The Republic Of South Sudan

A National Medical Curriculum

For The Award of the Degree of Bachelor of Medicine and Bachelor of Surgery (MBBS)

Forward

As a nation, South Sudan has made some progress towards improving higher education since independence in 2011. However, despite this progress the country still has remarkable gaps in terms of skilled human resources in various institutions, specially the services providing domains like healthcare. In this institution we lack quantity and quality in the major health professional categories (doctors, pharmacists, Dentists, nurses and paramedical technicians).Studies conducted with support from our developmental partners, quote in estimate the density of the health professional workforce to be 8% of the recommended threshold ,as our figures indicate 3.5 workers per 10000 of population compared to the established global strategy on human resources for health that recommends 44.5 per 10,000 as a threshold to reach and achieve a desirable functional national healthcare service which complies with the attainment of the sustainable development goals(SDGs) by 2030.

To reach the threshold of a functional health professional workforce as a nation, we must step up robust training programmes of these technical human resources. These training programmes are best conducted using evidence-based regularly appraised curricula. The national unified medical education curriculum developed by the three national Universities of Juba, Bahr El Ghazal and Upper Nile is an important milestone towards improving medical education in our Country.

Today unlike decades ago, we know what works well nationally and regionally as we have checked evidence-based best practices in the field of health professional and medical education in order to produce competent healthcare workforce. We noted with satisfaction that, the unified curriculum for medical education developed by the three national universities places a significant emphasis on a competency-based medical education.

As The National Ministry of Higher Education, we will go out of our way to recognise, commit resources and stewardship needed for the implementation of this national training curriculum as a model for health professional training of medical doctors. Furthermore, for a better training strategy we will also partner with other relevant government's ministries and departments including but not limited to those responsible for human resources development and public service like, The Ministry of Public Service and General education.

Hon. Gabriel Changson Chang
Minister of Higher Education, Science and Technology
Republic of South Sudan

Acknowledgement

The harmonized national medical curriculum was developed through a highly consultative process involving the three universities of Juba, Bahr El Ghazal and Upper Nile and individual experts in higher education. The Ministry of Higher Education profoundly appreciates the support of the World Health Organization which provided the technical and financial support during the development of this curriculum. More specifically the Ministry acknowledges schools of Medicine in the three public universities and many academics involved from different fields.
The entire process for the development of this national model curriculum was hosted by the University of Juba under the able leadership of Prof. John A. Akec, Vice Chancellor, University of Juba and the School of Medicine. From the University of Bahr El Ghazal, The Vice Chancellor, Prof. Victor Laku gave a tremendous leadership support to the whole process. The Ministry appreciates the role of the international consultant, Prof. Midion Chizondga, who provided technical assistance in writing the initial drafts of the curriculum. The Ministry would like to thank the following for their contribution towards completion and finalization of this national curriculum development project:

University of Juba:
Dr. Rose Ajak Costa Mapuor, Dr. Kenneth Lado, Prof. Mayen Achiek, Dr. Richard Wani, Dr. Ajak Makor Dhel and Ustaz Angelo Ajuong Aluong
University of Bahr El Ghazal:
Prof Hawa Abdallah, Dr Thomas Madit
Upper Nile University: Prof. Yohanes Edward, Prof. Peter Adwok, Dr. Simon Deng Nichar and Dr. Chol Obuonyo
WHO: Dr. Moses Ongom and Dr Robert Bagi

Field visits to the universities helped in contextualising of the information obtained from reviews of the current curricula and documents on human resources for health. Thanks to all the individuals not mentioned and who in one way or another participated in the development of this curriculum, you made your contribution in improving medical education in South Sudan.

The Ministry of Higher Education will ensure dissemination and full implementation of this national curriculum in a co-ordinated and collaborative manner.

Dr. Adil Athanaziou Suror,
Undersecretary,
Ministry of Higher Education, Science and Technology
Republic of South Sudan

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1. Background

After more than two decades of war, South Sudan signed the Comprehensive Peace Agreement in 2005 and attained her independence in 2011. The country has a population of 12.3 million which is growing at a rate of 3% (national Bureau of Statistics, South Sudan (2008): South Sudan Population Census) and life expectancy of 52 years.

The country continues to face pockets of protracted conflicts since December 2013, and by July 2016 the crises had affected over 7 million people accounting for over 2 million refugees in the neighbouring countries and 1.9 million internally displaced persons (IDPs) with associated multiple outbreaks of communicable diseases and famine (UNOCHA (2017:Republic of South Sudan Humanitarian Update).The health system has also remained fragile, and service delivery continues to face enormous challenges due to lack of qualified staff, weak supervision and coordination, and low uptake/implementation of essential lifesaving and high impact interventions (basic health and nutrition services) within the context of an ongoing conflict. Republic of South Sudan has some of the worst health and nutritional indicators in the world. The Maternal Mortality Ratio is 789/100000 live births, Infant Mortality Rate of 79/1000 live births and child mortality rate of 105/1000 as of 2015. In order to address the shortages of the health workforce there is a need to improve the training capacity of the national training institutions.

2. Rationale

Despite the enormous investments made in the health sector over the past years, investments in the production of human resources for health has been limited to a small category of mid-level cadres and overseas training of few doctors and specialists which is more expensive with a number of them failing to come back and serve the country. Other cost-effective interventions, such as improving the quality of the national medical educational institutions, were not explored. Thus, South Sudan still has significant gaps in the quantity, quality and distribution of significant categories of health workers: specialist doctors, general family doctors (medical officers), medical laboratory technologists, nurses, clinical officers, midwives, pharmacists, dental personnel, and other much needed healthcare workforce. The core health workforce density is estimated to be 3.5 health workers per 10,000 (nurses and doctors). The staffing in health facilities within the county health system based on the basic package of health and nutrition services is at 10 -20% against the staffing norms for facilities. With these figures coupled with poor skills mix and maldistribution, South Sudan is unlikely to meet any target for Universal Health Coverage (UHC) and the Sustainable Development Goals (SDGs). Part of the efforts to improve the quality and quantity of medical doctors is to revamp their training programmes through developing training curricula that are aligned to the health needs of South Sudan and also with the developments in medical education regionally and internationally.

The Situation of Medical Schools in the Republic of South Sudan

The Republic of South Sudan has three Colleges of Medicine, one in each of the three National Universities of Juba, Upper Nile and Western Bahr El Ghazal. The oldest university is the University of Juba which was established in 1975 in Juba. However, due to the protracted conflict, The University of Juba was relocated to Khartoum where it operated for more than 20 years. The Universities of Upper Nile and Bahr el Ghazal were established in Khartoum in 1993. At independence, all the universities relocated to the newly formed Republic of South Sudan, a process that was marred by a huge loss of valuable assets including human resources, educational equipment and materials.
The curricula of the Colleges of Medicine are now outdated. Information obtained from The University of Juba suggests that their curriculum was last reviewed in 2006. It is not clear when last the other two

Colleges of Medicine reviewed their curricula. The undergraduate medical degree program in the three universities is a six-year programme intended to develop the six educational competencies central to the practice of medicine.

Evaluation is critical to inform efforts in improving curricula that prepare graduates to address the social determinants of health, health promotion, and disease prevention, primary health care, secondary and tertiary clinical care. A well designed curriculum offers a people- centred integrated community-based training that accommodates changes and innovations in medical education and practice.

It is with this in mind that a formal evaluation of the medical education training curricula of the three Medical Schools in the Republic of South Sudan was undertaken with the goal of developing a harmonised, integrated, system-based, patient-centred, and community-centred and competency-based medical education/training curriculum for the three schools.

3. Vision

To be internationally accredited medical training institutions with an innovative excellent medical education using evidence-based ,technology driven teaching and learning approach with a strong bias towards improving health care delivery in the country.

4. Mission Statement

To train highly competent and reflective medical practitioners who are capable of delivering high quality care through their contextualised competency-based curriculum benchmarked against regional and international training standards.

5. Core Values

a. Belief in Universal Health Coverage and Primary Healthcare service Delivery for all
b. Innovation in medical education
c. International Accreditation for Quality Assurance
d. people-centred training
e. Research intensive medical education
f. Evidence-based training and practice
g. Ethics, Honesty, Integrity and Respect for human rights

6.0. Competency-based Medical education curriculum (CBME)

The CBME curriculum focuses more on competency. In the healthcare context, “Competency is the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and the community being served”. (Epstein and Hundred, 2002).

Albanese et al. (2008) defines five characteristics to define competency:

1. A competency focuses on the performance of the end-product or goal-state of instruction.
2. A competency reflects expectations that are external to the immediate instructional programme.
3. A competency is expressible in terms of measurable behaviour.
4. A competency uses a standard for judging competence that is not dependent upon the performance of other learners.

5. A competency informs learners, as well as other stakeholders, about what is expected of them.

Implementing CBME curriculum programme

1. Define health needs of the community
2. Needs definition of competencies
3. Self-regulated and flexible learning options
4. Assessment of learners

6.1. Curriculum Model

Currently the medical education curricula being used by the Medical Colleges in the Republic of South Sudan do not comply majorly with the modern competency-based medical education curriculum being used in many countries globally. This curriculum, as such, is formulated based on the modern curricula designs in the literature and benchmarked on other CBME curricula in the region and internationally (references at the end of this document).

Competency-Based Medical Education Curriculum (CBME)

Is a curriculum that is designed to deliver Competency- Based Medical Education (CBME). This curriculum explicitly focuses on the desired performance characteristics of health care professionals, in this case medical practitioners. The traditional curriculum has always implicitly shared this same goal. The CBME explicitly addresses this goal by establishing observable and measurable metrics that learners are expected to accomplish by the ability to perform established expectations as a criterion for being deemed a competent professional (Gruppen et al.).

The traditional curriculum has been leaning more on learning than acquisition of competencies.

The new Republic of South Sudan MBBS curriculum is a hybrid model promoting the following curriculum aspects:

1. Horizontal and vertical integration
2. Thematic/systems- based teaching and learning
3. Small group teaching and learning methods
4. Student-centred, problem-based, integrated, community-based, electives and systematic teaching and learning (SPICES model).
5. Student-directed Learning, self-directed learning
6. Optimum use of IT learning technologies
7. Primary health care models
8. Health promotion and health education approaches
9. Distributed community education
10. Leadership, governance and Health systems management
11. Inter-professional education and inter-professional collaborative practice
12. Spiral curriculum approach

6.2. Programme Goal

The harmonised, integrated, systems-based, patient-centred, community-centred and competency-based medical education curriculum is crafted to impart knowledge, attitudes and skills (abilities) to produce a competent and reflective medical practitioner defined by what he/she is able to do (doing the right thing by applying technical intelligence); how she or he approaches her/his practice (by doing the thing right by applying intellectual, emotional, analytical and creative intelligences); she/he performs as a professional (the right person doing it by applying personal intelligences), (Harden et al., 1999). This is achieved by equipping the graduates with the following core competences: medical expert, scholar/researcher, educator, communicator/relationship builder, ethical professional, community health advocate, manager and leader.

