ovary: Vaginal infection (bacterial, vaginosis trichomoniasis, candidasis, syphilis, gonococcal vaginitis, viral infections), vaginal atropy, vaginal trauma, fistula, endometrosis, cervical metaplasia, endocervical polyps, chronic cervicitis, polycystic enlargement of ovaries, ovarian endometriosis, benign ovarian tumours.
- Benign disease of the uterus: Adenomyosis, endometrial polyps, uterine leiomyomas, fibroids.

4. **Gynaecological oncology**

- Malignant disease of the vulva and vagina: Vulvar cancer, vaginal cancer.
- Premalignant and malignant disease of the cervix: Cervical intraepithelial neoplasia, cervical cancer.
- Epithelial ovarian cancer.
- Endometrial cancer.

5. **Miscellaneous topics:**

- Sexual dysfunction: female sexuality, female sexual dysfunction, categorization and definitions of main sexual disorders in women, Male sexual dysfunction.
- Domestic violence and sexual assault.

Introduction:

On successful completion of the first three years of medical studies dealing predominantly with biomedical sciences, the student is admitted into the clinical science years. This part of medical studies lasts two calendar years (four semesters) during which in addition to theoretical courses given in amphitheatres, students make clinical rotations through the different medical departments.

The first clinical year rotations involve students as members of clinical service teams in the disciplines of Internal Medicine, Surgery, Paediatrics, Obstetrics and Gynaecology as well as Public Health. The second clinical year rotation (Year 5) involves additional experience in the same disciplines encountered in the first clinical rotation year (Year 3).

These internships or clerkmanships will be carried out primarily in clinical units at local and regional health centres and hospitals. During these clerkships, students continue to develop and improve the clinical skills to which they were exposed during their early experience and to improve their abilities in the clinical reasoning process. This exposure is also intended to achieve integration of the clinical features of diseases with an understanding of the underlying disorders of normal structure and function and the use and interpretation of laboratory, radiological and other paraclinical investigations in rejecting or confirming clinical diagnosis. In the clerkships, the

students are exposed further to factors which inform a rational, cost effective and human use of the vast array of therapeutic measures and substances which are available for the amelioration and cure of disease conditions.

Clinical clerks will display in their attitudes, dress, behavior in public and inter-relationship with the patients and all categories of staff in the units where they are assigned, the highest standards of deportment and medical ethics. Such an approach will ensure that the students will deserve the maximum benefit from this period of medical tutelage. The clinical semiology course offered and the early clinical experience offered and acquired in the third year of medical studies are prerequisitis for a smooth transition to clinical clerkship activity.

Junior Rotations in Internal Medicine 4 Credits (0 - 00 - 60)

Course content:

At the end of the rotation, the student will be expected to be proficient in the following areas:

- History taking: the clinical history;
- The techniques of physical examination including: normal and abnormal physical signs, the intelligent interpretation of the physical signs;
- The relationship of abnormal findings disturbing physiological/Biochemical or anatomical parameters;
- The pathology of disease and the relationship of symptoms and physical signs to pathological processes;
- The various presentations and complications of a disease;
- The natural history and course of the disease process.

Junior Rotations in Surgery 4 Credits (00 - 00 - 60)

Course content:

At the end of the clinical rotation, the student must be able to:

- Take a history of a surgical patient
- Perform a physical examination including normal and abnormal physical signs and interpret intelligently the physical signs.
- Learn the different types of sutures, wound dressing and follow-up
- Observe and assist in the following operations: Herniorrhaphy, appendicectomies, immobilization of fractures and plastering, circumcisions,
- Follow– up of surgical patients in the wards.

Junior Rotations in Paediatrics 4 Credits (00 - 00 - 60)

Course content:

At the end of the clerkship, the student must be able to:

- Take a complete history from the parent or guardian with special emphasis on those aspects of more relevance to the paediatric age group e.g antenatal, and post natal histories, nutritional and dietary history, developmental, immunization and societal and family history;
- Perform a physical examination on a child and gestational assessment of the newborn;
- Estimate the age of any child based on physical, developmental and behavioural features;

- Identify, based on the history and examination, all the problems in the physical, social, behavioural and intellectual functioning of the child;
- Assess the nutritional status of the paediatric patient and understand the use of growth charts;
- Be able to perform the following technical skills;
- Perform venipuncture: antecubital, external jugular and femoral veins;
- Perform Heel prick;
- Start an intravenous infusion using scalp or peripheral vein;
    - Obtain throat and blood specimens for cultures;
    - Insert a naso gastric tube;
    - Feed a baby by bottle;
    - Perform bag and mask ventilation and external cardiac massage;
    - Perform and interpret urinalysis and microscopy, dextrostix, haematocrit and bilirubin estimation, blood gas analysis and transillumination of skull and chest;
    - Witness and describe the following procedures:

        Saphenous vein cutdown

        Umbilical vein catheterization

        Exchange transfusion

        Resuscitation of the newborn

        Suprapubic aspiration

        Lumbar puncture

        Thoracentesis

        Subdural tap

        Denver development screening test

Junior Rotations in Obstetrics and Gynaecology 4 Credits (00 - 00 - 60)

Course content:

At the end of the clinical rotation the student must be able to:

- Perform vaginal speculum examination
- Monitor women in labour
- Perform vaginal (normal) deliveries
- Observe/assist manual removal of placenta
- Suture episiotomies and first degree perineal tear
- Observe breach deliveries
- Take obstetrical histories of pregnant women
- Perform antenatal consultations

Senior Rotation in Internal Medicine 4 Credits (00 - 00 - 60)

Course content:

This is basically a continuation of the rotation started in the fourth year of medical studies (See CLSH4107). The student is now exposed to more clinical responsibilities. In

addition to the objectives of the fourth year and under the tutelage of an instructor, the student must be able to

- Make diagnoses
- Order appropriate investigations to confirm or refute the diagnosis
- Monitor patients under his care and make rational interpretations of the different investigations done
- Propose logical therapeutic interventions based on a sound pharmacological basis for the management of disease
- Evaluate the prognosis of a disease process and its impact on the individual and his/her relatives physically, emotionally and financially.
- Measure the ethical and legal issues related to various disease conditions.

Senior Rotation in Paediatrics 4 Credits (00 - 00 - 60)

Course content:

This is a continuation of the junior rotation in the fourth year of studies. In addition to all the objectives of the fourth year, the student should be able to perform the following under supervision

- Saphenous vein cutdown
- Umbilical vein catheterization
- Exchange transfusion
- Resuscitation of the newborn
- Suprapubic aspiration
- Lumbar puncture
- Thoracentesis
- Subdural tap
- Deaver development screening test

The student should also be able to do the following:

- Give advice to parents on infant and child feeding and nutrition having regard to their social and economic circumstances.
- Design a childhood immunization programme.

Senior Rotation in Surgery 4 Credits (00 - 00 - 60)

Course content:

This is a continuation of the junior rotation in the fourth year of studies. In addition to all the objectives of the fourth year, the student should be able to:

- Participate in surgical consultations with his/her chief;
- Examine, diagnose and excise lumps under local anaesthesia;
- Do uncomplicated hernias
- Tap hydrocele; circumcise
- Suture abdominal wounds after laparatomy
- Suture accident wounds whenever and whenever possible:
- Carry out bowel resections assisted by the principal operator
- Trephening of subdural haematoma

- Reduction and external immobilization with POP of simple fractures
- Incise and drain small and intermediate abscesses.
- Carry out aspiration or incisional biopsies.

Senior Rotation in Obstetrics and Gynaecology 4 Credits (00-00-60)

Course content:

This is a continuation of the junior rotation in the fourth year of studies. In addition to all the objectives of the fourth year, the student should be able to:

- Repair episiotomies or second degree perineal tears,
- Perform manual removal of placenta;
- Assist at bimanual compression of uterus or compression of abdominal aorta to control post partum haemorrhage
- Perform culdocentesis and colpotomy
- Perform paracentesis abdominis
- Repair vaginal or cervical tears
- Perform, two breech deliveries under supervision
- Perform dilatation and curettage.

The student should also observe and assist in :

- Manual vacuum aspiration
- Paracervical anesthetic block
- Pudendal block
- Low forceps delivery
- Vacuum extraction
- Caesarian section
- Salpingectomy for ectopic pregnancy
- Repair of uterine rupture or post partum hysterectomy.

Housemanship 6 Credits each (00-00-90)

Year six is divided into two periods which are utilized as follows:

- Two months each of clinical rotation in the department of internal medicine, paediatrics, surgery and obstetrics and gynaecology. During these rotations, the student will work mostly in the emergency units of these departments and serve as a house officer. He will have clinical responsabilities and will also supervise the work of Years'5 and 4 students.
- Four months of work in a District Hospital and the District Medical Service where the student will work as a shadow District Medical Officer and as an assistant to District Hospital Director. This will permit him/her to learn the managerial aspects of a district hospital as well as use knowledge, aptitudes, skills, and his/her clinical reasoning to solve the common health problems found at a district hospital in internal medicine, paediatrics, surgery and obstetrics and Gynaecology. He/She will also learn how to manage and administer a District medical service.

DEPARTMENT OF PUBLIC HEALTH

Introduction to Basic Statistics 2 Credits (20 - 10 - 00)

Objectives: To acquaint students with some basic statistical methods and procedures that are commonly used in medicine to reach certain conclusions that can be applied to patient care and public health planning.

