

FACULTY OF  
MEDICINE  
& SURGERY







## VISION AND MISSION

The Faculty of Medicine, National University -- Sudan strives towards developing the highest standards of academic and clinical excellence. The various parts of this Programme aim to produce ethically responsible, innovative, critically thinking professionals committed to meeting the health and developmental needs of all communities in the Sudan and the rest of the world, appropriately and efficiently. The programme teaches the students how to learn and continue as lifelong learners. The Programme aims to be the most respected of its kind, as evidenced by high quality of premises, up-to-date administration and governance, job- and research-directed instruction, to produce a very high quality of graduates in their ethical, professional and scholarly contribution.

## ENTRANCE REQUIREMENTS

A student interested in joining the Faculty of Medicine, has to:

1. Obtain pass mark in seven subjects including: Arabic language, religious studies, English language, mathematics, physics, chemistry and biology. International students who have not studied Arabic and religious studies may have more alternative subjects from an approved list of subjects published in the webpage of Ministry of Higher Education.
2. Achieve the percentage in Sudan School Certificate announced every year (International students may have 10% less in the School Certificate scores).
3. Apply electronically through the website of the Admission and Accreditation Office, Ministry of Higher Education, or apply directly in Admission Office in the National University, and pass the health examination, aptitude tests and interview at the Faculty of Medicine.
4. Pay the published fees of 40,000 SDG or 8,000. [international students]

## CAREER ADVICE

Students qualified with this bachelor degree [MB BS] pass through the track designated by the Sudan Medical Council, and so are temporarily registered with the Council. After working for a period defined by the Ministry of Health in each discipline/specialization, graduates sit for the licensing exam to obtain permanent registration with the Sudan Medical Council. Qualified graduates serve as general practitioners in the public or private sector. They may upgrade to MD/PhD or licenses in basic sciences from public view in the public or private sector, and can qualify for doctor's degree programmes or fellowships in basic sciences (anatomy, physiology, and biochemistry) or clinical sciences (medicine or its sub-disciplines, surgery and sub-disciplines, obstetrics, gynecology, paediatrics, and oncology) or diagnostic (pathology, immunology, microbiology, radiology and ghost imaging) or community medicine (community medicine and public health, health statistics, and forensic medicine) to qualify

as a consultant in any of the mentioned disciplines to work in the healthcare services and/or in university teaching. The graduate may be interested in managerial, commercial, industrial or charity career, related to one of the various specialties in the discipline.

International graduates can follow the same track if they preferred to stay in the Sudan, but may also start their registration and internship in their own countries or residence

## FACULTY OBJECTIVES

The objectives of the National University Faculty of Medicine are to:

1. Emphasize values and ethical heritage of the Sudanese Nation in its curriculum, and follow strategies that lead to strengthening these values, as an important component of the National University philosophy and message.
2. Graduate a practitioner with a Bachelor of Medicine and Surgery (MB BS), with strong community orientation and ethical components.
3. Contribute to community development through health services provided in its own health institutions and other institutions co-operating with it, through the following: (a) partnership in designing health programmed and plans, and implement whatever is feasible in utilizing the experience of specialists, (b) Contribution in continuous education through short and long term courses, to improve efficiency of health workers, and (c) Provision of essential equipments and supplies to improve quality of services, through partnership with the Ministry of Health.
4. Strengthen medical and health research, making use of the University's accessibility and communication privileges.

## CURRICULUM OBJECTIVES [Characteristics of the medical graduate]

A graduate of the National University Medical Curriculum should be able to :

1. Adopt the strategies of the National University-Sudan and abide by its objectives and rules stated in its charter.
2. Observe in his/her practice, the health professional ethics which agree with the Nation's values, beliefs and norms (as stated by Sudan Medical Council), and maintain good and honest relations with his/her patients, their families, his/her colleagues across all sectors involved in health.
3. Appreciate the value of diversity and multi-ethnicity in solving health problems with emphatic, humane and fair practice.
4. Diagnose and manage cases of endemic and epidemic diseases, and other health problems prevalent at the level of the individual, family or society, with special emphasis on the nutritional and environmental problems common in developing countries, and plays an active role in health promotion.
5. Integrate basic, community and clinical sciences in solving community, family and individual health problems.
6. Use scientific knowledge in diagnosis and management of health problems, according to known methods of problem solving and integration, and explains the scientific structural (anatomical), functional (physiological, biochemical), morbid (microbiological, pathological), and therapeutic (pharmacological) background related to the problems [problems in integrated medical sciences, clerkships], with full awareness of evidence-based practice.
7. Manage emergencies, and decide and act properly on cases needing referrals to specialized centres or personnel. Be aware of ambulance and patient transfer facilities and contacts.
8. Accepts to work in all settings according to needs, and act to improve health service delivery systems both quantitatively and qualitatively.
9. Encourage community participation and act in recruiting various sectors in defining health and health-related

problems, planning and providing suitable solutions, recognizing the community beliefs, ethics, and traditional practices, and remain accountable to their society.

10. Adhere to "health team" approach, acting as an efficient member, capable of its leadership, dividing labor and responsibilities among its members, and ensuring both effectiveness and homogeneity among the members.
11. Administer a health "unit" or "centre" efficiently according to scientific, medical, statistical, economic and legal bases.
12. Continue to consider elements of efficiency, costing and economic implications in his/her diagnostic and therapeutic choices.
13. Acquire the skills of teaching, learning and communication efficiently to carry out her/his duties in health education and in winning the confidence of patients and their families and societies.
14. Acquire the skills of self-learning, and contribute to availing opportunities for planning and implementing continuous education activities to upgrade his/her own abilities and those of his/her colleagues in the health team.
15. Carry health or health-related research, alone or with a health team, using scientific methods known in such activities.
16. Use computer in word processing, statistics and graphics to achieve success in other objectives of his/her career.
17. Acquire postgraduate qualification in the discipline of his/her choice, recognizing the needs of the society for certain specialties, particularly general practice and family medicine.

## EDUCATIONAL STRATEGIES AND METHODS

The learning strategies emphasize the following: (1) early acquisition of basic clinical skills- including communication, (2) student-centered learning, and maximum student responsibility in the learning process, (3) problem-based and problem-oriented learning, (4) community-oriented and community-based activities, (5) integration of basic science, community and clinical practice in a multidisciplinary approach, (6) self- and peer education and evaluation, (7) team-work approach, (8) a wide range of electives, (9) continuous evaluation, (10) preparation for continuous education.

The Faculty of Medicine adopts the following methods in the daily programme of activities: (1) problem-based learning (PBL) sessions- one problem/ week at most, (2) seminars and small group discussions –once/ week at least, (3) field practice in rural and primary health care settings and societies not less than 1/5<sup>th</sup> of the timetable, (4) practical sessions (laboratory, clinical) not less than 1/4<sup>th</sup> of the curriculum timetable, (5) skill laboratory (weekly) sessions, (6) lectures -not more than 1/3<sup>rd</sup> of the curriculum timetable (not more than 3 lectures/day), (7) educational assignments, reports and research activities (as many as the programme and time would allow), (8) electives -about 10% of the curriculum timetable- (about 2 hours/semester).

## TIMETABLE

The programme is of five years' (10 semesters') duration divided into three phases, comprising about 200 CHs. A semester is 18-20 weeks in Phase 1 and 2, and 22-24 weeks in Phase 3. There are three compulsory Summer courses and at least five electives; credit hours of electives taken by the student will be included in the total.