6.3. Programme Objectives

The curriculum objective is that at the end of their learning/training the student will have acquired competencies under the following competency domains:

A. Medical Expert/ Medical Knowledge:

Medical knowledge, clinical skills, critical thinking, and critical reasoning, understanding of normal human structure and function, pathophysiology of diseases, patient presentation, differential diagnosis, patient management, surgical principles, health promotion and health education, disease causation, social determinants of health and disease prevention. Must demonstrate core knowledge and application of biomedical, behavioural, and medical sciences in patient care during medical practice and in the community. The trainee should demonstrate critical thinking in clinical situations. Must apply lifelong learning skills to be kept abreast with new developments in medicine.

Competencies

1. Establish and maintain knowledge necessary for preventive care, diagnosis, treatment, and management of common and life-threatening medical problems.
2. Perform a complete and appropriate assessment/consultation of a patient
3. Use preventive and therapeutic interventions effectively
4. Demonstrate proficient and appropriate use of diagnostic and therapeutic procedural skills relevant to generalist practice
5. Seek appropriate consultation from other healthcare providers, recognising the limits of one's expertise

Enabling competencies as demonstrated by:

i) Patient care

1. Obtain and record a detailed medical history.
2. Evaluate symptoms and signs of clinical conditions
3. Carry out a full physical and mental-state examination and interpret the results
4. Order appropriate investigations demonstrating an understanding of possible differential diagnoses
5. Interpret results of the investigations
6. Offer a provisional diagnosis and differential diagnoses
7. Develop a treatment and management plan
8. Provide feedback and the plan of care with full participation of the patient.
9. Develop an individualised discharge plan
10. Demonstrate understanding of: epidemiology, aetiology, risk factors, of clinical conditions.
11. Deliver appropriate care to patients with full understanding of their clinical conditions
12. Demonstrate knowledge of the pharmacology of the medications prescribed: indications, contraindications, side effects, drug interactions and possible alternative treatments.
13. Identify the appropriate point of care for the presenting conditions
14. Ability to distinguish between urgent and emergency conditions and refer or admit.
15. Select appropriate prevention interventions
16. Ability to care for patients with acute and chronic conditions.
17. Demonstrate lifelong learning skills by keeping abreast with new developments in medicine by offering patients quality evidence-based up-to- date care.
18. Establish and maintain current knowledge needed for preventive care, diagnosis, treatment, and management of common and life-threatening medical conditions.
19. Effectively use appropriate preventive and therapeutic interventions in the community and hospital setting
20. Demonstrate at the level of a student/generalist, performance/acquisition and use of common diagnostic and therapeutic procedural skills such as the following, but not limited to these):

1. Measuring body temperature, pulse rate and blood pressure.
2. Monitoring transcutaneous oxygen saturation.
3. Venepuncture
4. Managing blood, urine, stools and any other samples correctly.
5. Taking blood cultures
6. Managing an electrocardiograph (ECG) monitor.
7. Performing and interpreting a 12-lead ECG.
8. Basic respiratory function tests.
9. Urine Multi-dipstick Test
10. Taking nose, throat and skin swabs
11. Pregnancy testing.
12. Administering oxygen.
13. Establishing peripheral intravenous access and setting up an infusion: use of infusion devices.
14. Making up drugs for parenteral administration
15. Dosage and administration of insulin and use of sliding scales
16. Subcutaneous and intramuscular injections
17. Blood transfusion
18. Male and female urinary catherisation
19. Use of local anaesthetics
20. Skin suturing
21. Wound care and basic wound dressing
22. Applying splints and traction correctly
23. Delivery in a spontaneous vaginal delivery
24. Making and suturing an episiotomy
25. Lumbar puncture

ii) Communication

1. Clear communication with patients, their relatives, other healthcare professionals and Colleagues
2. Communicate effectively: as patient counsellor, patient advocate or educator.
3. Communicate effectively: as patient counsellor, patient advocate or educator.

iii) Provide Immediate Care in Medical Emergencies

1. Evaluate clinical conditions as urgent or emergency.
2. Provide basic first aid.
3. Provide advanced cardiac/respiratory life support.
4. Diagnose and manage acute medical conditions.

iv) Prescribe drugs safely, effectively, and economically

1. Plan appropriate drug therapy appropriately
2. Issue a safe and legal prescription.
3. Provide patients with full information about their medicines.
4. Detect and report adverse drug reactions.

V) Use information effectively, including use of technology

1. Keep accurate, legible and complete clinical records.
2. Access information sources and use the information for patient care, health promotion and education

vi) Application of basic sciences in medical practice

vii) Biomedical Sciences, Behavioural & Sociology, and Scientific Principles in the medical biology, genetics, immunology, microbiology, nutrition, pathology, pharmacology and physiology.

Being able to:

1. Explain normal human structure and function.
2. Explain the scientific bases of the signs, and symptoms of common diseases and their treatment
3. Explain and justify the scientific bases of the common investigations for diseases and conditions.
4. Demonstrate knowledge of drugs, drug actions, side effects, and drug interactions.

viii) Behavioural Sciences and Sociology (Health Social Science) principles in medical practice:

1. Explain normal human behaviour.
2. Discuss and appreciate psychological and social concepts of health, illness and disease.
3. Explain the varied responses of individuals, groups and societies to disease using theoretical frameworks of psychology and sociology
4. Explain the roles of psychological and social factors in the disease process and treatment outcome
5. Cultural diversity and health, beliefs and religion.

Medical experts will be from the following department(s):

Human Anatomy, Medical Physiology, Medical Biochemistry and Molecular biology, Behavioural Sciences, Internal Medicine, Surgery, Ophthalmology, Paediatrics and Child Health, Obstetrics and Gynaecology, Psychiatry, Pathology, Clinical Pharmacology, Community Medicine, Medical Microbiology and Immunology, Radiology and Medical Imaging, Anaesthesiology and Critical Care Medicine, and Health Professions Education.

Assessment Methods: Continuous assessment, assignments, group work, attendances at seminars, supervisor reports, peer reports, class tests, mock exams

Written examinations:

MCQs, Essays, Short answer questions, slide and data interpretation, quizzes, group reports

Clinical Examinations:

OSCEs, Long and Short Clinical Cases, Vivas, Log Books, Case Studies, Portfolios, Continuous assessment

Laboratory Practical.

B. Interpersonal and Communication Skills (Communicator Relationship Builders):

Interpersonal and Communication skills involve verbal, nonverbal (body, eye) and written exchange of information. Healthcare practitioners must demonstrate effective information transmission with colleagues, patients and their families, and the community.

i) Competencies

1. Communicate effectively through verbal, written and other non-verbal means of communication
2. Establish professional relationships with patients, their families (when appropriate) and the community that are characterised by understanding, trust, respect, empathy and confidentiality
3. Gather information, negotiate a common agenda, and develop and interpret a treatment plan, while considering the influence of factors such as ethnicity, cultural and spiritual values, socioeconomic background, medical conditions, and communication challenges.
4. Demonstrate cooperation and communication among healthcare professionals so as to maximise the benefits to patient care and outcomes, and minimize the risk of errors.

5. Demonstrate effective, clear interpersonal communication skills.
6. Create and maintain compassionate and ethical relationship with patients.
7. Appropriately adapt communication style and messages appropriate to the context of the individual patient interaction.
8. Collaborate effectively with colleagues and other healthcare professionals as a team member.
9. Demonstrate leadership where appropriate.
10. Understand and be sensitive to human behaviour and cultural diversity.
11. Demonstrate, under difficult conditions: flexibility, adaptability, tolerance and emotional stability.
12. Respect the diversity of roles in the healthcare team.
13. Document accurately information regarding patient care processes for medico-legal, financial purposes, confidentiality, quality control and follow-up purposes.
14. Respect patient confidentiality, privacy and autonomy, listen effectively, and be aware of and responsive to non-verbal cues.
15. Demonstrate cooperation and communication among health professionals so as to maximize quality healthcare delivery.

ii) Enabling competencies as demonstrated by:

1. Maintain clear, accurate and appropriate medical records
2. Accurately and efficiently present verbal reports of clinical encounters
3. Respect patient confidentiality, privacy and autonomy
4. Listen effectively
5. Be aware of and responsive to nonverbal cues
6. Gather information about a disease, but also the patient and their beliefs, concerns, expectations and illness experience.
7. Seek out and synthesise relevant information from other sources such as family, care
8. Givers, other professionals and medical records.
9. Deliver information to a patient, family, colleagues and other healthcare professionals in such a way that it is understandable and encourage patient participation in the decision-making process.
10. Effectively address challenging communication issues such as delivering bad news, discussing medical errors, and addressing patient or family anger, confusion and misunderstanding.
11. Describe the roles and responsibilities of other health professionals.
12. Respect the diversity roles, responsibilities and competences of other professionals relevant to your own.
13 Collaboratively work with other health professionals to assess, plan, provide and integrate care for patients, families and communities
14. Where appropriate demonstrate leadership in a healthcare team.

Medical experts will be from department(s) of:
Community Medicine and all other departments regarding professional communication.

Assessment Methods: Continuous assessment, Case reports, Group presentation, Self-reports and Portfolios

C. Ethical Professional/Professionalism

I) Competencies

1. Recognise and accept the need for self-care and personal development as necessary to fulfilling one's professional obligations and leadership role.
2. Demonstrate a commitment to their patients, profession and society through ethical practice as guided by the Medical Council codes of professional conduct, University code of conduct and the relevant professional and legal regulatory requirements concerning medical practice
3. Role modelling

II) Enabling competencies as demonstrated by:

1. Recognise and accept the limitations in his/her knowledge and clinical skills
2. Demonstrate a commitment to continually improve her/his knowledge, ability, skills and leadership always striving for excellence
3. Balance personal and professional priorities to ensure personal health and sustainable practice
4. Demonstrate a sound grasp of the theories and principles governing ethical decision making, the major ethical dilemmas in medicine, and an approach to resolving these
5. Demonstrate altruism, honesty, commitment, compassion, integrity and respect in all interaction with patients, families, communities, colleagues, and others with whom physicians must interact inn their professional lives
6. Demonstrate a commitment to delivering and maintaining high quality care and personal competence
7. Recognise and appropriately respond to ethical issues encountered in practice including conflicts of interest, confidentiality, and appropriate relations with patients and families
8. Develop the capacity to recognise common medical errors, report them to the required bodies, and discuss them appropriately with patients
9. Be reliable and responsible in fulfilling clinical, regulatory, and legal obligations,
10. Abide by all regulations and codes of conduct
11. Explain the principles of law as they apply to the practice of medicine
12. Recognise and appropriately respond to others' unprofessional behaviours
13. Professionalism relates to the expression of positive values and ideals during the delivery care.
    i) Altruistic
    ii) Acknowledges one's professional and personal limitations.
    iii) Desist from practicing under impairment from substance abuse, cognitive deficiency or mental illness.
    iv. Demonstrate ethical practice, accountability, responsibility, sensitivity to a diverse patient population
    v) Adherence to legal and regulatory requirements.