Course Content:

- Frequency distribution, mean and standard deviation, range
  - Populations and samples
  - Statements of probability
  - Differences between means
  - Percentages and paired alternatives
  - The t-tests
  - The χ^2 tests
  - Exact probability test
  - Rank sum tests
  - Correlation and correlation coefficient
  - Rank correlation
  - Unwieldy numbers

Social Sciences: Anthropology, Sociology, Psychology 3 Credits (45 - 00 - 00)

Course Description: "Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO, 1948). This broad definition of health is applicable to all cultures and age groups. While a disease will most likely compromise the three fundamental "humors" – physical, mental, social/spiritual – of life, the absence of an obvious illness does not preclude an imbalance in them. In fact, the Health of society and family implies institutional, social and spiritual well-being as well as acceptable character that vary across cultures, hence the concept of social and behavioural medicine. Counseling of a worried person, for example, should include efforts to promote his or her social, cultural, emotional and spiritual well-being, as a discord or conflict in social or family relationships or cultural transgression may be more challenging than the treatment of biomedical illness.

This course is designed to introduce the student to the social, cultural, psychological or emotional and spiritual dimensions of being healthy, suffering from an illness, playing the sick role, behaviours or practices that prevent becoming ill, seeking treatment, and much more. These will be examined as they implicate human anatomy and physiology. As such, the course will introduce the student to the social and behavioural sciences, drawn mainly from three disciplines: Anthropology, sociology and Psychology. Relevant theories and principles will be discussed in relation to developmental tasks and the role the individual and society is expected to play in health, illness or remedy processes. Students in the health service professions in general and Medical practitioners in particular should be able to apply theories and principles of these disciplines to their future professional practice and research.

Course Objectives: By the end of this course, the student should master the theories, principles and background factors generating from social and behavioural sciences that are consistent with the WHO definition of health and hence applicable to medical practice for preventive, curative and restorative services.

Course Content:

1. Introduction to General Psychology
   a. Definition of key concepts
   b. Trends in Schools of Thought in psychology and their medical implications
   c. Personality: individuation and individual differences
   d. Human needs in health and illness: Maslow's hierarchy of needs
2. Introduction to Physiological Psychology
   a. Key concepts and overview
   b. Biological bases of behavior: The human sensory and human biochemistry
   c. Brain and behavior: The intimate bond
3. Health services in lifespan development perspective
   a. Overview of lifespan human development
   b. Domains of development and health: physical, cognitive/mental, social, emotional, moral and spiritual
   c. Development theories in lifespan perspective
   d. Developmental disabilities
   e. Inclusion issues in human development and health care delivery services
4. Introduction to Medical sociology / Anthropology
   a. Overview of medical sociology/anthropology
   b. Interpersonal perception, social influence, social attitudes
   c. Social organizations, groups
   d. Health and illness as cultural phenomena : Ethnomedicine and Biomedicine
   e. Health Behaviour
   f. Illness behavior
   g. Sick role behaviour
   h. Rights/Duies/Privileges of a patient
   i. The health Belief Model
5. Clinical counseling and Psychotherapy
   a. Overview of clinical psychology
   b. Human adjustment
   c. Maladjustment and psychological disorders
   d. Introduction to psychosomatic medicine
   e. Behavioural medicine and holistic patient care
   f. Introduction to Clinical Counseling and Psychotherapy

Environmental Sanitation And Health Promotion 2 Credits (30 - 00 - 00)

Objectives: To give the student notions on environmental sanitation and the consequences and its role in a prevention of disease in a community; to permit also the student to acquire basic knowledge in the domain of health education

Course Content:

- Definition of environment, environmental sanitation, Economic concept of health.
- Water supply and purification

- Evacuation of dry refuse
- Evacuation of faeces and liquid refuse
- Housing, planning, siting, physiologic needs
- Public health implications of use of pesticides, insecticides, farm fertilizers
- Natural and manmade catastrophes and public health consequences
- Burial of the dead and cemeteries
- Pollution (land, water, air)
- Food hygiene, hygiene at work place
- Role of various development sectors in environmental health.
- Health education: definition of concepts of IEC
- Health education: fundamental principles of health education
- Health education: identification of priority health problems
- Determination of target populations for IEC
- Techniques and methods in health education
- Role of mass media in health education.
- Planning an IEC project.

Ethics and Civic Education 1 Credit (15 - 00 - 00)

Objectives: The focus of this course is the fundamental issues of State as they relate to Nationhood, governance and the ethical upbringing of students. It therefore tries to instill in the students, knowledge of their nation and how it relates to other societies.