Phase 1: Introductory courses and University requirements	= Semesters 1
Phase 2: Integrated basic science organ system courses	= Semesters 2-6
Phase 3: Clerkships	= Semesters 7-10

### Semester 1 [24 CHs- 18 weeks]

	Title	Code	Weeks	Units			CH
				Th	Tut	Prac	
1	Islamic studies-1	ISLAM-111	Longit.	2	-	-	2
2	Arabic language-1	ARAB-112	Longit.	2	-	-	2
3	English language-1	ENG-113	Longit.	2	-	-	2
4	Sudanese studies-1	SUDN-110	Longit.	2	-	-	2
5	Biostatistics	ME-STAT-117	Longit.	2	-	-	2
6	Orientation week	-	-	-	-	-	-
7	Computer science-1	ME-COMP-116	3	1	-	1	2
8	Physics for medical equipments & investigations	ME-PHYS-115	3	3	-	-	3
9	Introduction to medicine and medical education	ME-EDU-114	3	1	1	1	2
10	Basic biochemistry	ME-DIS-212 A	2	2	1	1	2
11	Computer science-2	ME-PAR-125	2	2	-	1	2
12	Genetics & molecular biology	ME-GET-119	2	2	-	-	2
			16	21	2	4	23

### Semester 2 [22 CHs- 17 weeks]

	Title	Code	Weeks	Units			CH
				Th	Tut	Prac	
1	Islamic studies-2	ISLAM-121	Longit.	2	-	-	2
2	Arabic language-2	ARAB-122	Longit.	2	-	-	2
3	English language-2	ENG-123	Longit.	2	-	-	2
4	Sudanese studies-2	SUDN-120	Longit.	2	-	-	2
5	Introduction to medical ethics	ME-ETHIC-226	Longit.	2	-	-	2
6	Growth and development	ME-GROW-126	3	1	-	1	2
7	Man and his environment	ME-ENV-127	4	3	2	-	4
8	Behavioural science	ME-BEHAV-119	3	2	-	-	2
9	Principles of disease-I	ME-DIS-212 A	3	1	-	1	2
10	Medical entomology and parasitology	ME-PAR-125	3	1	-	1	2
			15	18	3	3	22

Examination of longitudinal courses (+re-sits)

2 weeks

SUMMAR 1: Medical records and data collection (ME-SUM-131) = 2 CHs

Elective (E-132): A 1000 –word report on “Internet Sources of Health Sciences” 2CH

### Semester 3 [20 CHs - 20 weeks]

	Title	Code	Weeks	Units			CH
				Th	Tut	Prac	
1	Professional skills-1	ME-SKIL-211	Longit.	2	-	-	2
2	Principles of disease-II	ME-DIS-212 B	3	2	-	1	3
3	Blood and lymph	ME-HEM-316	3	2	-	1	3
4	Immunology	ME-IMM-216	2	2	-	-	2
5	Cardiovascular system	ME-CVS-214	6	3	1	1	3
6	Respiratory system	ME-RES-213	5	3	1	1	3
			19	14	2	4	16

Examination of longitudinal courses (+re-sits) 1 week

FIRST YEAR PROGRAMME EVALUATION

### Semester 4 [17 CHs- 21 weeks]

	Title	Code	Weeks	Units			CH
				Th	Tut	Prac	
1	Professional skills-2	ME-SKIL-221	Longit.	-	-	2	2
2	Primary health care	ME-PHC-215	3	1	-	1	2
3	Musculoskeletal system	ME-MSK-223	5	1	1	2	4
4	Nutrition and metabolism	ME-NUT-224	4	2	1	-	3
5	Gastrointestinal system	ME-GIT-225	6	2	1	2	5
6	Research methodology	ME-RES-227	2	2	-	-	2
			20	12	2	4	17

Examination of longitudinal courses (+re-sits) 1 week

Examination of longitudinal courses (+re-sits) 1 week

SUMMAR 2: Research methodology and scientific writing (ME-SUM231) 2 CHs

Elective (E232): Draw a map of health services in one Mu'tamadiya =2 CH

SECOND YEAR PROGRAMME EVALUATION

### Semester 5 [18 CHs- 19 weeks]

	Title	Code	Weeks	Units			CH
				Th	Tut	Prac	
1	Professional skills-3	ME-SKIL-311	Longit.	-	-	2	2
2	Basic epidemiology- Research Projects introduction	ME-EPI-322	2	1	-	1	2
3	Epidemiology of endemic and non-endemic diseases	ME-EPI-312	3	1	1	1	3
4	Urinary system	ME-URO-313	5	3	1	1	5
5	Reproductive system	ME-REP-314	4	2	1	2	5
6	Endocrine system	ME-ENDO-315	4	3	-	1	4
			18	10	3	6	18

Examination of longitudinal courses (+re-sits) 1 week

### Semester 6 [20 CHs- 21 weeks]

	Title	Code	Weeks	Units			CH
				Th	Tut	Prac	
1	Professional skills-4	ME-SKIL-321	Longit.	-	-	2	2
2	Head and neck	ME-HAN-322	3	1	-	1	2
3	Nervous system and special senses	ME-CNS-323	8	4	1	3	8
4	Tropical medicine and endemic diseases	ME-TROP-324	2	1	-	1	2
5	Basic pharmacology and therapeutics	ME-PHARM-325	4	4	-	-	4
6	History and physical examination	ME-CLIN-326	3	1		1	2
			20	11	1	8	20

Examination of longitudinal courses (+re-sits) 1 week  
 SUMMAR 3: Rural Hospital Residency (ME-SUM-331) 2 CHs Block 2 weeks  
 Elective (E332): A 1000 work essay on management of an emergency 1CH  
 THIRD YEAR PROGRAM EVALUATION



### Phase 3: Clinical clerkships

#### Semester 7-10 – Clerkships or Hospital Department Rotations=76 CHs

Four semesters, 16 modules of four major rotations, five longitudinal courses including two elective.

#	Rotation Groups	Disciplines (symbol-number)	Credit Hours	Duration (weeks)	Longitudinal Courses
1	A	Internal Medicine (ME-MED-411)	14	12	(16) Elective-British-American Professional Examinations- (E-524) 2 CHs (Semester 9 & 10)  (17) Evidence-Based Medicine (ME-EBM-525)- 2 CHs
2		Dermatology (ME-DERM-413)	2	2	
3		Emergency Medicine (ME-MER-412)	4	4	
4	B	General Surgery – including anesthesia (ME-SURG-421)	12	12	
5		Orthopedics (ME-ORTOP-422)	4	4	
6		Ophthalmology (ME-OPTAL-423)	2	2	
7		Ear, Nose and Throat (ME-ENT-424)	2	2	
8	C	Psychiatry (ME-SYC-512)	4	4	
9		Obstetrics and Gynecology (ME-OBGYN-511)	12	12	
10		Family Medicine (ME-FAM-513)	3	3	
11		Medical professionalism (ME-PROF-415)	2	2	
12		Forensic medicine (ME-LAW-522)	2	2	
11	D	Pediatrics (ME-PED-521)	11	11	
12		Health Economics and Hospital Management (ME-HM-523)	2	2	
13		Radiology and imaging (ME-RAD-414)	2	2	

Rotation of the groups is as follows:

Semester 7 =	A	B	C	D
Semester 8 =	B	C	D	A
Semester 9 =	C	D	A	B
Semester 10 =	D	A	B	C

#### CLERKSHIP EVALUATION AND GRADUATION

##### IMPORTANT

Detailed specific objectives can be seen in the Medical Curriculum Manual. A clerkship booklet is provided to students in the first session in the clerkship. It is the students' responsibility to work towards achieving the objectives included, irrespective of the educational activities offered during the block. The objectives represent the minimum required competences for these clerkships.

## COURSE OUTLINE

Detailed behavioural objectives, skills, assignments and problems are listed in each course book. The lists are too extensive to be included below:

### Phase 1: Semester 1, Preliminary Courses (College Requirements)

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
ISLAMIC STUDIES	ISLAM-111+121	1and 2/Longitudinal	4+4

This is a National Requirement compulsory to all Muslim Students, which includes two courses: 111 in Phase 1, and 121 in Phase 2. Their contents are: (1) the recitation of two Suras of the Holy Quran, which introduces a lot of behavioural and ethical issues for mankind as well as for Muslims, (2) the basic sources of religious thought and religious groups, (3) the principles of deriving a religious rule relevant to the medical profession, and (4) review the Fatwa's likely to come as a request from the community to the health team member working in that community, and all problems that may arise from emerging issues that require ethical discussion, leading to better understanding between individuals in groups, to live in a peaceful and constructively save environment and society.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
ARABIC LANGUAGE	ARAB-112+122	1and 2/Longitudinal	4+4

This is a National Requirement compulsory to all Arabic Speaking Students, which includes two courses: 112 in Phase 1, and 122 in Phase 2. It includes: (1) the basics of Arabic language grammar that would allow students to read and write correctly, (2) pronunciation and punctuation of an Arabic text, (3) summarizing and abridging a lengthy Arabic text, (4) abstracts of Arabic poetry, and (5) principles of translation of scientific text between Arabic and English languages.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
ENGLISH LANGUAGE	ENG-113+114	1and 2/Longitudinal	4+4

The sources of most health information in the World are in English. The Internet navigation to obtain information is basically in English. Some of the patients, attending clinics in Sudan, may only speak English language, especially with open-up of borders with economic development and of globalization. Passing the English language examination is an essential entry requirement to universities in Sudan. The general objectives of this course include: (1) correct pronunciation of medical terms, (2) correct reading and understanding of texts from medical books, (3) expressing one's self in good English describing his daily activities, career ambitions, present problems in health and current attempts at management, and (4) translating some pieces from English to Arabic, and others from Arabic to English, both from medical literature..