III) Enabling competencies (as demonstrated by)

Demonstrating:

1. Understanding the role of a doctor
2. Understanding of and abiding by the legal and regulatory requirements governing medical practice and local and international codes related to medical practice
3. Maintain professional relationships with colleagues and other healthcare providers.
4. Show respect to all irrespective of age, socio-economic status, political affiliation, race, religion or creed, compassion, and high integrity.
5. Responsive to the needs of patients and society without discrimination

6. Accountability and responsibility to the profession, patients, and the society.
7. Committed to excellence and continuing professional development.
8. Committed to ethical principles pertaining to provision /withholding of clinical care, confidentiality of patient information, informed consent, and business practices.
9. Valuing continuing professional development
10. Sensitivity and responsiveness to patients' culture, age, gender and disabilities.
11. Self-reflection, critical curiosity and initiative.
12. Recognize and accept the need for self-care and personal development
13. Fulfil one's professional obligations and leadership roles.
14. Demonstrate commitment to ethical practice to patients, profession and society
15. Abide by the University codes of professional conduct
16. Exercise self-reflection, critical curiosity and initiative
17. Understand the health system in South Sudan

Medical experts will be from all departments to participate in teaching and demonstrating by role modeling.

Assessment Methods: Observation, Supervisor reports, Portfolios, Self-report and Peer reports.

D. Community Health Advocate

i) Competencies

1. Identify determinants of health for communities and populations
2. Promote the health of communities and populations

ii) Enabling competencies as demonstrated by:

1. Describe a community including the population its demography, cultural and socioeconomic constitution, circumstances of living, health status
2. Identify determinants of health within this community
3. Describe the opportunities for health advocacy, promotion and disease prevention within this community
4. Describe how public policy impacts the health of the populations and communities
5. Apply Population Health in medical practice:
6. Discuss population health principles related to determinants of health, health inequalities, health risks and surveillance.
7. Discuss the principles underlying the development of health and health service delivery policy, including issues related to health financing, and clinical guidelines.
8. Evaluate and apply basic principles of prevention and control, at community and hospital level, of communicable (infectious) and non-communicable diseases.
9. Discuss and apply the principles of primary, secondary, and tertiary prevention of disease.

Medical experts will be from department of Community Medicine.

Assessment Methods: Field attachment, reports, Supervisors and tutors reports/observations and Portfolio.

E. Educator

I) Competencies

1. Assist in teaching peers, patients, staff and others ad facilitate learning where appropriate
2. Continuing professional development
3. Life-long learner
4. Effective mentor, supervisor, teacher, counsellor

II) Enabling Competencies (as demonstrated by):

1. Describe principles of teaching and learning relevant to medical education
2. Collaboratively identify the learning needs and desired learning outcomes of others
3. Select effective strategies and content to facilitate learning
4. Provide effective feedback
5. Demonstrate and effective teaching encounter with a patient, peer or others
6. Assess and reflect on a teaching encounter
7. Recognise the importance of serving as an advisor, coach, mentor, or teacher to less experienced members of the healthcare team.

Medical experts will be from all departments and Health Professions Education

Assessment Methods: MCQs, Peer reports, Supervisor, reports, Self-assessment and Portfolio

F. Manager and Leader professional community.

i) Competencies

1. Participate effectively in healthcare institutions, ranging from individual clinical practices to teaching hospitals, exerting a positive influence on clinical practice and policy making in one's profession.
2. Managing health institutions, human resources, administration, finances, day to day running of the institution
3. Describe the governance, structure, financing, and operation of the healthcare system and its facilities and how this influences patient care, research and educational activities at s local, regional, and national level
4. Describe the rationale for and appropriately use wise stewardship of available resources.

ii) Enabling competencies (as demonstrated by):

1. Describe the structure and function of the healthcare system
2. Describe principles of healthcare financing including healthcare workers remuneration, budgeting and organisational funding
3. Recognise the importance of just allocation of healthcare delivery resources, balancing effectiveness, efficiency, and access to optimise patient care
4. Respect differences, misunderstandings and limitations in others
5. Employ collaborative negotiations to resolve conflicts
6. Reflect on and work to improve inter-professional collaborative team function

Medical experts will be from department (s) or courses where taught:

Community Medicine, City of Health Services, Local Clinics, County/State Hospitals and all departments to participate.

Assessment Methods: Group reports, Portfolios, Peer reports, Self –reports, Supervisor reports and MCQs

G. Scholar/Researcher

I) Competencies

1. Develop the foundation necessary to engage in lifelong self-directed learning and critical inquiry.
2. Critically evaluate medical information and its sources and apply this appropriately to practice decisions
3. Contribute to the development, dissemination and translation of new knowledge and practices
4. Engage in research activities
5. Adhere to basic principles of ethical research practices

II) Enabling competencies (as demonstrated by):

1. Describe the principles of maintenance of competence
2. Describe principles and strategies for implementing a personal knowledge management system
3. Describe the principles of critical appraisal
4. Pose an appropriate learning question
5. Search for and identify relevant evidence
6. Critically appraise retrieved evidence
7. Integrate new learning into practice
8. Describe the principles of research and scholarly inquiry
9. Pose a scholarly
10. Conduct a systematic search for relevant evidence
11. Select and apply appropriate methods to address the question
12. Assist in carrying out the research
13. Disseminate the results
14. Apply scientific methods and approaches to medical research
15. Evaluate research outcomes of qualitative and quantitative studies in the medical/ scientific literature.
16. Formulate research questions, study designs or experiments to address health research questions.

Medical experts will be mainly from department of Community Medicine, Internal Medicine, Medical Research Council, all Departments, and clinical research centers.
Assessment Methods: MCQs, Research projects, Case reports and Community health projects.

6.4. The Curriculum Road Map:

S/N	Phases	Semesters	Classification of courses	Courses
1	General University requirements	Semester I	Basic Sciences	Applied Sciences : mathematics, Physics, Chemistry, Biology(Botany &Zoology), Behavioural Sciences(Psychology, Anthropology & Sociology), computer sciences, Communication Skills for Health workers, South Sudan Foundation.

2.		Semester II,III &IV	Pre-clinical subjects	Anatomy, Biochemistry and Physiology. Community Medicine. **Nursing skills and team work activities in the hospital begins here during holidays.(hospital placement 1)**
3.		Semester V, VI, VII	Para-clinical subjects	Pathology, Medical Microbiology& Immunology, Clinical Pharmacology, Principles of Internal Medicine and Surgery. Community Medicine **Junior clerkship(posting to wards) during the semesters and OPD activities during holidays(Hospital placement 2)**
4.		Semester VIII, IX, X &XI	Clinical subjects	Community Medicine, Forensic Medicine & Toxicology, Internal Medicine, Surgery, Pediatrics and Child Health, Molecular Medicine, Obstetrics & Gynaecology, Ophthalmology, ENT, Dermatology & Veneralogy, Psychiatry, Radiology and Medical Imaging, Orthopedics and Traumatology, Anaesthesiology and critical care Medicine. **Clerkship and rural residence/health centers for community Medicine(Holidays-transition from 4th to 5th), Clerkship during semesters(Hospital placement3)**
		Semester XII	Clinical subjects	**Senior Clerkship (Internal Medicine, Surgery, Pediatricsand Child Health and Obstetrics & Gynaecology). This will involve posting to wards and OPDs(Hospital placement4)**

6.5. New Courses Introduced

1. Introductory Courses
Introduction to Critical Care Management
Introduction to Medicine as a Profession
2. Applied Medical Sciences
Molecular Biology/Molecular Medicine
Biotechnology
Biomedical Informatics
Fundamentals of Bioengineering
Mathematical Medicine/Computational Biology
3. Medicine as a Profession
History/Landmarks of Medicine
Sociology of Medicine
Communication skills
Interviewing skills
Medical Jurisprudence and Professional Liability Issues
4. Critical Care Medicine
Basic life support
First Aid
Emergencies: Paediatric, Obstetric, Medical, Surgical

Palliative Care and End-of-Life Issues

6.6. Integrated Road Map

Course/Posting	Level	Semester	Type of Integration
Integrated Core-Basic Sciences	1- Year	I	Horizontal
Clinical Application of Core Basic Sciences	1-2nd Year	I-II,III	Vertical
Integrated Clinical Posting I	2nd-3th Year	IV,V	Horizontal
Integrated Clinical Posting II	3rd- 4th Year	VI,VII,VIII	Vertical
			Horizontal
Integrated Core Lectures	4th-6th Year	VII-XII	Vertical
			Horizontal
Integrated Block Posting I-III (Basic Medical Sciences)	3rd-5th Year	IV-XII	Horizontal
Infectious Disease Posting	4th 6th Year	IV-XII	Horizontal
			Vertical

Integration stages

A. Integrated core basic Medical sciences courses

1. Anatomy
2. Biochemistry
3. Physiology

B. Integrated applied pre-clinical sciences

1. Histopathology
2. Haematology
3. Chemical Pathology
4. Medical Microbiology and Immunology
5. Clinical Pharmacology

C. Integrated clinical sciences courses

1. Medicine
2. Surgery
3. Paediatrics and Child Health
4. Obstetrics and Gynaecology
5. Psychiatry

D. Sub-specialties

1. Anaesthesiology and critical care Medicine
2. Ophthalmology
3. Otolaryngology (ENT)
4. Plastic and Reconstructive Surgery
5. Urology
6. Radiology and Medical Imaging
7. Dermatology and Venearology
8. Molecular Medicine

E. Community Medicine

Preventive and Social medicine
Epidemiology
Human Nutrition
Complementary Medicine
Family Medicine

7.0. Programme Requirements

7.1. Admission Requirements

Currently the Ministry of Higher Education, Science and Technology determines admission criteria for enrolment of students into undergraduate medical education. The core subjects include: Mathematics, Physics, Chemistry, Biology and English Language.