Course Content:

- **Civics and Citizenship :** Definition of Civics and Citizenship, Research for studying Civics and Ethics, Acquisition of citizenship in Cameroon (see constitutional instrument), a survey of the History of Cameroon, Evolution of the Cameroon's Constitution (emphasis on major amendements), National symbols: Flag, Seal, Coat of Arms, Anthem; Rights, Responsibilities and Obligations of citizens (Based on the Universal declaration of Rights and the Constitution of the Republic of Cameroon);
- **Civil status and Naturalization in Cameroon:** Civil status Ordinance, Birth Certificate, Marriage certificate, Relations between Civil Service Registry and the Judiciary, Naturalization;
- **National Unity and National Integration:** Definition of concepts: National Unity and national Integration in Cameroon; The process of Nation Building: Governments efforts, Community efforts, Individual efforts; Challenges and Prospects of Nation Building;
- **State System and Arms of government in Cameroon:** Definition of terms: State and Government, Origin an Evolution of the State and Government System, Arms of Government: Executive, Legislative, Judiciary; Structure of Government, Sources of government revenue;
- **Local government:** Local Government in a federation, Local Government in the Unitary State, the Councils, Types of Councils (traditional councils, Rural councils, Urban counils), Management of the council, Resources of the council, Duties of Council and parliamentarian Representatives, Classification of Chiefdoms: First class, second class, third class;
- **Electoral and Party Systems:** Universal suffrage, System of Elections: Direct elections, Indirect elections; Types of voting: Plebiscite/Referendum, Representative Elections;

Party systems: One party System, Multi-party System; Evolution of Electoral institutions in Cameroon: MINAT, National Electoral Observatory, Elections Cameroon;

- **The process and state of decentralization in Cameroon:** Constitutional basis of decentralization, the process of decentralization, Challenges of the decentralization;
- **Cameroon in multilateral relations:** UNO (emphasis on major organs), From OAU to AU, From UDEAC to CEMAC, ECCAS, The Commonwealth of Nations, The organization of the Francophonie, The Islamic Conference, The European Union;
- **Ethical Education:** Definition of Ethics, Reasons for studying Ethics, Types of Ethics, Ethical concepts, Prudence and Morality, Egoism and Altruism, Social and Corporate moral Responsibility;
- **Inertia:** Corruption, Embezzelment, Tribalism, Discrimination, Fraud.

English for Medical Profession 1 Credit (15 - 00 - 00)

Objectives: Give the student a solid foundation permitting him/her to exploit with ease documents that are indispensable for His/her training that are written in English.

Course Content:

- Oral comprehension, written comprehension
- This course will be taught using necessary didactic material, such as video and magnetoscopes.

Francais Appliqué aux Sciences de la Santé 1 Credit (15 - 0 - 0)

Objectives : Donner à l'étudiant les bases lui permettant d'exploiter aisément les documents indispensables à sa formation et qui peuvent être écrits en Français.

Course Content :

La compréhension orale, la compréhension écrite.

Cet enseignement s'opère en utilisant du matériel didactique nécessaire (vidéo, magnétoscope).

ICT 1 1 Credit (15- 00 - 00)

Objectives: The course is designed to give the student the theoretical and practical notions permitting him to use the new technologies of information and communication.

Course Content:

Overview of Computer Science:

- Definition of ICT and computer science;
- Definition of computer;
- Computer science and a career (technology on the world stage);
- Functioning of computer;
- Types of computers;
- Anatomy (parts) of computer;
- Computing environment.

Operating Systems and software

- The operating System: Utility programs and file management (directories, library and files);

- Application software and software used in the medical field;

Microsoft Office:

- Presentation software.

ICT 2 2 Credits (15- 00 - 15)

Objectives: Same as above

Course Content:

Networking:

- Connecting computer devices,
- Using the Internet and web resources (web browsers, search engines, electronic mail, instant messaging, Social Networks);

Protection of digital data and devices (Security);

Microsoft Office:

- Word Processing;
- Using Microsoft Excel;

Nutrition 2 Credits (30 - 00 - 00)

Objectives: Upon completion of this course the students will be able to:

- Understand the importance of nutrition and its role in maintaining good health;
- Gain knowledge of the various nutrients, their functions, sources and deficiencies;
- Recognize the recommended amounts needed;
- Identify the various nutrition al status assessment techniques

Course content:

- Introduction: Importance of nutrition to the human body, International nutrition agencies, foods habits, nutrition problems and policy in Cameroon.
- Carbohydrates: Sugar, Starch and Fibre: Role carbohydrates in health, simple and complex carbohydrate, digestion and absorption, benefits of fibre in the diet, recommended amounts of carbohydrates
- Fats and Lipids: Definition, functions and sources, types of fats: triglycerides and cholesterol, digestion of Fats and Recommended dietary levels, Health Problems from fat.
- Proteins: Classification, sources and functions of proteins in the body, Amino Acid, protein complementation, recommended protein intake, malnutrition in Cameroon, side effects of high protein intake.
- Vitamins: Fat soluble (Functions, sources, deficiencies symptoms, toxicity and other characteristics of fat soluble vitamins).
- Vitamins: Water soluble (Functions, sources, deficiencies symptoms, toxicity and other characteristics of fat soluble vitamins).
- Minerals: Functions, sources, deficiencies and toxicity of minerals, sodium, chloride, potassium, calcium, phosphorus, magnesium, iron, zinc, iodine, selenium, copper and water.
- Classification: the four food groups, food pyramid, balanced diet.
- Lifecycle Nutrition: Pregnancy, lactation, infants, toddlers, adolescents, teenagers, adults and elderly

- Assessment of nutritional status: Anthropometry measurements, biomedical analysis, 24H food recall, food frequency questionnaires and physical examinations.
- Introduction to therapeutic diets: definition, regular diet, liquid diet, soft diet, calorie controlled diet, low cholesterol diet, sodium restricted diet, protein die and bland diet.