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
SUDANESE STUDIES 1,2	SUDN-110+120	1and 2/Longitudinal	4+4

This is a National Requirement compulsory to all Students, which includes two courses: 110 in Semester 1, and 120 in Semes 2. It includes: (1)the geographic profile of the Sudan, (2) classification of the population and their

distribution all over the country, (3) discussion and comparison of the various historical era of the Sudan, (4) main features of Sudanese economy, (5) educational policies and administrative rules in the country, (6) political systems that has governed the Sudan, (7) the legal system, (8) Sudan identity and culture, (9) elements of unity and harmony in social fabric, and (19) issues of diversity and cultural unity.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
BIostatISTICS	STAT-117	1/Block 2 weeks	2

A two-week module on basic statistics as applied to health, to include: (1) introduction to statistics, (2) probabilities, (3) data summary, (4) presentation; measurement of central tendency; interpretation of variation (dispersion), (5) population means, (6) normal distribution; confidence interval, (7) frequency distribution, (8) sampling techniques, (9) calculation and interpretation of the concept of confidence interval, (10) the concept of p-value and its interpretation, (11) the normal and skewed frequency distribution of biomedical data, and (12) how to apply the appropriate test of significance for a given data set and a given research methodology (using t test as an example).

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
COMPUTER SCIENCE-1	COMP-116	1/Block 2 weeks	2

This is a 2-week block that introduces the following facts: (1) textbooks of medicine and allied sciences are available on CDs, in which a large volume of knowledge is saved and easily retrievable, (2) there are many software packages demonstrating methods and techniques in clinical skills including patient rapport in history taking, clinical examination, investigations and management, (3) students and teachers access the internet for the unlimited sources of information, both at their professional level and public level for health education, (4) students and future doctors are educators who have to prepare smart documents and presentations for the health team and profession at large, (4) knowledge of programmed like Word, Excel, and PowerPoint is indispensable for anyone learner or teacher, (5) computer is important for students both in the developed or developing world, more so for the latter, who might not have inherited voluminous libraries in their colleges and have to utilize the virtual libraries available all over the world, (6) medical journal as hard copies are difficult to be owned by one institution, now, most are available on-line for those who can use the computer efficiently.

The course is intensive focusing on the basic principles of (1) computer electronics and applications relevant to health science education, (2) hand-on experience in dealing with famous programmed like DOS, Word, Excel, PowerPoint, Access and Internet Explorer, (3) the use of CDs is extensively covered as well as having e-mails and navigating the internet for health information, (4) how to access medical journals, and communicate with scientists worldwide.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
PHYSICS FOR MEDICAL EQUIPMENTS AND INVESTIGATIONS	PHYS-115	1/Block 3 weeks	2

The basic principles of general physics are important for understanding certain mechanisms that take part in the human body, and also, the technical background of many medical types of equipment. A medical professional is often confronted with a method of investigation or intervention that is based on physical or mechanical process in the human being and he/she has to deal cautiously with the machine and use it correctly considering its proper

maintenance and patient's and worker's safety. These include physical chemistry, gas laws, physics of light and sound, and radiation. The details of the contents include; (1) physical quantities and units, (2) measurements techniques, (3) gases and gas laws, (4) waves, (5) optics, and (6) radiation.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
INTRODUCTION TO MEDICINE AND MEDICAL EDUCATION	ME-EDU-114	1/Block 3 weeks	2

This is a three-week (2 CHs) block, starting with a simple medical problem that emphasize: (1) the meaning and message of health and health care delivery system in the country, (2) the role of the physician in, other professional and administrative staff in health care, (3) priority health problems, (4) concepts and principles of learning, (5) adult education and learning, (6) student centered learning, (7) problem-based learning, (8) instructional techniques (lecture, small group etc), student assessment methods, (9) holistic approach, inter-disciplinary and partnership concepts, (10) curriculum development, (11) programme evaluation, (12) leadership and (13) professional ethics. Students are divided into groups to spend a week in a health facility, hospital theatre, hospital outpatient, health centre, various directorates and departments of Federal and State Ministries of Health, etc.. Meanwhile students are given discussion sessions on group dynamics and instructional methods, at the end of the course the groups present their field activity using a suitable audiovisual technique. Evaluation assesses the knowledge and attitudes of the students in these three areas: health system, group dynamics and instructional methods.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
BASIC BIOCHEMISTRY	BIOCH-118	1/Block 3 weeks	2

A three-week block in Semester 1, to include: (1) structure of essential macromolecules, (2) biological molecules which play important biomedical roles, (3) different types of carbohydrates, (4) physical and chemical properties of carbohydrates, proteins and lipids, (5) classification of amino acids, polypeptides and proteins, (6) the role of three-dimensional structure of proteins in protein function, (7) the nature of catalysts and enzymes and their roles in chemical reactions in the living cells, (8) properties of enzymes and their classification, (9) the differences between simple, complex and derived lipids and their biological importance, (10) the nitrogenous bases: purine and pyrimidine, (11) types of nucleotides- purines and pyrimidines, (12) types of molecules of nucleic acids, (12) in vitro distinction between the different types of carbohydrates, (13) in vitro detection of carbohydrates and amino acids in given material.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
GENETICS AND MOLECULAR BIOLOGY	ME-GENT-119	1/Block 2weeks	2

A two-week block in Semester 1, that considers the structure and function of the DNA and organization of human genome and molecular biology in health and disease. It will include: (1) atomic structure, (2) protein synthesis, (3) chromosome structure, function and structural defects, (4) basic pathways and mechanisms in biological energy transduction and oxidation of metabolites to synthesis of ATP, (5) role of major gene regulatory proteins and molecules including signal transduction and cell cycle control, (5) common features of genetic diseases, and give difference examples of types of genetic diseases (6) properties of cancerous cells as relation to mutational changes, (7) molecular diagnosis and research, (8) human genome project, (9) forensic genetics, and (10) ethics in genetics and stem cell research.

## Phase 2: Semesters 2-6, Organ System Courses

Islamic studies (ISLAM-121) - 4 CHs longitudinal (See ISLAM-111).

Arabic language (ARAB-122) - 4 CHs, longitudinal (See ARAB-112)

English language (ENG-123) -4 CHs longitudinal (See ENG-113)

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
MEDICAL ENTOMOLOGY AND PARASITOLOGY	ME-PAR-125	2/Block 3 weeks	2

Insects have tremendous potential for transmitting disease in human and other animals. The disease-causing organisms include protozoa, viruses, bacteria, and worms. The most deadly disease worldwide is malaria which is transmitted by mosquitoes. Mosquitoes can also transmit viruses (including those causing encephalitis) and filarial nematodes. Other vectors include flies and ticks.

This is a three-week (3 CHs) block, concerned with: (1) vector and organisms surveillance and control, considering the operational control personnel as one of the health team, (2) special emphasis on insects and closely related arthropods that impact human health, (3) the life cycles of the vectors and parasites, their geographical distribution, ecology, and (4) the epidemiology, presentation and broad management and control of the diseases caused by them. These include parasites of the intestinal tract, blood-borne parasites and those found in other body sites.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
GROWTH AND DEVELOPMENT	ME-GROW-126	2/Block 3 weeks	2

This is a three-week block on: (1) general embryology: (a) reproductive organs, (b) gamete formation, (c) fertilization, (d) implantation, (e) organogenesis, (2) subsequent morphological changes in the human development during: (a) prenatal, (b) postnatal, (c) childhood, (d) preschool, (e) school age, (f) adolescence, (g) adulthood and older age (both physical and psychological) changes, (3) teratogens and congenital anomalies. Students should visit various health institutions to learn about (1) antenatal setup, (2) labor room, (3) child care Centre and growth monitoring charts, (4) milestones and abnormalities of physical growth, (5) maternal and child health care, (6) geriatric care. Students should become familiar with the special features of all these stages and also gain knowledge about (7) the role of health care providers at the different phases of human life in accordance to the specific needs of each phase.