Given the importance of having valid, evidence-based, comprehensive and fair student selection criteria, it is recommended that Universities (Medical Institutions) work hand in hand with Ministry of Higher Education, Science and Technology in synchronizing intake of students to medicine with the available human resources and infrastructure in the respective universities(**See the appendix on entry requirements to medical schools)**

7.2. Programme Structure, Composition and Duration

a. Course duration

i) The programme extends over a period of 6 years;
ii) An academic year would is divided into 2 semesters;
iii) The first year
Ist semester will be for General University Requirements, 2nd semester of the first year to the first semester semester of 3rd year will be for pre-clinical subjects, 3rd year 2nd semester of 3rd year till 4th year will be para-clinical subjects and core clinical practice training , 5th year to 6th year will be purely clinical subjects.

b. Units/credit system

One credit hour will be equivalent to 15 hours of lectures, 45 hours of tutorial hours and 45 hours for practical. The programme should be tailored to semester system in which each semester will be 19 weeks(16 weeks lectures, one week as a reading week, 2 weeks for examinations.

8. Learning& Instructional Methods

The major teaching and learning methods suggested to be used in the implementation of the curriculum are described below.

Lectures/Overviews;

1. Tutorials and Seminars;
2. Practical classes/ Skills laboratories;
3. Clinical demonstrations;
4. Clinical Teaching: Includes bedside teaching, ward rounds, ambulatory
5. care teaching,
6. operating theatre experiences, emergency and critical care;
7. Post-mortem demonstrations;
8. Laboratory practicals;
9. Fieldwork and community-based residency;
10. Self-directed learning; and
11. E-Learning complementary.

9.0. Methods of Instruction and Assessment

The SPICES (Student-centred Problem-based Integrated Community-based Electives Systematic) teaching strategy, by Harden will be adopted in this curriculum.

CBME teaching and learning strategies and assessment, self-directed learning, integrated system with early clinical exposure.

9.1. Community Orientation

This provides community-based education at regular periods throughout the training programme. This familiarises the students with the health needs of the communities. This will inoculate in the students

the correct attitudes and sense of accountability when delivering healthcare to and in the community. They will be able to appreciate the social determinants of health.

9.2. Self-directed learning/Research and Audit Orientation

Self-directed learning is one of the pillars for student-centred teaching and learning. Problem-based teaching will play a major role during tutorials, e-learning and development of community projects that solve health problems in the community. Students will be expected to develop critical and analytical skills as they explore the community and come up with health projects to serve the community. They will also develop the research/audit culture.

9.3. Inter-professional Education

Multidisciplinary teaching and learning. Aspects of inter-professional education will be taught in the new subject of Inter-professional Education (occurs when students from two or more professions learn about, from, and with each other to enable effective inter-professional collaboration to improve health outcomes, WHO.2010 (4)).

a) Desired competences of each discipline are identified: knowledge, skills and attitudes. These are believed to be responsive to the health needs of the community. These define the learning objectives of each discipline.
b) 2. The learning will thus be directed by these learning objectives with the assumption that their acquisition by the learners will make the learners relevant to the community
c) The teaching of the desired competences will be delivered with focus on the health priorities of the community they will serve.
d) Competency- based assessment is focused on testing the acquisition of competences. The student should not only be able to know (recitation of facts: just listing what she/he has memorised) and knows how (applies knowledge to scenarios) but be able to show (demonstration of skill: steps through established processes, e.g. diagnostic process) and finally does (performance: effectively identifies what needs to be done and carries it out) Miller's pyramid (1). The assessment is criterion-referenced measures that depend on integrating knowledge and skills derived from an aggregate of educational experiences and parts of the curriculum.
e) A competency uses a standard for judging competence that is not dependent upon the performance of other learners.
f) An explicit criteria must be used to assess the performance of competence so as to determine
g) Whether the learner has attained the required level to be considered "competent". The criteria or performance standards are not determined by the performance of other learners (not graded on a "curve") but by expert judgment of practitioners and educators in the field. Desirably ALL learners will achieve "competence "after training.
h) A competency informs learners, as well as other stakeholders, about what is expected of them.
i) CBE focuses on outcomes which make a more transparent and accountable to learners, policy-makers and other stakeholders.
j) Defining a discipline's values, goals and priorities is an implicit part of defining competencies. This enables the competencies to communicate these values and expectations to various stakeholders within and outside the discipline.

Model of CBE curriculum development

Health Needs of Society → Competencies Outcomes → Curriculum

9.4. Competency-based medical education

Acquisition of practical skills by students is emphasised. Sixty percent (60%) teacher-student contact time will be spent on practical/clinical teaching sessions and 40% on didactic teaching sessions. Small group teaching; tutorials will be emphasised with minimal large-group teaching by the way of lectures. Important lectures will be delivered in an integrated manner.

9.5. Integrated system-based teaching

Horizontal and vertical integration will be used: horizontal used in teaching disciplines/ courses that run concurrently while vertical integration will be disciplines/ courses that run sequentially. This will give students a better understanding of the clinical applications of the basic sciences along with early introduction to clinical aspect of medicine. The integrated clinical postings will be delivered as system-based lecture series.
The Republic of South Sudan MBBS programme applies a competency- based curriculum to produce a competent and reflective doctor. The students are trained using the SPICES model based on small group teaching, Promoting ICT resources in teaching and learning. The small group teaching and practical/ clinical sessions increase the opportunities of mentoring the students and also supervision of their projects.

9.6. Assessment Methods

I. Assessment drives learning. The approach would now be student-centred meaning that the thrust is more on what the student learns as opposed to the traditional system which is teacher-centred (where what lecturers teach is the driver of learning).
II. Assessment drives learning! Assessment will be competency-based. Successful candidates will need to satisfy the examiners that they “know” (knowledge), they “know-how” (applied knowledge), and shows (demonstration of skill by going through process e.g. diagnosis) and “does” (performance: effectively identifies) also be able to “show-how” at the prescribed level.

9.7. Formative assessment/feedback/summative assessment

Formative assessment assists in improving teaching and learning by gathering information from students and lecturers on how well they are both performing. Feedback to students and lecturers help improve the learning environment. This allows for continuous self-evaluation.
Measures that depend on integrating knowledge and skills derived from an aggregate of educational experiences and parts of the curriculum.

I. A competency uses a standard for judging competence that is not dependent upon the performance of other learners.
II. An explicit criteria must be used to assess the performance of competence so as to determine whether the learner has attained the required level to be considered “competent”. The criteria or performance standards are not determined by the performance of other learners (not graded on a “curve”) but by expert judgment of practitioners and educators in the field. Desirably ALL learners will achieve “competence “after training.
III. A competency inform learners, as well as other stakeholders, about what is expected of them. CBE focuses on outcomes which makes a more transparent and accountable to learners, policy-makers and other stakeholders. Defining a discipline’s values, goals and priorities is an implicit part of defining competencies. This enables the competencies to communicate these values and expectations to various stakeholders within and outside the discipline.

9.8. Assessment Criteria

Assessment criteria will be based on knowledge of applied basic sciences and relevant clinical sciences, clinical competence, professionalism and ethics. Failure in the clinical competence assessment will mean failure in that particular course. The assessments used should be reliable and appropriate reflecting the learning objectives/learning outcomes of the course. Criterion-based assessment.

Rationale:

The criteria for assessment in the clinical courses are knowledge of applied basic sciences and the clinical sciences, clinical competence, professionalism and ethics. Failure in clinical competence assessment will mean that the student has failed the course. Reliable and appropriate assessment methods will be used reflecting the learning outcomes/learning objectives of the particular course.

A. Continuous assessment (Formative)……..40%
i) Log of experiences and procedures done (necessary competencies):
with essential skills to be acquired for each course;
ii) Case reports; Portfolios.
iii) Project reports;
iv) Regular course examinations: written, practicals, clinical (OSCEs,
Short and Long cases), and Vivas;
v) Attitudinal assessment.
B. University End of semester/year Examinations (Summative)……..60%
i) Written: MCQs, SAQs, MEQs, LEQs;
ii) Clinical: OSCEs, OSPCE, Clinical Short and Long cases;
iii) Practicals;
iv) *Viva voce*.

10.0 INTEGRATED CLINICAL SCIENCES II

WHEN TAUGHT AND ASSESSED

(i) MEDICINE

When taught

Integrated Clinical Application of Medical Sciences: 1st yr(semester II) to 3rd Year(semester V).
Integrated Introductory Medicine I (3rd Year, Semester VI)
Medicine II (4th Year, Semester VII and VIII)
Medicine III (5th Year, semesters IX and X)
Medicine IV (6th Year, semester XI and XII)

When assessed and Assessment methods

1st year (semester II) to 3rd Year (semester V). Integrated Basic Medical Sciences
Formative: MCQ, Core/integrated Short Answer Question (SAQ)
Summative: MCQ, SAQ
Medicine I (3rd Year, Semester VI): Integrated Clinical Posting I
Formative: Portfolio, OSPE, Picture test, SAQ, Viva voce, long case, short case
Summative: Portfolio, OSPE, and MCQ
Medicine II (4th Year, Semester VII and VIII), Medicine III (5th Year, semesters IX and X):
Formative: Core/Integrated, OSCE, SAQ, Portfolio, Viva Voce
Summative: OSCE, MCQ, Log book, Long case, SAQ
6th Year (semester XI and XII: Medicine Senior Clerkship, Revision Clinical posting

Formative: Portfolio, Long case/short case, viva voce, picture test, OSPE
Summative: Portfolio, MCQ, Long essay/short essay, viva voce, picture test, OSCE, term paper

(ii) SURGERY

When taught

Integrated Clinical Application of Medical Sciences: 1st yr (semester II) to 3rd Year (semester V).
Integrated Introductory Surgery I (3rd Year, Semester VI)
Surgery II, Junior clerkship (4th Year, Semester VII and VIII)
Surgery III(5th Year, semesters IX and X)
Surgery IV, Senior clerkship (6th Year, semester XI and XII)

When Assessed and Assessment methods

1st yr (semester II) to 3rd Year (semester V).: Integrated Basic Medical Sciences
Formative: MCQ, Core/integrated Short Answer Question (SAQ)
Summative: MCQ, SAQ

Surgery I (3rd Year, Semester VI): Integrated Clinical Posting I
Formative: Portfolio, OSPE, Picture test, SAQ, Viva voce, long case, short case
Summative: Portfolio, OSPE, and MCQ

Surgery II (4th Year,Semester VII and VIII), Medicine III(5th Year, semesters IX and X):
Formative: Core/Integrated, OSCE, SAQ, Portfolio, Viva Voce
Summative: OSCE, MCQ, Log book, Long case, SAQ

6th Year (semester XI and XII: Surgery, Senior Clerkship, Revision Clinical posting
Formative: Portfolio, Long case/short case, viva voce, picture test, OSPE
Summative: Portfolio, MCQ, Long essay/short essay, viva voce, picture test, OSCE, term paper

iii) PAEDIATRICS AND CHILD HEALTH

When Taught

Integrated Clinical Application of Basic Medical Sciences: 1st yr (semester II to 3rd Year (semester V).