Nursing and first aid 1 2 Credits (20 - 10- 00)

Objectives: To teach the student the fundamentals of nursing management of a patient from admission to discharge.

Course Content:

- Admission procedures of a patient to hospital: History, medical records, importance of bed-positioning of a patient.
- Notion of asepsis and antisepsis
- Taking and recording vital signs (Blood pressure, Pulse, Temperature, Weight)
- Administration of drugs per OS and parentally (IM, IV and Subcutaneously)
- Keeping of nursing records
- First aid methods and techniques

Nursing and first aid 2 3 Credits (00 - 00- 45)

Objectives: Permit the student to acquire the necessary practical atitudes of the nursing profession towards patients from admission to discharge.

Content:

- The following technical attitudes will be taught both theorically and practical
  - Reception of a patient in hospital
  - Psychological assessment of a patient and reporting of patient's complaints to the medical officer, installation of patient;
  - Use of a tourniquet and direct intravenous injection of drugs;
  - Administration of drugs by intra-muscular injections;
  - Setting up of a perfusion drip and regulation of rate of flow;
  - Administration of drugs by an electric seringe;
  - Distribution of drugs to patients according to medical prescriptions;
  - Surveillance and maintenance of cleanliness;
  - Feeding of a bed ridden patient;
  - Mobilization of a bed ridden patient;
  - Monitoring of a patient: pulse, Blood pressure, ECG, state of consciousness;
- Alerting the medical officer in case of a problem
- Nursing call, transmission notes of care or change of team
- Wound cleaning and dressing according to medical prescription
- Follow-up of medical visit and keeping of medical records
- Rules of asepsis in hospital especially in the theatre and intensive care unit
- Preparation of patient's discharge: Counseling, his/her prescriptions, his/her medical appointments.

NB: See with Nurses

Research Methodology 2 Credits (20 - 10 - 00)

Objectives: This course is designed to capacitate the student develop a research protocol for his end of course research dissertation.

Course Content:

- Overview of a research protocol
- Research or study question or objectives
- Literature review: rationale, previous studies on the subject.
- Design and methods:
  - Study population: Selection of subjects to be studied and definitions
  - Data collection methods: measurements, definitions
  - Data management andstatistical issues including sample size and statistical analysis
- Ethical issues or considerations
- References
- Budget.

Medical Ethics and Deontology 1 Credit (15 - 00 - 00)

Objectives: This course is designed to familiarize students with the elements of medical ethics and deontology which will guide them in their future professional practice.

Course Content:

MEDICAL ETHICS

1. Introduction and overview
2. Moral reasoning in Medicine
3. Principles, duties and virtues: Prima facie duties, Beneficience and respect for autonomy, Moral virtues and moral characters, Challenging traditional pre-suppositions
4. Models of moral responsibility in medicine
5. The management of medical information
6. Medical paternalism
7. Reduced autonomy and diminished competence
8. Third party interest (with fiduciary obligations: parents and guardians and with nonfiduciary obligations)

MEDICAL DEONTOLOGY

- The obligations of a physician: prior obligations of the professional, fundamental obligations of a practicing ohysician (to hn/herself, to colleagues, in the domain of social, towards the administration and the patient)
- The rights of the patient
- Medical responsibility: disciplinary, criminal (penal), civil.
- Medical secret: definition, cntent, divulgation

Demography 1 Credit (15-00-00)

Objectives: This course introduces the basic concepts and methods of general demography with special emphasis on medical demography analysis. Students will become familiar with the sources of demographic data available, the size, geographic distribution, and composition

of human populations, modes of change and measures of marriage/divorce, fertility, births, mortality, migration, and other relevant population transitions. Life table, standardization and population projection techniques will also be explored. The importance of demographic concepts, models, and techniques to the analysis of the dynamics of morbidity, disability, and mortality. The consequences of health, sickness, accidents, disability, and death for the size, composition, and structure of the population; and with the economic, social, and policy impacts of those dynamics.

Couse Content:

Overview of Demography and Medical Demography: Introduction to Demography; Definition of Demography ;Definition of Medical Demography ; Static Aspects of Demography (age, sex, marital status, race, economic characteristics, etc.); Dynamic Aspects of Demography (fertility, nuptiality, mortality, migration, growth, etc.); The Relevance of Demography for Medicine

Sources of Demographic Data: Civil Registration (definition, history, purpose, characteristics, definitions and contents); Censuses (definition, history and essential characteristics); Surveys (definition, purpose and essential characteristics).