The course is planned to achieve these objectives through the different problems submitted in this block book and tutorials augmented by laboratory skills and clinical skills tutorials in addition to student interactions with the subject specialists. The students will visit health Centres and get acquainted with the health care delivery system with reference to antenatal care, pediatric care, immunization, and care of older people.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
MAN AND HIS ENVIRONMENT	ME-ENV-127	2/Block 4 weeks	4

This is a 4-week (4 CHs) block on the inter-relation between Man's internal and external environments to include: (1) basic concepts of internal physiologic activities, (2) body fluids, (3) acid-base balance, (4) biological membrane, (5) body systems (respiratory, gastrointestinal, nervous etc..) exposed to environment, (6) impact

of environment on health, (7) health consequences of exposure to potential environmental hazards (physical, chemical and biological), (8) multi-disciplinary approach to environment, (9) the role of the international organizations interested in environmental protection, (10) principles of epidemiology, (11) biological spectrum of environmental diseases, endemic and epidemic.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
PROFESSIONAL CLINICAL SKILLS	ME-SKIL-211+221 +311+321	3,4,5 &6/ Longitudinal	8 (2 each semester)

This is a two-hour weekly session during semesters 3, 4, 5 and 6 to include: (1) communication skills of speaking, hearing, listening, recognizing strengths and weaknesses of close-ended and open-ended questions, non-verbal communications, establishing rapport, interview and be interviewed, dealing with a difficult patient, (2) taking history and perform examination of respiratory and cardiovascular systems, specifically taking respiration rate, temperature, locate palpable arteries, and accurately take pulse, blood pressure, (4) take venous blood and recognize normal blood cells, basic blood tests, safety measure in blood taking, administering IV fluids, (5) prepare sputum for detection of mycobacteria, (6) interpret a normal PA chest x-ray, and recognize pneumonia, tuberculosis, and lung mass (7) interpret a normal ECG and that of myocardial infarction, (8) basic life support skills.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
BEHAVIOURAL SCIENCE	BEHAV-119	2 / Block 2 weeks	2

A two-week block during Semester 2, to include: (1) introduction to basics of behavioural science and sociology, (2) introduction to psychology, psychoanalysis and defense mechanism manifesting as behaviours, (2) role of stress in the etiology of physical and psychological illness, (3) coping with loss, grief and death, (4) genetic, developmental and environmental basis of behaviour (5) cultural considerations in medical practice, (6) family structure and dynamics in health care, (6) health and illness behaviour, (7) personality.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
PRINCIPLES OF DISEASE-I	ME-DIS-212A	2 / 3 weeks	2

This is a three-week block on general microbiology to include: (1)revision of general histology, (2) morphology, classification, staining techniques and reactions, and pathogenicity of bacteria, viruses and fungi, (3) sterilization and disinfection, (4) basic concepts in immunity, (5)revision principles of inheritance, introduction to molecular biology, and genetic defects underlying inherited disorders, (6) mechanism of disease production (pathogenesis) including hypersensitivity and autoimmune etiology, (7) host defense mechanisms barriers and those provided by bacterial flora, (8) bacterial growth cycle and ability to grow on artificial media (solid and liquid) making smears, inoculation, recognition of bacterial colonies and recognition of media, and (8) anti-microbial.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
PRINCIPLES OF DISEASE-II	ME-DIS-212B	3 / 3 weeks	3

This is a three-week block on general pathology to include: (1) revision of general histology, (2) general pathology: inflammation, tissue damage and repair, neoplasia and abnormal cell growth, and inherited disorders.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
BLOOD, AND LYMPH	ME-HEMAT-316	3/3 weeks	3

This is a three-week block module that introduces: (1) hemopoiesis, (2) normochromic and hypochromic anemias and iron overload, (3) megaloblastic anemia and other macrocytic anemias, (4) hemolytic anemias, (5) genetic disorders of hemoglobin, (6) the white cells, (7) the spleen, (8) hematologic malignancies: (a) acute leukemias, (b) chronic myeloid leukemia, (c) chronic lymphoid leukemia, (d) myelodysplasia, (e) Hodgkin's and non-Hodgkin's lymphomas, (f) multiple myeloma, (g) myeloproliferative disorders, (9) aplastic anemia and bone marrow failure, (10) platelets, blood coagulation and hemostasis, (11) Bleeding disorders, (12) coagulation disorders, (13) thrombosis and anti-thrombotic therapy, (14) blood transfusion, and pregnancy and neonatal hematology.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
IMMUNOLOGY	ME-IMM-216	3 / 2 weeks	2

This is a two-week block module that introduces: (1) basic aspects, normal structure and function of the immune system, (2) mechanism of immune disorders, (3) differences between "innate" and "adaptive" immunity, (4) the roles of lymphocytes, macrophages, dendritic and NK cells, (5) the terminology and roles of cytokines, (6) various types of hypersensitivity reactions, (7) common features of autoimmune diseases including etiology, pathogenesis, morphology and clinical expression of systemic lupus erythematosus, rheumatoid arthritis, Sjogren's disease, mixed sclerosis (scleroderma), mixed connective tissue disease. And poly (aka, peri-) arteritis nodosa, (8) differences between primary (genetic) and secondary (acquired) immune deficiencies, (9) morphology, etiology, pathogenesis and clinical expression, and (10) concept, aim and protocols of vaccination.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
CARDIOVASCULAR SYSTEM	ME-CVS-214	3/6 weeks	5

This is a six-week block module on the structure, functions and disorders of the heart and blood vessels. It includes: (1) morphology of the heart, (2) its blood supply, (3) various peripheral blood vessels, (4) structure of cardiac muscle, contraction of cardiac muscle, (5) electrical activity of the heart and normal ECG tracing, (6) cardiac cycle and cardiac output, (7) blood pressure regulation, (8) hypertension, (9) coronary arteries and ischemic heart disease, (10) rheumatic fever and valvular heart disease, (11) heart failure, (12) cardiomyopathies, and (13) essential drugs used in cardiovascular disease.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
RESPIRATORY SYSTEM	ME-RES-213	3/5 weeks	5

This is a five-week block module, to include: (1) describing the anatomy of the thoracic cage, muscles, diaphragm, upper and lower respiratory tract (including nasal cavity, larynx, trachea, bronchial tree, lungs, pleura), mediastinum, mechanism of respiration, (2) physiological and biochemical bases of normal lung functions and volumes, gas exchange in lung and tissues, gas transfer, (3) pathological and microbiological aspects in airway disease, respiratory pathogens, respiratory infections, (4) skills of taking history and performing physical examination to elicit physical signs, prepare a list of differential diagnosis and suggest suitable investigations, (5) given one of the following problems/conditions: pneumonia, foreign body inhalation, bronchial asthma, pleural

effusion, pneumothorax, tuberculosis, mediastinal masses, ca bronchus. The student will be able to use basic and clinical sciences to outline diagnostic criteria and management, and show impact on family and community, (6) role of inherited, environmental and occupational factors in respiratory disease.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
COMMUNITY MEDICINE PUBLIC HEALTH 1 (PRIMARY HEALTH CARE, 2 (BASIC EPIDEMIOLOGY), AND 3 (EPIDEMIOLOGY OF ENDEMIC DISEASES)	ME-PHC-215, M-EPI- 312 and ME-EPI-322	4,, 5 and 6/ Block or Longitudinal	3+2+2 (TOTAL 7)

This is a series of 3 longitudinal block module during Semesters 4, 5, and 6. They may be taken in block modules. They consist of: (1) theoretical studies on health system research, (2) the socioeconomic, psychological, behavioural and environmental factors related to health, epidemiology of disease and its effects on management, (3) primary health care, (4) weekly community visits to health centres and villages trying to: (a) understand the health problems, (b) help the local people and authorities in suggestions and (c) involvement in solving them.