5th Year: Semester IX and X: Integrated Paediatrics and Child Health I&II, Junior Clerkship: Core Lectures

When Assessed and Assessment methods:
Formative: SAQ, Clinical skills assessment
Summative: MCQ, Social Paediatric seminars and case write ups, clinical case write up, Portfolio

6th Year: 1st and 2nd Semester: Revision, Senior Clerkship in Paediatrics &Child Health III&IV
Formative: SAQ, Log book/posting booklet
Summative: Portfolio, clinical examination Long case MCQ, Essay, Picture Test, Viva voce, short case, Term paper, Portfolio.

When Assessed and Assessment methods:
Formative: SAQ, Clinical skills assessment
Summative: MCQ, Social Paediatric seminars and case write ups, clinical case write up, Portfolio

v) OBSTETRICS AND GYNAECOLOGY AND REPRODUCTIVE HEALTH

When taught

Integrated Clinical Application of Medical Sciences: 1st yr (semester II) to 3rd Year (semester V)

Formative: MCQ, Core/integrated SAQ, Log book, OSPE, Picture test, SAQ, Viva voce,

Summative: MCQ, SAQ, Portfolio, OSPE

5th Year, Semester IX and X: Junior Obstetrics and Gynaecology Clerkship/Core Lectures

Formative: Log book/ posting booklet, MCQ, OSCE

Summative: nil

6th Year: Semester XI and XII: Senior Obstetrics and Gynaecology

Formative: Log book/ Posting booklet, group project, MCQ, Long case, short case, essay and short answer

Summative: MCQ, Long and short essay, Portfolio, picture test, OSCE, Viva voce, Term paper

iv) PSYCHIATRY AND MENTAL HEALTH

When Taught and Assessment Methods

Integrated Clinical Application of Medical Sciences: 1st yr (semester II) to 3rd Year (semester V)

Formative: MCQ

Summative: SAQ, MCQ, Term Paper

5th Year: 1st and 2nd Semester: Junior and Senior Clerkship Psychiatry

Formative: MCQ, Case write up

Summative: Integrated SAQ, Long and short cases, long and short essay, Portfolio, OSCE, Viva voce, Term paper

11.0. Examination regulations

i) Certification will be an MBBS Degree.

ii) Distribution of marks will be in form of letter wording grading system as indicated below and will be specified in all the subjects/courses taught.

iii) The pass mark will be 50% and any marks below will be considered as a fail.

iv) It is mandatory to pass examinations in order to proceed to the next year of study;

v) MBBS Degree is not classified.

Grading system.

Marks %	**Letter grade**	**Letter wording**	**Grade points**
80-100	A	Excellent	4.00
70-79	B+	Very Good	3.50
60-69	B	Good	3.00
50-59	C	Pass	2.00
≤50	F	Fail	0.0

The letter wording grading concept will be applied in this curriculum. The whole grading system will be used as a key in the certificate transcript for easy interpretation of results by any other institution globally that uses a different type of grading.
The medium of instruction will be English language and it shall be indicated in certificates (Transcript and bachelor certificate).

12.0. Credit Transfers

i) Students seeking transfer must have satisfied the requirements and passed all the relevant subjects/courses, with the results reflected in an official transcript;
ii) The student should present a letter from the Dean in their previous institution;
iii) The students seeking transfers should have taken the subject/course for a duration not more than three years prior to their seeking of credit transfer;
iv) Transfer of credits will be subjected to the availability of spaces in the institutions;
v) The request for transfer should be through the Ministry of Higher Education, Science and Technology to the institution of the student interest
vi) The South Sudan General Medical council shall be concurrently notified **of the credit transfers and graduation by all the institutions certifying graduants**.

13.0. Students with Medical Problems

i) Medical faculty/college/school will take the role of screening students of the university on medical ground and create a baseline data for the students (new ones) and update data for the old students.
ii) Students with medical problems that make it difficult for them to continue with their studies without interruptions in any academic year or who may put patients/others at risk, should be subjected to career advice and discontinued from the none or medical programme at the earliest possible time.
iii) Students who are not fit in the respective programmes will be sent to a counselor to assist smooth transfer of student to the most suitable programmes. Successful students will be recommended to the respective administration of the respective university. The Ministry of Higher Education, Science and Technology shall be notified immediately.
iv) In special circumstances, a student shall be discontinued on medical grounds if found unfit to qualify as a medical doctor, and South Sudan General Medical council shall be notified.

14.0. Course Description

Course code of each course will be provided by respective Medical institutions

14.1. Semester I: General University requirements (Applied Basic Sciences& Other Courses)

Courses to be taught: Applied Mathematics, Physics, Chemistry, Biology (Botany& Zoology), Principles of Genetics, Behavioural Sciences, Computer Sciences for Health Workers, Communication Skills for Health Workers.

Credit hours: 35

Contact hours: 360

Practicals: 495

(1) Course title: Applied Mathematics

Credit hours: 3
Contact hours: 30
Practical/Clinical Round: 45

Course Description

- The course introduces students to sets, Relations, Mapping, The real number system and properties, inequalities, intervals, Discrete-Time Models, Sequences, Difference Equations, Limit and Continuity then they progress to differential calculus for polynomial, exponential and logarithmic functions and their applications to curve sketching, maxima and minima, and it emphasizes on **applications rather than theory.** Students apply these tools to variety of basic sciences, including medical issues, and epidemics.
- Students are introduce to the definite and Indefinite Integral then they progress to Integration Techniques and Computational Methods, Numerical Integration, The Taylor Approximation, Table of Integrals, Applications of Integration, and first order Differential Equation. Students apply these tools to variety of basic sciences, including medical issues, and epidemics.

Course Objectives

- The Course introduces students to **differential Calculus and to the interpretation of the derivative as a rate of change and introduce antiderivatives and its applications in biology. Pre-request,** sets, Relations, Mapping, The real number system and properties, inequalities, intervals, Discrete-Time Models, Sequences, Difference Equations.

  Specifically, students will learn how to:
- Communicate and interpret mathematical information using the set notation.
- Describe mathematical relationship using functions.
- Analyse the type of a relationship represented by a given function.
- Describe discrete-time models of population growth and decay.
- Calculate limits and fixed points of sequences, and describe the relationship between fixed points of sequences.
- Define limits and continuity of functions.
- Differentiate various functions of a single variable.
- Compute the derivative of functions and apply the techniques to the solution of simple and optimal problems in biology

Course Outcomes

At the end of the course, students should be able to

- Communicate and interpret mathematical information using the set notation.
- Describe mathematical relationship using functions.
- Analyse the type of a relationship represented by a given function.

- Describe discrete-time models of population growth and decay.
- Calculate limits and fixed points of sequences, and describe the relationship between fixed points of sequences.
- Compute the indefinite and definite integrals for variety of functions and apply **integration techniques to the solution of simple problems in biology**.
- Solve separable differential equations, find equilibria and determine their stability graphically and analytically, and use system of differential equations to describe **biological systems with multiple interacting components.**
- Calculate limits and fixed points of sequences, and describe the relationship between fixed points of sequences.
- Define limits and continuity of functions.
- Differentiate various functions of a single variable.
- Compute the derivative of functions and apply the techniques to the solution of simple and optimal problems in biology.

Methodology

- The teaching includes lectures, and group tuition (seminars).An emphasis is placed on problem-solving.

References

- Thomas and Finney (1995). Calculus and Analytic Geometry (9th Edition). Amazon Publishers.
- James Stewart (2008). Calculus: Early transcendental. Thomas Learning, Inc.
- Croft. , & Davison, R. (2008). Mathematics for Engineers: A modern Interactive Approach (2nd Ed.) Upper Saddle River, NJ: Pearson Prentice Hall. ISBN: 9780132051569.
- William L. Briggs & Lyle Cochran (2011). Calculus. Pearson Publishers.
- Claudia Neuhauser (2011). Calculus for Biology and Medicine (3rd Ed). Pearson Publishers.
- Philip, J. D. & Philip, R. (2007). Methods of Numerical Integration (2nd Ed). Mineola, NY: Dover Publications. ISBN: 9780486453392.
- Marsden, J.E & Weinstein, A. (2005). Calculus II (2nd Ed.) New York Springer-Verlag. ISBN: 0387909753.

(2) Course title: <u>Applied Chemistry</u>

Credit hours: 8

Contact hours: 75

Practical/Clinical Round: 135

Course Description

- Organic chemistry is at the heart of biology and medicine.
- This course is an introduction to the fundamental chemistry of carbon-containing compounds, including three-dimensional structures, chemical properties, and methods of structural identification, reactions, and syntheses.

- The course explores some of the major classes of organic compounds: alkanes, alkenes, alkynes, alkyl halides, alcohols, and ethers, with an emphasis on reaction mechanisms and multi-step syntheses.
- This course is an intensive, comprehensive introduction to the chemistry of carbon and its importance to biological molecules.
- Topics include current ideas of bonding and structure, major reaction mechanisms and pathways, a discussion of the analytical tools used to determine the structure and stereochemistry of organic compounds (such as infrared and NMR spectroscopy), and some of the chemistry of amino acids, peptides, carbohydrates, and nucleic acids.

Course Objectives

Students will be able to:

- Analyze the structure of organic compounds by recognizing main functional groups, naming the compounds using the I.U.P.A.C. system, and predicting their properties using the type of bonding, hybridization state, intermolecular forces and stereochemistry;
- Describe mechanisms of reactions: free radical, nucleophilic substitution, elimination and electrophilic addition, and apply this knowledge to predict the major product in organic reactions, such as those involving hydrocarbons, alcohols, alkyl halides, and alkenes;
- Analyze the nature of a reagent: as a nucleophile, free radical, or electrophile and use this knowledge to propose the synthesis of organic compounds, such as a hydrocarbons, alkyl halides, alcohols, or alkenes; and
- Demonstrate proficiency in organic laboratory skills as they pertain to: chemical information, safe handling, use and disposal of organic compounds; synthetic procedures, including isolation, purification, and structure elucidation of obtained products; stoichiometry and use of instrumentation; and writing of laboratory notebooks and reports in accordance with current scientific journals styles.

Course Outcomes

Based on satisfactory completion of this course, a student will be able to:

- Draw the structure of organic molecules and identify the functional groups
- Describe organic compound and how they are composed.
- Analyze properties, reactions, and mechanism of the reactions of organic compounds.
- Interpret structure, stereochemistry, nomenclature, and reactions of hydrocarbons, alkyl halides, alcohol and ethers.
- Explain the synthesis of hydrocarbons, alkyl halides, alcohol and ethers.

Methodology

The teaching includes lectures, laboratory sessions, and group tuition (seminars).An emphasis is placed on problem-solving.