Ratio, Rate and Probability: Definition of Ratio; Definition of Rate : Crude Rate, Crude Birth Rate, Crude Death Rate, Rate of Natural Increase, Specific Rate, Age-Specific Rate, Probability in Demography, Probability of Dying, Probability of Surviving.

Introduction to Population Composition: Sex and Age: Sex and Sex Ratio (Sex Ratio of Births, Sex Ratio of Deaths, Sex Ratio of Migrants); Age(Demographers' Definition of Age, Data Collection on Age, Age-Reporting Errors, Age Ratio, Mean Age, Median Age, Age-Dependency Ratios, Child-Dependency Ratio, Age Pyramid); Lexis Diagrams (Definition of Lexis Diagrams, Construction of Lexis Diagrams).

Fertility and its Measurement : Definition of Fecundability, Fertility(natality), Infertility, Reproductivity, Gravidity, Parity, Birth Interval and Pregnancy Interval (based on vital statistics): Crude Birth Rate, General Fertility Rate, Specific Fertility Rate, Total Fertility Rate; Indicators of Reproduction (based on vital statistics): Gross and Net Reproduction Rate, Reproductivity; Indicators of Fertinity based on Censuses and Surveys: Child-Woman Ratio, Child Ever Born, Parity Progression Ratios.

Mortality and its Measurement: Definitions and Indicators: De Jure vs De Facto, Year of Registration vs Year of Occurrence, Crude Death Rate, Specific Death Rate, Infant Mortality Rate, Adjusted Infant Mortality Rate, Neonatal Mortality Rate, Post-Neonatal Mortality Rate, Fetal Death, Perinatal Mortality Rate, Maternal Mortality, Maternal Mortality Rate, Cause-Specific Morbidity and Mortality, Cause-Specific Death Rate, Incidence of Cause (Disease), Case Fatality Rate due to Cause (Disease), Acute Causes (Diseases), Death Rate and Probability of Death, Differentials in Mortality.

Population Change and projection: Rate of Change, Doubling Time, and the Relationship between Age Distinction and Demographic Rates (Population Change, Linear Annual Rate of Change, Linear Annual Growth Rate, Geometric Annual Rate of Change, Exponential Rate of Change, Exponential Growth Rate of Change, Relation between Rates of Change, Rate of Natural Increase, Doubling and Tripling Time, Age Distribution and Demographic Rates).

Medical Demography Analysis: Dynamics of morbidity, disability, and mortality; Consequences of health, sickness, accidents, disability, and death for the size, composition, and structure of the population; The economic, social, and policy impacts of morbidity, disability, and mortality ; Why is Mortality Declining and Life Expectancy Increasing ?

Community Health Practice 3 Credits (00- 00 - 45)

Community health practice represents one of three practical training courses in Public Health in the curriculum of medical studies for which the teaching of the principles of primary health care is one of the priority pillars. Community health practice intervenes at a level of training where it permits the first direct interaction with the community by the student.

1. **General objective**

The practical training course of 2 weeks in community Health Practice has as objective to familiarize the student with the exercise of establishing the diagnosis of the health situation of communities. At the end of the practical training course., the second year medical student should be capable to: i) identify and describe the risks of illness in the community associated with the environment; ii) describe the administrative and sanitary or health organization of a neighborhood and iii) describe the therapeutic resources at the disposal of the population of the community whin faced with a health problem.

2. **Specific objectives**

The practical training course should give the student aptitudes to be able to:

- Describe the administrative organization of the practical training site;
- Describe the health structures of the training site;
- Describe the environment of the training site;
- Observe and describe vectors of disease in the environment (mosquitoes, and other vectors of disease);
- Describe the means of waste disposal (household waste, used water, type od latrines etc.);
- Identify and describe risk factors for disease associated with the environment;
- Establish priorities amongst the health problems observed;
- Identify and describe the means used by the population to remedy these problems;
- Identify and describe the different therapeutic resources found in the training site;
- Identify and describe the different models of mutual aid (and their impact) of the training site;
- Identify and describe the perception of health personnel in the community (communication, disponibility, quality, empathy etc);
- Describe the community's response vis-à-vis health problems (dialogue structures, associations, mutual health insurance…) ;
- Describe and identify basic principles of techniques of health promotion at the level of the community;
- Participate at the different stages of a survey at the level of the community (sampling, data collection, summary analysis).