This is possible through the study of (1) epidemiology, the methods used in community medicine to investigate epidemics, (2) maternal and child health, (3) health delivery system research and (4) control of endemic and communicable diseases.

The longitudinal modules are called ME-PHC-215 (2<sup>nd</sup> Year), ME-EPI -312 and ME-EPI- 322 (3rd Year). The division of the curricular content of the community modules is based on the activities conducted in the field and the research project identified by the students. .The course is based on theoretical sessions in the College and practical training in the PHC Centres.

The purpose of this undergraduate curriculum in community medicine is to expose the students to the health problems of the community in order to understand the principles of care of defined populations, based on cost-effective and scientifically sound methods. The curriculum aims at producing doctors who can understand health in socio-psychological and economic milieu and devise a holistic approach towards care of the individuals, families and communities. The curricular approach also imparts hands-on training for conducting operational and other research as well as critically appraising scientific literature to keep updated.

The course is essential for the students to understand health and its determinants together with the factors responsible for disease. This course is offered to facilitate students to acquire the knowledge and skills for providing basic promotive, preventive and curative care at the primary and secondary levels. The students would understand the basic concepts of epidemiology to apply it in understanding health statistics, investigating epidemics and designing small research projects. They will be able to apply these concepts in understanding and evaluating medical literature.

The courses also cover the essential elements of reproductive health that is practiced in the PHC set-ups creating a broad understanding of issues of reproductive health, and safe motherhood and adolescent health. Inappropriate handling at this critical stage of development may lead to serious consequences ranging from deviant behaviour to indulgence in criminal activities.

The course content would strengthen the knowledge base for research. The basic concepts of analytic epidemiology are required for answering research questions. Applied biostatistics is essential for analyzing and



interpreting data obtained in the research project. In addition, the courses touch on occupational health problems and provide orientation to hazards at work places and environment. They understand and manage problems in the care of old people. These aspects are consolidated in other courses.

- ❖ The following courses are proposed as replacement and reorganization of the community medicine courses. They are still awaiting approval by the scientific council. Their details are as follows:

<b>Title</b>	<b>Code</b>	<b>Semester/Duration</b>	<b>Credits</b>
EPIDEMIOLOGY	ME-EPID-312	4/2 weeks	2

This two-week block in semester 4 includes: (1) basics of epidemiology (2) theoretical studies on health system research, (3) the socioeconomic, psychological, behavioural and environmental factors related to health, and epidemiology of disease (4) determinants of health, (8) the concept of screening and its role in health promotion and disease prevention, (9) demographic characteristics of Sudan, (10) and the application of epidemiology in disease process with respect to person, place and time.

<b>Title</b>	<b>Code</b>	<b>Semester/Duration</b>	<b>Credits</b>
PRIMARY HEALTH CARE	ME-PHC-322	4/3 weeks	3

This 3-week block in semester 4 consists of theoretical studies on health system, the socioeconomic, psychological, behavioural and environmental factors related to primary health care. This course is devoted to expose students to health Centres and rural areas to identify the local health problems and help the local people and authorities in solving them. This is made possible through health research and community medicine studies to investigate problems like child and maternal health, and control of endemic and communicable diseases. The course touches on occupational health and environmental hazards.

<b>Title</b>	<b>Code</b>	<b>Semester/Duration</b>	<b>Credits</b>
RESEARCH METHODOLOGY	ME-SEARCH-227	5/2 weeks	2

This is a two-week module in which the student learn the basics of research including: (1) selection of an appropriate research problem, based on priorities, (2) evaluation of a research article, (3) the steps in conducting research, (4) searching the literature, (5) developing hypothesis, (6) identification of research population and sample size, (7) obtaining consent, (8) data collection, (9) data analysis, (10) interpretation of findings, (11) presentation and defending results, discussion, conclusions and summary (12) observing all ethical issues in every step of research. By the end of this course, students are expected to write their own research proposals.

<b>Title</b>	<b>Code</b>	<b>Semester/Duration</b>	<b>Credits</b>
GRADUATION PROJECT	ME-EPID-215	5/3 weeks longitl	3

This 3-week block in semester 5 follows the epidemiology and research methodology courses. Students are expected to start the course by revision and finalization of their research proposals, the result of work done in the research methodology course. In this course, students are expected to: participate in organized community visits to health centres and villages to: (a) identify the local health problems, (b) and help the local people and authorities in finding solutions. Students are expected to apply the theoretical knowledge in research methodology to design their study, decide on the sample, collect and analyze the data. Expert supervisors will

have regular meetings with the students groups over semester5, 6, and 7, to monitor the research process. Each group would submit a written thesis and dates for presentations would be specified.

- ❖ **Epidemiology of communicable and non communicable diseases will be covered as an integral part of each course in phase 2 of the curriculum.**

<b>Title</b>	<b>Code</b>	<b>Semester/Duration</b>	<b>Credits</b>
MUSCULOSKLETAL SYSTEM	ME-MSK-223	4/5 weeks	3

This is a five-week block module, on: (1) the structural and functional details of bones, muscles, nerves and joints, (2) physiology of excitable tissues, (3) processes of muscle contraction, (4) disruption in continuity of bone and methods of restoration of bone function, (5) complications of bone fractures, (6) calcium metabolism, (7) bone infections, (8) inflammation and degeneration in joints, (9) bone and muscle tumors, (10) living and imaging anatomy of bony landmarks of musculoskeletal system, (11) examination skills of musculoskeletal system, (12) musculoskeletal pain, and (13) essential drugs used in musculoskeletal disorders, road traffic accidents and their impact on individual, family and community (outline).

<b>Title</b>	<b>Code</b>	<b>Semester/Duration</b>	<b>Credits</b>
NUTRITION AND METABOLISM	ME-NUT-224	4/4weeks	4

This is a four-week block module that helps students understand the: (1) biochemical and physiological basis of nutrition, (2) food substances and supplements including vitamins, (3) breast feeding, (4) nutritional requirements, (5) nutritional disorders in infancy and childhood including malnutrition, (6) deficiency of vitamins and certain other substances resulting in disease,(7) diagnosis and management of nutritional disorders, diabetes mellitus and hyperlipidemias, with particular reference to those occurring in the Sudan.

<b>Title</b>	<b>Code</b>	<b>Semester/Duration</b>	<b>Credits</b>
GASTROINTESTINAL SYSTEM AND ORAL HEALTH	ME-GIT-225	4/6weeks	6

This is a six-week block module, on the structural details of (1) the anatomy of anterior abdominal wall, inguinal region, scrotum, testes, abdominal cavity, gastrointestinal tract, associated organs (liver, biliary tract, pancreas, and spleen including innervation, (2) functional aspects of mastication, deglutition, digestion and absorption of food, mobility and homeostatic role of the hepatobiliary system and GI tract, (3) gastrointestinal symptoms of nausea, vomiting, diarrhea, constipation, abdominal pain, distension, etc, (4) common diseases like peptic ulcer, jaundice, infections and infestations, neoplasms and their definite or possible etiology, pathogenesis, and clinical features (5) common investigative procedures applied in GIT (e.g. stools and blood examination, ultrasonography, radiology, endoscopy ), (6) common operative procedures, and (7) essential drugs used in GIT problems.