References

- Francis A. Carey, Organic Chemistry, Part A, 7th Edition.
- Solomons, T. W. Graham; Fryhle, Craig, B., Organic Chemistry, 11th edition, 2016, John Wiley & Sons, Inc. (ISBN: 978-0-471-68496-1).
- Organic Chemistry by K. Peter C. Vollhardt and Neil E. Schore, W. H. Freeman; 6th Edition.
- Concepts and Models of Inorganic Chemistry by Bodie E. Douglas, Darl H. McDaniel, John J. Alexander, John Wiley and Sons; 3rd edition.
- General Organic and Biochemistry, Katherine J. Denniston, Joseph J. Topping, and Robert L. Caret, 6th Edition.

(3) Course title: Biology(Botany and Zoology)

Credit hours: 6

Contact hours: 60

Practical/Clinical Round: 90

Applied Botany

Course Description

- This course is designed for students interested in pursuing a career in a health field and who would like to gain additional knowledge in the area of biology (Botany). This honors level course is a general course that furnishes the principles and gives a broader understanding of the science of botany to the audience. The course is organized into:
- An overview on the science of botany (Introduction to the science of botany, definitions and branches of botany) and its uses in our daily life.
- Lower plants (Algae and Fungus) its growth and Development, Structure, Life cycle, Major Characteristics, Classification, Uses and Benefits.
- Mosses growth and Development Structure, Life cycle, Major Characteristics, Classification, Uses and Benefits.
- Ferns growth and Development Structure, Life cycle, Major Characteristics, Classification, Uses and Benefits
- Angiosperms, gymnosperms Growth and Development Structure, Life cycle, Major Characteristics, Classification, Uses and Benefits.
- Angiosperms, gymnosperms, structure and anatomy of the root; stem; the leaves and the flower, types of roots and their modification.
- Medicinal uses of some herbs/plants. Emphasis should be made on the medicinal uses of the local herbs/plants

Course Objectives

- **Students will:**
- Know the different branches of botany and the importance of the science of botany in the field of medicine
- Describe the morphology and anatomy of lower plants, mosses, ferns, Angiosperms and Gymnosperms.
- Differentiate between the monocot and the dicot plants' root, stem, leaves and flowers
- Identify and recognize the differences among broad branches of botany and be able to single out those branches with applicability in the field of medicine.

- Distinguish between lower and higher plants
- Identify and Classify plants into food, nonfood and medicinal and or harmful plants found within or in the peripheries of Juba.
- Know basic nomenclature, local and scientific names of some of plants including medicinal plants which occur within or in the peripheries of Juba town
- Know the chemical contents and of some of the medicinal plants which occur in the region and in South Sudan.
- Describe the traditional and/or medical uses some of the medicinal plants that may occur in the region and South Sudan.

Course Outcomes

- At the end of the course , students should be able to:
- Identify and recognize the differences among broad branches of botany and be able to single out those branches with applicability in the field of medicine.
- Distinguish between lower and higher plants
- Identify and Classify plants into food, nonfood and medicinal and or harmful plants found within or in the peripheries of Juba.
- Describe the difference between algae, bacteria and fungi and explain this difference on the basis of habitat, structure and function.
- Explain about structure, classification, reproduction, life cycle and economic importance of Gymnosperms
- To differentiate between harmful and edible fungi and explain this different on the basis of chemical composition.
- Morphologically identify, classify and describe plants
- Describe the consequences of different types of plant roots, stems, leaves and flowers modification.
- Distinguish between medicinal plants and other plants
- Explain and describe the traditional and medical uses of some of the medicinal plants of South Sudan.
- Write the chemical content of some common medicinal plants in South Sudan.

Methodology

The teaching includes lectures, laboratory sessions, and group tuition (seminars).An emphasis is placed on problem-solving.

References

- Janice Glim-Lacy and Peter B. Kaufman .Introduction to Plants Major Groups, Flowering Plants Families.2end.Edition, Springer Science+Business Media, Inc., New York, NY 10013, USA.
- ASHOK M. BENDRE and ASHOK KUMAR (2010).A textbook of Practical Botany -1. RASTOGI PUBLICATIONS, NEW DELHI, INDIA.
- Dawn C.P. Ambrose, Annamalai Manickavasagan and Ravindra Naik (2016).Leafy Medicinal Herbs, Plant Chemistry, Post-harvest, Technology and Uses. CABI Nosworthy Wallingford Oxfordshire OX10 8DEUK.
- James A. Duke, Mary Jo Bogenschutz-Godwin, Judi du Cellier and Peggy-Ann K. Duke (2002).A handbook of Medicinal Herbs.2nd.Edition, CRC Press LLC,USA.

Applied Zoology

Course Description

This course is designed for students interested in pursuing a career in a health field and who would like to gain additional knowledge in the area of biology (Zoology).

The course offers an introduction to the animal kingdom providing the foundation for advanced studies in medicine, zoology, and other biological sciences. This honors level course furnishes the principles and gives a broader understanding of the science of zoology to the audience.

The course is organized into:

- General Introduction to the science of zoology, branches and subject matter of Zoology; Nomenclature
- Introduction to the invertebrates ,Kingdom Protista, Taxonomic History and classification;
- Protists Support and Locomotion;Nutrition; Reproduction; Respiration.
- Protist Phyla with Medical Importance, Phylum Kinetoplastida and its representative, Phylum Apicomplexia its representative , Phylum Parabasilida its representative ,
- Phylum Rhizopoda, Phylum Actinopoda, Phylum Choanoflagellata, Phylum Opalinida.
- An overview of Sponges and Cniderians, general characteristics
- Phylum Platyhelminthes, general characteristics, taxonomy and representatives of medcal importance
- Phylum Nematoda, general characteristics and its medical importance
- Phylum Arthropoda, general characteristics, taxonomy;
- Class insecta, introduction to insects of medical importance taxonomy and representatives and roles in disease transmission and control mechanisms

Course Objectives

Students will:

- Know the difference branches of zoology and relate them to the field of medicine
- Understand how animals are classified and the importance of this classification
- Explain on the basis of nomenclature how animals are related to each other.
- Know the structure, Support and Locomotion; Nutrition; Reproduction; Respiration in Protists, Sponges, Cnidarians, Platyhelminthes, Nematodes and Insects.
- Explain about the general characteristics of animals from Protists to Chordates
- Identify those Protists, Platyhelminths, Nematodes and Insects of medical importance.

- Describe the distribution of Protists, Platyhelminths, Nematodes and Insects of medical importance in South Sudan
- Account for the diseases caused by Protists, Platyhelminths, Nematodes and Insects
- Critically discuss the most important evolutionary patterns of animals from the most primitive to the most advanced forms.
- Critically discuss the most important characteristics of Chordates and explain how all Chordates are related evolutionary.
- Describe the morphology and anatomy of class Pisces, Amphibia, Reptilia, Aves and Mammalia.
- Discuss analyze the morphological and anatomical differences between members of classes: Pisces, Amphibia, Reptilia, Aves and the class Mammalia.
- Explore some zoological evolutionary morphological, anatomical and embryological concepts.

Course Outcomes

Upon completion of this course the student will be able to:

- Differentiate between the different branches of zoology and know how some of these branches are related to the field of medicine.
- Describe the structure, support, locomotion, reproduction and respiration in Protists, Sponges, Cnidarians, Platyhelminthes, Nematodes and Insects.
- Apply the principles of Nomenclature principles in classifying animals
- Explain about the disease-causing Protists, Platyhelminthes and Nematodes.
- Account for the distribution of disease-causing Protists, Platyhelminths and Nematodes with especial reference to South Sudan.
- Explain chordate adaptation based on their morphology, physiology and anatomy using evolutionary concepts.
- Analyze evolutionary patterns of animals from the most primitive to the most advanced forms.

Zoology text books and References

1. Stephen A. Miller , John P. Harley (2016).Zoology.10th.Edition. McGraw-Hill Education, 2 Penn Plaza, New York, NY 10121.
2. Richard C. Brusca, Wendy Moore, Stephen M. Shuster. (2016). Invertebrates. 3rd.Edition. Sinauer Associates, Inc., Publishers Sunderland, Massachusetts USA.
3. Hickman (2011). Animal Diversity, 6th. Edition, McGraw Hill Higher Education.
4. Hickman, Cleveland P., Jr., Keen (2007).Laboratory Studies in Integrated Principles of Zoology, 14th. Edition, McGraw-Hill Companies.
5. Hickman, Cleveland P., Jr., Keen (2010). Integrated Principles of Zoology. 15th. Edition. McGraw-Hill.

(4) Course title: Applied Physics

Credit hours: 6

Contact hours: 45

Practical/Clinical Rounds: 135

Course Description

An introduction to key physical principles as applied to medical imaging and radiation therapy. Topics covered will include: imaging metrics, ionizing radiation and radiation safety, radioactivity, radiation therapy, computed tomography, nuclear medicine, ultrasound, and magnetic resonance imaging. This Medical physics course covers introduction of medical physics, atomic spectra, nuclear physics, X-ray applications in biology and medicine, fluids, Electricity and medicine, electricity and magnetism, geometrical optics and waves and sounds. The aim is to introduce biomechanical descriptions of the human body. We look at its structure and its performance as a physical machine. The structural characteristics of human bones and tissue are investigated, together with the mechanical functions of the skeleton and musculature.

Course Objectives

To equip the students with basic knowledge of electricity, magnetism, optics, waves and sounds and their applications of in medicine especially for diagnosis and therapy, upon completion of this course student will be able:

- Develop basic understanding of medical physics concepts,
- Develop problem-solving and critical-thinking skills,
- Learn to integrate and apply various physics concepts to a single problem,
- Develop scientific communication skills.

Course Outcomes

At the end of the course, the student shall be able to:

- Describe the concept of the Medical Physics

- Knowledge of the normal structure and function of the body and its major organ systems with emphasis on content applicable to clinical diagnostic imaging and/or radiation.
- Knowledge of atomic spectra, nuclear physics, X-ray applications in biology and medicine.
- Knowledge of fluids and Electricity.
- Knowledge of electricity, magnetism, geometrical optics, waves and sounds.
- Knowledge of radiation and radioactivity, its properties, units of measure, dosimetry measurement concepts and methods

Methodology

Course delivery methods will include lectures and demonstrations that discuss key terms, concepts and formulae of the assigned chapter. During the lecture a quiz about the basic concepts of each chapter will be given. The student is expected to read one chapter and solve the assigned problems each week. This will require an average of five hours of study outside of the classroom each week. The previously assigned problems will be collected for grading and the solutions will be derived in class. This process is designed to help the student thoroughly understand the concepts and applications of the material covered.