3. **Activities/tasks**

a. Describe the administrative organization of the training site;
b. Describe the health area of the training site;
c. Describe the organization of the health facility of the training site;
d. Make an observation of the community in its milieu to identify in the environment risk factors for disease;
e. Make an observation to identify how the community remedies the identified risk factors;

f. Describe vectors of disease observed at the training site;
g. Describe the community's response vis-à-vis problems of health;
h. Classify the identified risk factors according to categories (biological, socio demographic, economical, environmental, political and cultural);
i. Discuss with families to identify their perception of health problems (nature of problems, acute and chronic problems, mental health, formal and informal systems of health, formal and informal systems of mutual aid etc);
j. Describe the needs expressed by the population vis à vis problems of health;
k. Describe the models and criteria for the choice of mutual aid in the community with respect to health problems observed;
l. Analyze the experience of the relationship established with the families (strong and weak points);
m. Describe the individual and collective management of household waste;
n. Contribute in the elaboration and execution of a health promotion campaign;
o. Carry out a sampling procedure amongst the inhabitants of the training site;
p. Carry out a survey in the community by administering a questionnaire based on a priority health problem identified;
q. Participate daily on debriefing sessions.

Epidemiology and Applied Biostatistics 5 Credits (60 - 15 - 00)

Objectives: To permit students to acquire knowledge and the ability necessary to realize and interprete epidemiologic studies.

Course Content:

a) Epidemiology:
   - Definition, History and contributions of epidemiology,
   - Design strategies in epidemiologic research
   - Measures of disease frequency: prevalence, incidence, morbidity and mortality rates, case fatality rate, attack rate, crude, category specific and adjusted standardized rates; measures of association: relative risk, attributable risk, attributable risk –percent; odds ratio.
   - Types of epidemiologic studies: cross sectional, cohort, case control, intervention studies.

b) Description and analysis of epidemiologic data.
   - Presentation and summarization of data: Types of variables, data presentation, summary statistics, measures of central tendency, measures of spread or variability.
   - Evaluating the role of chance: inference, hypothesis testing, estimation! Confidence interval etc.
   - Evaluating bias: types of bias, control of bias
   - Evaluating the role of confounding, nature of confounding, methods to control confounding
   - Statistical tests of significance.

c) Epidemiology in disease control: Screening

- Diseases appropriate for screening

- Screeming tests: sensitivity and specificity, reliability.
- Evaluation of screening programmes: feasibility (positive and negative predictive values) effectiveness.

Health System Management and Administration, Legislation 2 Credits (30 - 00 - 00)

Objectives:

- This course is destined to acquaint students with the organization and functioning of the health care system particularly as it operates in Cameroon.
- Acquaint the student with indepth notion of administrative and management techniques which may be useful in his future carrier as team leader
- Acquaint him with the elaboration and the execution of decisions relative to the budget (in Cameroon) as well as management of accounts and finances.

Couse Content

- The health care system in Cameroon
- Notion of the health pyramid
- Notion of referral and counter-referral
- Public Health programmes and projects
- Definition of dialogue structures and their functioning at Health District Level
- Notion of community participation
- Notion of cost recovery
- Communication and conduct of meetings
- Initiation in the management and organization of health services
- Elaboration of a development plan of a health unit
- Management of human resources
- Finance law: Budgetary characteristics and principles; procedures for the preparation and execution of the budget; basic notion of financial accountability; calculation of salaries and paid leave; stock forms and annual management accounts.

Legal and Occupational Health 2 Credits (30 - 00 - 00)

OCCUPATIONAL HEALTH

Objectives: This course is designed to give the students basic notions on occupational health and knowledge of health hazards encountered at the work place.

Course Content:

1. Introduction: Definition and scope of occupational health
2. Organization of occupational medicine
3. Role of the occupational medical doctor
4. Labour accidents (definition, modalities for compensation)
5. Occupational disease (definition, modalities for compensation)
6. Occupational disease due to
   - Solvents
   - Lead
   - Asbestosis

- Noise
- Repeated movements or vibration

7. Impact of work on health

LEGAL MEDICINE

Objectives:

- This course is designed to give the student the basic notions in the application of the principles and knowledge of medical matters that come into relation with both civil and criminal.

Content:

1. Legal medicine – Introduction, definition, Systems.
2. Patient doctor relationship, the announcement of a serious illness
3. The education of a patient with a chronic disease. Personalisation.
4. The medical file, information of a patient and medical secret
5. Medical certificates, death and legislation
6. Collection of organs and legislation
7. Hospitalization at the request of a third party
8. Forced hospitalization (Hospitalisation d'office)
9. Doctor's relationship with colleagues and collaborators
10. Medical, penal and civil responsibility of a doctor
11. Administrative and disciplinary responsibility of a doctor

Community Health (Fieldwork) 2 Credits (00 - 00 - 30)

1. **General objectives:**

The practical training course in community health of a month's duration aims at familiarizing the 4th year medical student with the community approach of health system (health area). The student will carry out the minimum package of activities (MPA) to acquire skills and attitudes permitting him/her to execute the reorientation of primary health care in his/her future functions.

2. **Specific objectives**

- Carry out all curative activities of an integrated health centre while identifying at the same time public health aspects;
- Carry out in collaboration with the head of the health centre all the activities of preventive medicine;
- Develop health promotion activities in the health area;
- Participate actively in the managerial activities of the health area;
- Elaborate a diagnosis of the community health;
- Carry out an operations research on a community health problem identified in the training site.