<b>Title</b>	<b>Code</b>	<b>Semester/Duration</b>	<b>Credits</b>
INTRODUCTION TO MEDICAL ETHICS	ME-ETHIC-226	2/Longitl	2

This is a two-credit-hour course by the end of which the student should show an understanding of the (1) history of medicine, (2) the role of the Moslem scholars in the practice of medicine, research and medical ethics, (3) the milestones of medical education in the Islamic era, (4) the Fiqh of illness and the sick, the religious regulations

concerning treating the sick person, how does the sick person performs his rituals: cleanliness, prayers, fasting, pilgrimage? Also, (5) the visiting of sick person, (6) managing a death episode, (7) the religious conduct when males are managing female disease and vice versa, (8) the emerging controversies of in vitro fertilization, transplantation, brain death, cloning, genetic engineering. Students should be aware of the (9) Figh of health preservation including cleanliness, sleep, eating and drinking, the jurisprudence of toxic substances and narcotics, infectious diseases, breast feeding, consanguinity marriage, quarantine, death and funerals, dissection of human body for teaching and law, (10) medical behaviour, professional ethics, responsibility of a health professional, (11) issues in protection of acts of a health professional and (12) giving an expert witness at court. It will include the internationally-agreed upon- ethics as well as the evolution of medical ethics in pre-Christian, Christian and Islamic eras.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
URINARY SYSTEM	ME-URO-313	5/5 weeks	5

This is a five-week block module, on the structural details of (1) the anatomy of the kidney, ureters, urinary bladder and urethra, and the adjacent posterior abdominal wall and related genital organs, (2) functional aspects of the kidney in the production of urine, excretion of metabolic end products, regulation of blood pressure, body fluids osmolarity and acid base balance, (3) urinary symptoms of renal (urinary) colic, hematuria, dysuria, etc, (4) common diseases like of urinary calculi, renal failure, urine retention, neoplasms and their definite or possible etiology, pathogenesis, clinical features (5) common investigations and procedures applied in urinary tract problems (e.g. urine and blood examination, ultrasonography, radiology, cystoscopy etc. ), (6) common operative procedures, and (7) essential drugs used.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
REPRODUCTIVE SYSTEM	ME-REP-314	5/4 weeks	4

This is a four-week block module, on the structural details of (1) the anatomy of the male and female reproductive systems (including embryogenesis and fetal growth and mammary gland), and the adjacent posterior and anterior abdominal and pelvic walls, and related urinary organs, (2) functional aspects of the reproductive systems (e.g. menstrual cycle, physiology of pregnancy and lactation, puberty and age-related changes, and hypo- and hyper secretion of male and female gonads, (3) reproductive problems including infertility, bleeding in early or late pregnancy, abnormal and complicated pregnancy, normal and abnormal labor etc, (4) community aspects of reproduction, antenatal care, assisted pregnancy, family health, (5) common investigations and procedures applied in reproductive problems (e.g. urine and blood examination, ultrasonography, etc.. ), (6) common operative procedures, and (7) essential drugs used.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
ENDOCRINE SYSTEM	ME-ENDO-315	5/4 weeks	4

This 4-week bock module is concerned with endocrine glands and metabolism and their problems. It consists of objectives of basic sciences integrated with clinical sciences and skills. It covers: (1) the anatomy, histology, development and secretions of these glands, (2) their functions, diseases occurring as a result of reduced or increased production,(3) diagnostic tests and (4) management. The course includes: (5) related normal metabolic functions, (6) the abnormalities causing diseases like diabetes mellitus, (7) their diagnosis, management and prevention at individual and community levels.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
HEAD AND NECK	ME-HAN-322	6/3 weeks	2

This is a three-week-block on the: anatomy of the head and neck. The student should: (1) identify the various parts of the skull bones, particularly the cranial cavity and facial skeleton, including all sutures and foramina, indicating the structures passing through them, (2) name and locate muscles; their attachments, nerve supply and action, on the skull bones, particularly the muscles of mastication and facial expression, (3) describe the walls, fissures, foramina, notches, and name and identify its contents, particularly the extraocular muscles and nerves, (4) Identify the various parts of the eyeball, and discuss the development, structure and function of each, (5) describe the morphology and structure of the various parts of the nasal cavity and their functions, including the paranasal sinuses (6) review the anatomy and histology of the oral cavity, including the salivary glands (7) describe the triangles of the neck and their contents, particularly lymph nodes and thyroid and parathyroid glands, (8) describe the skeleton and soft tissues of the larynx, its extrinsic and intrinsic muscles and their nerve supply and actions, (9) review the parts of the pharynx, its muscles and nerve supply, and (10) the various parts of the ear and their functions.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
NERVOUS SYSTEM AND SPECIAL SENSES	ME-CNS-324	6/8 weeks	8

This is a 8-weeks course that covers the basic and clinical sciences of the nervous system including the special senses, all integrated with the necessary skills, around common problems. The content detailed in the comprehensive objectives includes: (1) structure of the nervous system and its components, (2) functions of the nervous system components and special senses, (3) common pathological deviations that affect the functions of the nervous system components and consequences of these changes, (4) underlying pathophysiological basis of common neurological and special sense disorders, (5) approach to neurological and special sense problems in a logical sequence, (6) taking appropriate history from, and conduct systematic physical examination on patients with nervous system complaints, (7) performing and requesting tests and investigations necessary in diagnosis of common disorders of the nervous system, (8) Outline clinical management plans for common neurological and special sense disorders, (9) identifying the psychological, social and economic impacts of some common neurological disorders in the community, (10) drugs used in the management of common neurological disorders and (11) rehabilitation of patients with neurological disorders, as individuals and in the community.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
TROPICAL MEDICINE & ENDEMIC DISEASES	ME-TROP-324	6/2 weeks	2

This is a two-week course meant to highlight the importance of tropical diseases in Sudan and worldwide. In Sudan a patient may have more than one tropical disease or tropical and non-tropical at the same time. This course will be studied in form of problems of common presentations of tropical diseases. By the end of this course the student should be able to diagnose, manage and take appropriate preventive measures; (1) in the relations between vectors and hosts, (2) causes of fever in the tropics, (3) malaria, (4) schistosomiasis, (5) leishmaniasis, (6) leprosy, (7) brucellosis and enteric fever, (8) amaebiasis and giardiasis, (9) meningitis, (10) trypanosomiasis, (11) onchocerciasis, (12) snake bites and scorpion stings.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
HISTORY AND PHYSICAL EXAMINATION	ME-CLIN-326	6/3 weeks	2

In spite of advances in all modalities of investigation, history taking and clinical examination are the sine-qua-non in medical practice. Failure to master both would lead to waste in investigation cost and patients suffering. The course would enable the student to show: (1) full awareness of importance of history taking and examination, (2) take a comprehensive history from the patient, relatives or others, (3) analyze the history to reach the possible diagnoses or final diagnosis, (4) perform full physical examination to limit the above possibilities and reach a short list of differential diagnoses, (5) request intelligent cost-effective investigations for final diagnosis.

Methods of teaching in this course will include the use of healthy volunteers, skill laboratory and case presentations for demonstration of clinical symptoms and signs.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
BASIC PHARMACOLOGY & THERAPEUTICS	ME-PHARM-324	6/4 weeks	4

A four-week block module during semester 6, to include: (1) definition of a drug, (2) development of a drug, (3) drug absorption and pharmacodynamics and kinetics, (4) rational use of drugs in the management of emergency and common problems, including drug prescription for common diseases: rhinitis, sinusitis, laryngitis, bronchitis, pneumonia, pulmonary TB, (5) interaction between drugs and of genes with drugs for example glucose-6 phosphate dehydrogenase deficiency and sulphonamides and antimalarials, (6) clarify interrelationship between bacterial infections, inflammatory mediators, anti-inflammatory drugs and antimicrobial drugs, (7) effects of morphine, (8) clinical uses and side effects of aspirin, paracetamol, and non-steroidal anti-inflammatory drugs, (9) outline the use and side effects of levodopa (in parkinson's disease), tricyclic antidepressants (in depression), benzodiazepines (in insomnia), antipsychotic drugs (in schizophrenia), antiepileptics (in seizures), muscarine antagonists, anticholinesterases, sympathomimetics and beta blockers, study of anti-hypertension, anti-diabetic and lipid-lowering drugs.

### Phase 3: = Semesters 7-10, Clerkships

#### General organization of the clerkships

The General Objectives of the clerkships are as follows: The students would be able to:

1. Show responsible and compassionate behaviour with the patient and family considering the cultural, social and economic background, and in dealing with all levels of education and abilities.
2. Master the required communication skills for appropriate history taking and medical examination.
3. Appreciate the role of perfect understanding of basic sciences (anatomy, physiology, and biochemistry) and the underlying pathophysiological processes relevant to medical practice in diagnosis and management of common illnesses in patient and community.
4. Be acquainted with the epidemiological profile of the population and society, their heritage and cultural, social, geographic and economic characteristics, and relationship of all those to medical (surgical, obstetrical, gynecological, pediatric) disease etiology and management.
5. Have the knowledge and skills necessary to identify and manage the health problems of a patient: emergency situations, common endemic or epidemic diseases, injuries and disabilities, including health promotion, prevention, treatment, rehabilitation and follow up.