References

- Introduction to Physics in Modern Medicine, Suzanne Amador Kane, 2nd Edition.
- Introduction to Health Physics, Herman Cember and Thomas E. Johnson, 4thEditiion, McGraw-Hill, 2009.
- Medical Imaging Physics, William R. Hendee, E. Russell Ritenour, and Wiley-Liss, 4th Edition, 2002.
- Intermediate Physics for Medicine and Biology, Russel K. Hobbie and Bradley J. Roth, Springer-Verlag, 2007.
- Radiation Therapy Physics, William R. Hendee and Geoffrey S. Ibbot, 2nd Edition, Mosby, 1996.
- P. Horowitz and W. Hill, “The art of electronics’, (2 nd edition), Cambridge university press, Cambridge, 1995.
- A.P. Malvino, “Electronic principles’, (6th edition), Tata McGraw Hill Publ.Co. Ltd., New Delhi, 1999.
- T.L. Floyd, Electronic devices’, (6th edition), Pearson Education Inc., New Delhi, 2003.
- R.F. Coughlin and F.F. Driscoll, ’Operational amplifiers and linear integrated circuits’, (6th edition), Pearson Education Inc., New Delhi, 2001.
- T. L. Floyd, Digital Fundamentals, (8th Edition), Pearson education Inc., New Delhi, 2003.
- S. Brown and Z. Vranesic, ’Fundamentals of digital logic with Verilog design’, Tata McGraw Hill Publ Co.Ltd., New Delhi, 2003.
- H. Skalsi, “Electronic instrumentation (2th Edition), Tata McGraw Hill Publ. Co. Ltd., New Delhi,2004

(5) Course title: Principle of Genetics

Credit hours: 2

Contact hours: 15

Practical/Clinical Round: 45

Course Description

- This course covers principles of prokaryotic and eukaryotic cell genetics. Emphasis is placed on the molecular basis of heredity, chromosome structure, Patterns of Mendelian and non-Mendelian inheritance, evolution, and biotechnological applications. Upon completion, students should be able to recognize and describe genetic phenomena and demonstrate knowledge of important genetic principles.

Course Objectives

During this course, the lecturer should be able to demonstrate the followings to the students how:

- To identify and describe the process and purposes of the cell cycle, meiosis, and mitosis, as well as predict the outcomes of these processes.
- To solve transmission genetics problems, make accurate predictions about inheritance of genetic traits, and map the locations of genes.
- To identify the parts, structure, and dimensions of DNA molecules, RNA molecules, and chromosomes, and be able to categorize DNA as well as describe how DNA is stored.
- To accurately diagram and describe the processes of replication, transcription, translation, as well as predict the outcomes of these processes.
- To describe what causes and consequences of DNA sequence changes and how cells prevent these changes, as well as make predictions about the causes and effects of changes in DNA.
- To describe the processes of gene regulation and predict how a gene will be expressed under specific circumstances.
- To learn and practice common genetics laboratory and field techniques.
- To describe applications and techniques of modern genetic technology, as well as select the correct techniques to solve practical genetic problems.
- To carry out genetics laboratory and field research techniques.
- To describe experimental results in written format both informally and in formal manuscript format.

Course Outcomes

After the completion of the course, students will be able to:

- Describe the composition and structure of DNA and the basic steps of DNA replication.
- Describe the composition and structure of RNA and the basic steps of transcription.
- Describe the composition and structure of protein and the basic steps of translation.
- Describe the structure and function of a gene.
- Describe examples of human genetic disorders caused by gene mutations and chromosomal rearrangements.
- Explain Mendel's Principles of Segregation and Independent Assortment.
- Describe the chromosomal basis of inheritance.
- Explain linkage, recombination, and the mapping of genes on chromosomes
- Describe non-Mendelian inheritance.
- Explain the regulation of genes in prokaryotes.
- Explain the regulation of genes in eukaryotes.
- Describe cell-cycle regulation and the genetics of cancer.
- Explain how genetics is used to study development.
- Describe the genetic analysis of populations.

Methodology

The teaching includes lectures, and group tuition (seminars).An emphasis is placed on problem-solving.
References

- Daniel, L. Hartl and Elizabeth, W. Jones, (1998). Genetics; Principle and Analysis. 4th Edition; Printed in the United States of the America by Jones and Bartlett Publishers. Inc. ISBN: 0-7637-0489-X.
- D. Peter Snustad and Michael J. Simmons are the authors of Principles of Genetics, Binder Ready Version, 7th Edition, published by Wiley.

(6) Course title: Behavioral Sciences (Psychology, Anthropology& Sociology)

Credit hours: 2

Contact hours: 30

Practical/Clinical Round: 0

Course Description

- This course cover topics that include introduction to behavior sciences, understanding human behavior, behavior modification, human behavior and health, defense mechanisms, personality, psychological health and testing, child development, psychological methods, motivation, emotion, intelligence, the individual, family and society, socialization process, culture and health, gender, social inequalities and physician-patient relationship and medical ethics.

Course Objectives

- To provide students with basic principle of Behavioral Sciences and their importance in health, Bio-Psycho-Social Model of Healthcare, Desirable attitudes, Correlation of brain, mind and Behavioral Sciences and Roles of a doctor.
- To teach the students to conceptualize patient problems by using a bio-psychosocial-cultural-spiritual formulation.
- To show the students how to apply the vast theoretical material through the use of problem based learning.

Course content

- Developmental psychology; theories of motivation and learning; proper socialization process; emotional development and support.
- Concepts in sociology; emerging relationship between medicine and sociology; social behaviours and disease occurrence; health seeking behaviours; the sick role.
- Basic principles of anthropology: concept of culture, health and disease; cultural concepts of illness; ethnomedicine.
- Pregnancy and childbirth; Reproductive issues; Development in early
- infancy; Childhood and child health; Adolescence; Adulthood and mid
- age; Ageing; Bereavement.
- Personality development; Understanding learning; Perception; Memory
- and forgetting; Development of sexuality; Intelligence; Development of thinking.

Factors influencing patient behaviour

- Personality
- Psychodynamic and behavioural factors, related past experience
- Family and cultural factors, including socio-economic status
- Adaptive behavioural responses to stress and illness
- Maladaptive behavioural responses to stress and illness
- Interactions between the patient and the physician or the health care system.

Society and health

- Understanding groups; concepts of health, illness and disease; measuring health and illness; changing patterns of health and illness; social class and health; gender and health; ethnicity and health; quality of life; media and health; ageing, society and health; housing, homeless and health; work and health; education and health; unemployment and health; labeling and stigma.
- Impact of illness on individual, family and community
- Death and dying
- Coping with illness and disability: counseling; adaptation, coping and control; stress management; cognitive behaviour therapy; role of career; self-help groups; palliative care; complementary therapies; management of pain; health beliefs and behaviour; bereavement.

Course Outcomes

At the end of the course, the students will be able to:

- Define social & behavioral sciences and discuss their role in Community Medicine.
- Describe the role of the family/community in health and disease.
- Measure the socio-economic status of a family and describe its importance in health and disease.
- Construct, pre-test and validate questionnaire/interview schedule.
- Define attitudes.
- Describe the process of attitudinal development and methods to change.
- Construct pretest and validate a questionnaire/interview schedule to test attitudes of a community.

Methodology

The teaching includes lectures, and group tuition (seminars).An emphasis is placed on problem-solving.

References

- Behavioral Science, Gene R Quuin, 2nd Edition.
- A Handbook of Behavioral Sciences for Medical and Dental Students, Mowadat H. Rana, Sohail Ali and Mansoor Mustafa, University of Health Sciences Lahore, 2006.
- Medicine in Society: Behavioural Sciences for Medical Students, Christopher Dowrick, Arnold Publisher, 2001.
- Behavioural Sciences in Clinical Medicine by Wolf, Stewert, 1976.
- Developmental Psychology for Healthcare Professions, Katherine A. Billingham.
- An Outline of Sociology as Applied to Medicine, David Armstrong.

(7) Course title: Computer skills for health workers

Credit hours: 2

Contact hours: 15

Practical/Clinical Round: 45

Course description.

- Computer Skills is aimed to provide students with transversal skills critically important to success fully develop both their academic process and their professional careers.
- The objective of this course is primarily to provide the student with study skills including time m anagement, library research, teamwork, and a short introduction to academic writing and mana gement of information. Secondarily to improving student's computer skills and increasing their proficiency with commonly used medical applications. Skills for developing effective communications and treatment of information are the core of the course and will be achieved with practical applications and active students' engagement.

Course Content

- Classification of computers: Microcomputer; minicomputer; palm computers; main frame computer; supercomputers; Hardware, and software: Input devices: monitor; mouse; voice data entry; light pen; scanner; key board; touch screen; Output devices: monitor; printer; plotter; Storage devices: buffer; central processing unit; back-up; file storage devices; Operating systems; Utilities and operations software.
- Principles of data management: Setting up files; modifying; storing; data coding; data entry; data processing and analysis; databases.

Course Outcomes

At the end of the course, the student should be able to:

- Describe the classification and components of computer system.
- Apply the principles of computer operating systems and information processing.
- Apply common computer software packages for word processing and data management.
- Apply the skills of computer technology in learning, delivery of health care and research.
- Software and programming: System programmes; operating systems; utility
- Programmes ; special purposes programmes ; application programmes ; programming languages ; Word processing : word perfect ; word ; SPSS; EPIinfo;
- Internet access; Medline; Cochrane databases; World wide web;
- Ovid: Statistical programmes: statistical tests; data entry; data cleaning.
- Computer applications in health services and research.
- Medical literature search, medical record keeping, and retrieval; and searching for information;
- Telemedicine; Virtual reality; security of information, levels of access and confidentiality.

Methodology

The teaching includes lectures, laboratory sessions, and group tuition (seminars).An emphasis is placed on problem-solving.

References

- Burton, G. (2013). Presenting: deliver presentations with confidence. London: Collins.
- Cottrell, S. (2003). The Study Skills Handbook. 2nd Edition. Basingstoke: Palgrave Macmillan. 4th E dition. published 2013
- Charte, F (2016) Microsoft Excel 2016. Madrid: Anaya Multimedia, 2016.