3. **The different activities**

- Participate actively in all the sessions of antenatal consultations;
- Carry out under supervision all normal deliveries;
- Participate actively in emergency obstetrical and neonatal care;
- Participate actively in the integrated management of childhood illnesses;

- Manage all other illnesses;
- Conduct all other consultations;
- Participate in the execution of the major programmes of public health (EPI, HIV/ AIDS, Malaria, Tuberculosis, Reproductive health);
- Carry out sessions of health education for the promotion of health on a major health problem identified in the area;
- Draw and describe the health map of the health area;
- Present the socio demographic and economic profile of the population of the health area;
- Describe the administrative organization of the health area;
- Describe how health is financed in the health area;
- Describe the system of referral and counter-referral in the health area;
- Describe the functioning of dialogue structures in the health area;
- Use the participate approach to

  Carry out a situation analysis on a theme;

  Identify the most important health problems in the health area;

  Identify priority interventions;

  Carry out an operation's research on one of the problems identified.

Integrated Medical Practice GP 1 30 Credits (00 - 00 - 750)

In the 6th year of medical studies and for a period of **4 months**, the student will undertake integrated medical practice. This means that he/she will carry out activities in the domains of hospital medicine and community health in a health district.

1. General objectives:

1.1. Hospital medicine:

The student will have to demonstrate that he/she has acquired over the years a solid scientific foundation, a solid clinical judgment as well as practical competence in the reception of patients, in clinical and diagnostic evaluation as well as in the management of their ailments. He/she should also be able to establish the prognosis of their patients while not forgetting to refer difficult cases id necessary.

1.2. Community health

The student will acquire competence in the management of the global health of a community. He/She must demonstrate that he/she possesses competences in planification, execution and follow up of community health activities at district level.

2. Specific objectives

2.1. Hospital medicine

- Integrate, collaborate and work with the hospital personnel as member of the team (the medical officer is his/her boss and the student has to work under his/her supervision and responsibility);
- Acquire knowledge especially skills and attitudes that permit him/her to best manage patients in each of the services of the hospital;
- Master the management of a district hospital.

2.2. Community health:

- Acquire scientific competences by applying the principles of epidemiologic methods and operations research to solve health problems of the community;
- Participate in the execution of the main health programmes of the health district (Epi, Malaria, Tuberculosis, Onchocercosis, Reproductive Health etc.);
- Acquire knowledge and practice of the reorganization of primary health care;
- Acquire competences in the execution of follow-up and execution of health programmes and activities;
- Participate in the organization and the organization of epidemiologic surveillance;
    - Apply public health principles to make a community diagnosis at district level;
    - Demonstrate competences in the definition of health needs of the population served;
    - Demonstrate skills in the planification and coordination of health activities in a way as to ensure the optimal utilization of available resources in the district;
    - Demonstrate the capacity to supervise the activities of priority health programmes in the district (EPI, National Programme for the control of HIV/ AIDS, tuberculosis, Malaria, Reproductive health etc.);
    - Demonstrate competences in the monitoring and evaluation of priority health programmes in the district;
    - Be acquainted with the practice of primary health care at district level;
    - Demonstrate the capacity to collect, compile, analyse and exploit health data in a bid to ameliorate services;
    - Use the principles and methods of epidemiology, statistics, research methodology, sociology etc to carry out an operation's research on an identified community health problem of the district.

3. Activities:

Get in contact with the administrative and health authorities of the district.

3.1. Hospital medicine

- Describe the setting and the organization of hospital services;
- Elaborate a precise working programme under the supervision chief medical doctor;
- Carry out the different tasks assigned for each service:
    - Department of Internal Medicine
    - Department of Paediatrics
    - Department of Surgery
    - Department of Obstetrics and gynaecology.

3.2. Community health:

- Participate in the planification and follow-up/evaluation of activities;
- Participate actively in the collection, analysis and treatment of health data;

- Initiate and execute under the supervision of district medical officer, health promotion activities;
- Identify an operation's research problem, collect and analyze data and make recommendations;
- Carry out activities in connection with the main health programmes in the district;
- Participate in cost-recovery activities (co-financing and co-management);
- Participate in meetings of dialogue structures;
- Define population groups by age, sex and geographic location in the district;
- Evaluate health problems and the principal causes of morbidity and mortality in the district;
- Evaluate the health status of the general population and at risk groups;
- Determine the health needs of the population;
- Determine the health priorities of the district;
- Propose strategies for the amelioration of on-going programmes in the district;
- Carry out an operation's research on one of the important health problems in the district.

THESIS PROJECT **30 Credits (00-150-600)**

Objectives:

Permit the student to work on his/her thesis in the service of his supervisor.

Course Content:

- Work in the Service of supervisor
- Write up of research protocol
- Realization of the thesis project.