6. Opt for the wise selection of the most appropriate and cost-effective investigations to reach the proper diagnosis, considering the patient rights and abilities and the capabilities of the health system.
7. Interact effectively with the health team (and appreciate the role of others) in providing medical services.
8. Continue independent learning and pursue postgraduate studies

### IMPORTANT :

Detailed specific objectives can be seen in the Medical Curriculum Manual. A clerkship booklet is provided to students in the first session in the clerkship. It is the students' responsibility to work towards achieving the objectives included, irrespective of the educational activities offered during the block. The objectives represent the minimum required competences for these clerkships.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
INTERNAL MEDICINE	ME-MED-411	7,8,9, or 10/ 14 weeks	12

This is a 14-week continuous block, which is interrupted by longitudinal courses for one half-day every week. During this clerkship, the student should: (1) demonstrate good attitudes, ethics and professional behaviour in the practice of internal medicine (2) obtain full history relevant to the medical problem in general practice, perform appropriate physical examination, requests informative and cost-effective investigations, analyses information to reach (or suggest differential) diagnosis, select (or suggest) proper treatment, health promotion, prevention, protection, follow up and rehabilitation, including problems seen in emergency situations, epidemic and endemic diseases, common respiratory, cardiovascular, gastrointestinal, renal, endocrine, rheumatic, and nervous system problems, (3) demonstrate knowledge of basic and clinical sciences , relevant to internal medicine and general practice, (4) recognize urgent and emergency medical conditions (see also ERM-407, (5) analyze community problems related to medical disease, and (6) describe essential drugs used in common medical problems (headache/migraine and various types of pains and colics, seizures, meningitis/encephalitis, malaria, typhoid fever, schistosomiasis, leishmaniasis, hypertension, stroke, dementia, disorders of the motor systems. coronary heart disease, congestive heart failure, arrhythmias, pneumonia, asthma, causes of dyspepsia, nephritis and renal failure, diabetes, worm infestations, vomiting diarrhoea, constipation, dehydration, nutritional deficiencies, anemias, hematological malignancy, bleeding disorders, thyroid disease, obesity, adrenal insufficiency, Cushing syndrome, osteoarthritis, rheumatoid

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
EMERGENCY MEDICINE	ME-MER-412	7,8,9 or 10/4 weeks	4

A four-week block during medical clerkship semester designed to contain common medical emergencies seen in Emergency Department, mostly undifferentiated cases, that require life-saving management including: (1) prioritization, (2) resuscitation and stabilization, (3) simultaneous management of more than one patient, (4) appropriately-focused history and physical examination, (5) working differential diagnosis (6) quick investigations, (7) courageous attitude, (8) adequate basic clinical skills, (9) organization skills and documentation habits, (10) recognition of importance of pre-hospital or onsite emergency care, (11) psychological care, ethical issues in emergency. Major emergency conditions include: (1) trauma resuscitation, (2) poisoning, (3) cardiac dysrhythmias, (4) myocardial infarction, (5) epilepsy and seizures, (6) coma, (7) status asthmaticus, (8) urine retention, and (9) acute abdomen. The essential skills are: (1) basic life support (BLS), (2) advanced cardiac life support (ACLS), (3) venepuncture, (4) intravenous lines, (5) arterial puncture, (6) local anesthetic infiltration, (7) urinary catheter insertion, (8) application of bandage, splints and casts, and (9) wound suturing.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
DERMATOLOGY	ME-DERM-413	7,8,9, or 10/2 weeks	2

A two-week block, just after or in integration with internal medicine clerkship, to include: (1) description of the histological features of the skin, and explain the causes of variations in skin colour, texture and thickness, (2) outline of the basics of dermatologic terminology, (3) basic clinical skills to diagnose and suggest management for common skin problems.(4) health promotion, and protection, prevention, treatment, rehabilitation and follow-up of skin problems..(5) structure, function and pathophysiological processes of the following skin conditions: a) acne and related disorders: acne, rosacea and perioral dermatitis, (b) eczema (endogenous and exogenous) and atopic and seborrheic dermatitis, (c) papulosquamous diseases: psoriasis, lichen planus, pityriasis rosea, (d) pigmentary disorders: vitiligo, melasma, (e) common skin infections: fruncle, carbuncle, impetigo, cellulites, dermatophytosis, candidiasis, viral wart, herpetic infections, molluscum, scabies, leishmaniasis, (f) bullous diseases: pemphigus, bullous pemphigoid, dermatitis herpetiformis, (g) connective tissue diseases: lupus, dermatomyositis, scleroderma, (h) drug reactions, (i) common skin infections, eg. Chickenpox, herpes zoster, measles, German measles etc..., (j) skin cancer eg. Basal and epithelial cell carcinomas.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
GENERAL SURGERY (incl. anesthesia)	ME-SURG-421	7,8,9 or 10/12 weeks	12

A twelve-week continuous block, interrupted only by longitudinal courses for one half-day every week, to include: (1) demonstrating good attitudes, ethics and professional behaviour in the practice of surgery (2) obtains full history relevant to the surgical problem, perform appropriate physical examination, requests informative and cost-effective investigations, analyzes information to reach (or suggest differential) diagnosis, select (or suggest) proper treatment, health promotion, prevention, protection, follow up and rehabilitation, including problems seen in emergency situations, (3) demonstrating knowledge of basic and clinical sciences, particularly anatomy, pathology, microbiology and basic skills, relevant to surgery, (4) recognize urgent and emergency surgical conditions, e.g. burns, acute abdomen, head injury, (see also MER-412, (5) diagnose and manage goitre and thyroid disorders, acute abdomen, breast lump, inguino-scrotal swellings, lymphadenopathy, hematemesis, biliary and liver surgical conditions, peptic ulcer disease, anorectal disorders, urinary stones and masses, chest trauma, (6) outline diagnostic procedures and management of cardiac surgical problems, brain tumors, abdominal masses, (7) anesthetics for preoperative and during operation, (8) postoperative management, (9) basic operative skills, and (10) essential drugs used in general surgery.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
ORTHOPEDIC SURGERY	ME-ORTOP-422	7,8,9 or 10/4 weeks	4

A four-week block, just after or in integration with the general surgery clerkship to include: (1) reviewing the gross anatomic features of the musculoskeletal system, bone development, identification of bony parts in x-rays, bone metabolism, and pathophysiological bases of common orthopedic problems, (2) taking adequate history of trauma and chronic orthopedic problems, performing proper physical examination, and request the appropriate and cost-effective investigations, (3) management of emergency and trauma in orthopedics (multiple injuries after road traffic accidents and other accidents, (4)principles of fracture management, (5) management of common and serious fractures, shoulder dislocation, pyogenic and chronic bone and joint infections, osteoarthritis, (6) diagnosis and outline of subsequent steps in the management of back pain and spinal injuries, (7) outline

mechanical hip, knee and other joint disorders, a limping child, peripheral nerve injuries, congenital dislocation of hip, (8) identification of lytic or sclerotic bone lesions in an x-ray, (9) essential drugs used in orthopedic problems, (10) rehabilitation after orthopedic disease or fracture, and (11) neoplastic bone lesions.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
OPHTHALMOLOGY	ME-OPTAL-423	7,8,9 or 10/2 weeks	2

A two-week block, just after or in integration with the general surgery clerkship to include: (1) taking history, performing physical examination, carry out the visual acuity and refraction tests, and request the necessary investigation, (2) recognize the critical role of the primary care physician in preventing visual loss through prompt and appropriate treatment and timely referral, (3) manage ocular emergencies and trauma, (4) recognize, diagnose and outline subsequent steps in management of the common ocular conditions: red eye, impaired vision, painful eye, cataract, glaucoma, exophthalmos, retinopathy or eye manifestations of systemic disease, abnormal ocular mobility, (5) the use of the ophthalmoscope, and (6) essential drugs used in ophthalmology.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
EAR, NOSE AND THROAT	ME-ENT-424	7,8,9 or 10/2 weeks	2

A two-week block, just after or in integration with the general surgery clerkship semester, addressing clinical activities in the ENT department, such as: (1) taking history and performing examination on ENT patients, (2) using knowledge of basic sciences, pathophysiological processes to explain disorders, (3) use clinical sciences and skills, and investigations to reach differential diagnosis, and (4) recommend or observe management done by senior members of the ENT health team. Details of disorders include: (1) common cold, (2) sinusitis, (3) tonsillitis, (4) laryngitis, (5) otitis media, and (6) neoplasia, (7) recognize the various causes of hearing loss, and (8) carry out proper timely referral to specialist. The skills include: (a) examination of the mouth, (b) use of auroscope and laryngoscope in examination of the ear and larynx, and (c) recognize an audiologic machine and interpret results.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
RADIOLOGY AND IMAGING	ME-RAD-414	10/2	2

A two-week block in semester 10 or a longitudinal course during Semesters 7 and 8, to include: (1) the modalities and techniques used in imaging and outline of the basic physics underlying image production and quality control, (2) identification of the normal anatomic structures in routine radiographs of the chest, plain abdomen, pelvis, skull and various segments of the limbs, as well as identifiable structures seen in CT and MR cuts of the normal brain and mediastinum, (3) the techniques used in routine plain and contrast radiography of the various parts and systems of the body related to common and/or serious problems, (4) identification of the reliable diagnostic radiological signs seen in common respiratory problems (pneumonia, emphysema, bronchiectasis, pleural effusion, pneumothorax, ca bronchus), and in life-threatening emergency situations such as chest pain, acute abdominal pain, trauma/fractures, syncope/coma, bleeding, etc., and (5) essential drugs and material used in radio-diagnosis and patient care while in the imaging department.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
MEDICAL PROFESSIONALISM	ME-PROF- 415	10/ longitudinal	2

The medical profession deals with people in every minute possible aspect of their lives. Accordingly, the society expects medical doctors to provide a constant supply of the best care regardless of the possible difficulties. This block introduces the students to: (1) the concept of medical professionalism including medical ethics,



communication skills and health advocacy.(2)values and attitudes expected from medical professionals.(3) the expected role of the doctor within the community.(4)The basics of doctor-patient relationship.(5) The effect of religion, culture and educational level on doctor-patient relation.(5)the relation between law and medicine.(6) addressing critical situations: breaking bad news, medical errors, conflict resolution and counseling.(7) and communication between health professionals.

In these two weeks the student should show full understanding of the above and commitment to it.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
OBSTETRICS AND GYNECOLOGY	ME-OBGYN- 511	7,8,9 or 10/12 weeks	12

During the 12-week clerkship, the student would (1) demonstrate good attitudes, ethics and professional behaviour in the practice of obstetrics and gynecology (2) obtain full history relevant to obstetrics and gynecology practice, perform appropriate physical examination, requests informative and cost-effective investigations, analyze information to reach (or suggest differential diagnosis, select (or suggest) proper treatment, health promotion, prevention, protection, follow up and rehabilitation, including problems seen in antenatal care, contraception, infertility, bleeding in early or late pregnancy, pregnancy complicated with systemic disease, high risk pregnancy, disorders of menstrual cycle, (3) demonstrate knowledge of basic and clinical sciences , relevant to obstetrics and gynecology, (4) recognize urgent and emergency conditions in obstetrics and gynecology (5) analyze community problems related to women health, (6)attend and discuss the progress of labor and monitoring, (7) discuss genital infections and tumors of the genital system eg. ovaries, uterus etc., and (8) identify and discuss essential drugs used in obstetrics and gynecology problems.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
PSYCHIATRY	ME-SYC-512	7,8,9 or 10/4 weeks	4

A four-week block, anytime during semester 9, preferably after ME-MED 411 and/or ME-SURG 421, to include: (1) demonstrating professional ethics and attitudes appropriate for psychiatric practice, (2) establishing a rapport with a variety of patients and families, and taking comprehensive history of a patient problem in an empathic environment, being aware of patients emotional responses and family concerns on raising certain in-appropriate questions, (3) conducting physical examination of whole body and mental status including, cognitive testing and assessment of suicidal or homicidal risks, ( 4) requesting suitable, and cost-effective investigations, (5) being aware of the various relevant biological, psychological and social factors related to the etiology and management and rehabilitation of a psychiatric patient, (6) managing psychiatric emergencies (e.g. hostile or aggressive patient), depression, schizophrenia (7) recognizing, diagnosing (or outline necessary steps in diagnosis and management of) mood disorders (e.g. mania), anxiety (e.g. panic, obsessive-compulsive, phobias), personality disorders, cognitive impairment and substance (chemical. alcohol, drug) abuse, (8) disorders like, dementia, delirium, psychoses, human sexuality problems, (9) essential drugs used in psychiatric practice.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
FAMILY MEDICINE	ME-FAM-513	7,8,9 or 10/3 weeks	3

This three-week block, can be implemented longitudinally, if need be. Ideally the student should be attached to a known family in the vicinity of the college early on in the curriculum (semesters 4-6), the last four week consolidate his/her activity during the attachment. Alternatively the following components should be covered:

basic interviewing, communication skills and examination skills, genetic counseling, nutritional counseling, approach to management of headache, backache, dyspepsia, a febrile child, vaccination, bronchial asthma, hypertension, diabetes mellitus, sore throat, iron deficiency anemia, irritable bowel syndrome, intestinal worms, otitis media, depression, anxiety and other psychiatric problems, obesity, smoking habit, snuff taking, alcoholism, drug addiction, ischemic heart disease, arthritis.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
PAEDIATRICS	ME-PED-521	7,8,9 or 10/11 weeks	11

A 11-week continuous block, some of the contents are also relevant to ME0FAM-509, to include: (1) professional ethics and attitudes appropriate for pediatric practice, (2) review of the developmental anatomy and disorders encountered at birth and following childhood years, (3) taking a comprehensive pediatric history from child/ adolescent or their immediate care giver, perform and record proper physical examinations, and select the most appropriate and cost effective investigations relevant to the child problem, (4) recognition and management of emergency pediatric conditions (convulsions, fever, dehydration, respiratory distress, etc.), common neonatal problems, child nutritional problems, (5) recognizing, diagnosing (or carry necessary steps in diagnosis), and outline subsequent steps in the management of nephritic syndrome, nephritis, renal failure, obstructive uropathy, type 1 diabetes mellitus and other endocrine disorders in childhood, congenital and acquired heart disease, childhood malignancies (6) analyzing community problems related to child health, immunization and disorders of immunity, (7) accidental and suicidal poisoning in children and (8) essential drugs used in pediatric practice.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
FORENSIC MEDICINE AND LAW	ME-LAW-522	7,8,9 or 10/2weeks	2

A two-hour every two weeks during Semesters 9 and 10, or a two-week block, to include: (1) recognition of death and identify age and race of a dead person, and identification of cause of death ( gunshot, physical agents, electric contact, burns, asphyxia, drowning etc) (2) description of postmortem changes, and determination of the time of death, (3) examination of specimens and stains (caused by) blood, semen, milk, excreta etc, (4) definition and classification of wounds from the medico-legal aspects, (5) recognition of types of head injuries and factors affecting them, (6) identification of firearms and firearm injuries, (5) recognition of injuries due to physical agents, (7) recognition of sexual assaults on both sexes, rape and consequences of abortion and miscarriages, (8) identification common types of toxins, poisons and poisoning, and determination of the environmental and criminal causes of common poisoning incidents, (9) giving witness in a court, (10) writing a death certificate, (11) taking proper history from attendants, performing physical examination and requesting appropriate investigations to reach the cause of death.

<i>Title</i>	<i>Code</i>	<i>Semester/Duration</i>	<i>Credits</i>
Health economics and hospital management	ME-HM-523	10/2weeks	2

A two-week block introducing students to: (1) the definition and scope of the terms "health economics", "health value", " market equilibrium", (2) the economic factors which influence health, (3) demand for and supply of health care, (4) planning, budgeting and monitoring mechanisms, (5) assurance that informatics solutions in healthcare meet patient's privacy, confidentiality, and security requirement, (6) health informatics as a decision support in management, (7) leadership- doctors as leaders or managers, (8) Sudanese health system, (9) legal responsibilities for health care management, (10) documentation, (11) communication, (12) evidence-based practice, (13) sources of conflict and conflict resolution at work.