- Creme, P. and Lea, Mary R. (1997) Writing at University: A Guide for Students. Buckingham: Open University Press.
- Grauer R., Hogan L, and Poatsy M.A. (2011) Exploring Microsoft Office. Getting Started with Win dows 7. Pearson Education, Inc., Publishing as Prentice Hall.
- Grauer R., Hulett, M. and Poatsy M.A. (2011) Exploring Microsoft Office Word 2010, Prentice Hal l. Pearson Education, Inc., Publishing as Prentice Hall.
  Johnson K. (2010) Student Writing Guide. Reading, Research and Writing Strategies. University of Minnesota.
- Liengme, B. V., and Ellert, D. J. (2009).
- A Guide to Microsoft Excel 2007 for Scientists
  and Engineers. Amsterdam; Boston, Academic Press/Elsevier.
- (Online resource at UAB Library).
- The Smarter Student: Study Skills and Strategies for Success at University. McMillan, K. and Wey ers, J. (2006), Harlow: Pearson Education.
- Murray, N. (2008) Writting up your university assignments and research projects: a practical han dbook. Maidenhead, Berks: Open University Press: McGraw-Hill.
- Wallace, M. (2004) Study skills in English: a course in reading skills for academic purposes. Cambridge: Cambridge University Press, 2004

(8) Course title: Communication Skills for Health Workers

Credit hours: 2
Contact hours: 30
Practical/Clinical Round: 0

Course Description

- This is an introductory course in human communication. We'll learn about basic communication theories and explore different types of communication, such as interpersonal, small group, and public communication. Students will have opportunities to develop and apply communication skills by completing exercises and assessments, participating in group interactions, and delivering presentations.

Course objectives

To enable the graduate develop the knowledge, skills and attitudes necessary for effective and sensitive communication with patients, families, care givers professional colleagues and other stakeholders.

Course Content

- Concept and principles of human communication: verbal and nonverbal communication; Language; Interviewing; definition, environment; behaviour, techniques.

Interview; recording reproduction.
History taking and communication skills: Questioning and active listening: open questions, focused and closed questions, probing questions; Listening: effective listening, verbal and non-verbal cues, appropriate body language, facilitative comments; Encouraging; Summarizing Socio-cultural variations in human communication.

- Use of appropriate communication skills for the patients' culture during interviews, Ethics in interviewing.
- Challenging patients: angry patients; reticent patients; talkative patients; those with physical impairments which hinder communication i.e. deafness, speech impediments.
- Communicating about sensitive subjects (breaking bad news): what constitutes a sensitive subject; factors that can make us reluctant to impart bad news; empathy with the patient; sexual history importance of a sexual history both in physical and psychological illness, sexual history from eg. the opposite sex, adolescents, elderly people, disabled people, people from different cultures.
- Communication with professional colleagues and other stakeholders including care givers, family members, community, financiers, politicians, media, etc.

Course Outcomes

By the end of this, students will be to:

- Explain the theories and principles of relating to human communication
- Demonstrate interviewing skills appropriate for the doctor patient interactions.
- Explain the importance of socio-cultural knowledge, age, gender and emotional status during doctor patient interactions.
- Cope when communicating with patients in difficult or delicate circumstances.
- Demonstrate empathy to the patient's experience of illness and health care.
- Demonstrate effective communication with relevant stakeholders.

Methodology

The teaching includes lectures, and group tuition (seminars).An emphasis is placed on problem-solving.

References

- Lehman, C. M., DuFrene, D. D., (2013), BCOM4. South-Western Cengage Learning. ISBN-13: 978-1-133-56224-5 or ISBN-10: 1-133-56224-8.
- Bovee, Courtland, L., John V. Thill and Barbara E. Schatzman. Business Communication Today: Seventh Edition. Delhi: Pearson Education, 2004.
- Lesikar, Raymond V and Marie E. Flatley. Basic Business Communication: Skills for Empowering the Internet Generation: 9th Edition. New Delhi: Tata McGraw-Hill Publishing Company Ltd., 2002.
- Pease, Allan and Barbara Pease. The Definitive Book of Body Language. New Delhi: Manjul Publishing House, 2005
- Prasad, P. The Functional Aspects of Communication Skills, Delhi.
- Sen, Leena. Communication Skills, Prentice Hall of India, New Delhi.
- McCarthy, Michael. English Vocabulary in Use, Cambridge University Press.
- Rajinder Pal and PremLata. English Grammar and Composition, Sultan Chand Publication.
- Jones, E.A. (1994). Essential Skills in writing, speech and listening, and critical thinking for college graduates: Perspectives of faculty, employers, and policymakers. University Park, P. A.: National Center for Postsecondary Teaching, Learning, and Assessment.
- Jones, E. A. (Ed.) (1996). New directions for higher education: Vol. 96, Preparing competent college graduates: Setting new and higher expectations for student learning. San Francisco: Jossey-Bass.

- Quianthy, R. L. (1990). Communication is life: Essential college sophomore speaking and listening competencies. Annandale, VA: National Communication Association.
- Successful Science Communication: Telling It Like It Is. By David J. Bennett, Richard C. Jennings. Publisher: Cambridge University Press (2011) ISBN: 978-0521176781
- Health Communication: From Theory to Practice (2nd Edition). By Renata Schiavo. Publisher: Jossey-Bass (November 4, 2013) ISBN: 978-1118122198
- The Routledge Handbook of Health Communication (2nd Edition): By, Teresa Thompson, Roxanne Parrott, and Jon F. Nussbaum. Publisher: Routledge (April 29, 2011) ISBN: 978-0415883153

(9) Course title: South Sudan Foundation/studies

Credit hours: 4

Contact hours: 60

Practical/Clinical Round: 0

Course description.

We are dependent on nature for our survival and well-being. The choices we make on resource use will affect our physical and economic well-being well into the future. This course is intended equip the students with general information about the natural resources and its impact on health in the Republic of South Sudan. This course will introduce the natural resources of the Republic of South Sudan, including both renewable and non-renewable resources. Students will learn problems associated with the use or and misuse of natural resources. The course will focus on natural resources types, importance, utilization, constraints, products, values as well as conservation and management. It is composed of agriculture, animal production, fisheries, and forestry, geology and wildlife sciences.

Course Aim

The course aims to inculcate in the students the importance of natural resources in health and our daily lives and illustrate how our lives are linked to their preservation and equitable and sustainable exploitation/ utilization.

Learning Outcomes/Course Objectives

At the end of the course the student should be able to:

- Know the different types of natural resources of the Republic of South Sudan
- Discuss some of the problems pertinent to natural resources utilization
- Understand the most important concepts behind natural resource management and conservation.
- Demonstrate knowledge and understanding of a range of basic concepts and fundamental
- principles of agriculture, animal production, fisheries, forestry geology and wildlife.
- Demonstrate an understanding of the socioeconomic benefits and medicinal values of natural resources.
- Demonstrate an ability to work effectively with others.

Course Contents

1. **Agriculture:** Definition of agriculture, principles and practice, status of agriculture: staple crops, imports, exports; Institutional framework for the sector
   Crop Production: agronomy of important crops (field & horticultural crops),
   Soil Science: basics of soil fertility, soil characteristics of the six (6) agro-ecological zones;

Agricultural land use; Main farming systems used: traditional, irrigated, mechanize etc.
Types of crop cultivated: cereals, oil crops, legumes, horticultural crops etc.
Medicinal and aromatic plants: principles and practices, agronomy and phyto-chemistry, secondary metabolites (natural products), and ethnobotanical potential

2. **Animal Production**: Definition of animal production and animal products;
   Types of animal products:
   Poultry products (broilers and layers); meat (red and white meat); milk products (fresh milk, cheese, yogurt);
   Nutritional importance of livestock products;
   Zoonotic diseases of livestock; food borne diseases;
   Medicinal uses of livestock by-products;
   Contribution of livestock to the economy;
   Breeds of livestock in the Republic of South Sudan;
   Constraints of livestock production in South Sudan.

3. **Fisheries**: Fishery sciences definition, definition of fish;
   Capture fisheries: catch profile, role and importance of fisheries;
   Nutritional and medicinal importance of fish;
   Natural environment: lakes, rivers etc.
   Aquaculture: definition,
   C classification: based on intensity, types of environment, species farm;
   Aquaculture production systems;
   Fish technology: definition, fish utilization; common fishing gears and crafts;
   Constraints of fisheries sector.

4. **Forestry:** Definition: forestry, afforestation, deforestation, and reforestation;
   Forest types; forest uses;
   Importance of forest ecosystems;
   Threats to forest in the Republic of South Sudan: fires, illegal activities, politics/civil strife, lack of reforestation plan;
   Health problems in forests;
   Forest products with health promoting and medicinal properties: honey, walnut, pine resin, chios mastic gum.
   Bio-piracy;
   Alien and invasive species.
   Forest management and conservation.
5. **Geology:** Definition of geology; geology of the Republic of South Sudan;
   Minerals of South Sudan;
   Impact of exploration and exploitation;
   Soil as a source of dust and implications for human health;
   Water hardness and health effects;
   Volcanic emissions and health; Human geography: benefits and banes.
6. **Wildlife:** Definition of wildlife science;
   Importance of wildlife conservation;
   Wildlife management; values of wildlife: economic, medical and scientific, aesthetic and recreational, ecological etc.
   Zoonosis of wildlife;
   Zootherapy and its sustainability;
   Wildlife protected areas of South Sudan;

Endangered species in South Sudan.

Methodology

The teaching includes lectures, and group tuition (seminars).An emphasis is placed on problem-solving.

Recommended Text Books

Agriculture

1. Kokwaro, J. O. (1976). Medicinal Plants of East Africa. Eastern African Literature Bureau, Printed and Bound by General Printer Ltd, Homa Bay Road, P.O. Box 18001, Nairobi, Kenya.

2. AfDB 2013. South Sudan infrastructure action plan, chapter 6: development of agriculture in the Republic of South Sudan.

Animal Production

1. Chandan, R.C. (2007) Cheese varieties made by direct acidification of hot milk. In: (Eds.) Handbook of Food Products Manufacturing Principles, Bakery, Beverages, Cereals, Confectionary, Fats, Fruits, and Functional Foods. John Wiley and Interscience, New York, USA: 1:635-650

2. Fox, P.F., and Mcsweeney P.L.H. (1998). Dairy chemistry and biochemistry. Blackie Academic & Professional, London, UK

3. Mahgoub, O., Kadim, I.T. and Webb, E. (2012). Goat meat production and quality. CAB International, Oxfordshire, UK

4. Rose, S.P, (1997). Principles of poultry science. CABI Publishing, Wallingford, UK

5. Said, R., Bryant, M.J and Msechu, J.K.K. (2003). The survival, growth and carcass characteristics of crossbred beef cattle in Tanzania. Trop. Anim. Hlth. Prod., 35:441-454

Fisheries

1. FAO 2014. Fishery and aquaculture country profile: Republic of South Sudan.

2. FAO 1995. Quality and quality changes in fresh fish.

3. Lekang, O. (2013). Aquaculture engineering, second edition, UK, John Wiley & Sons, Ltd.

4. Sandon, H. (1950). An illustrated guide to freshwater fishes of the Sudan.

5. Ullah, S. and Ahmad, T. (2014). Nutritional and medical importance of fish: a mini review.

Forestry

1. Forest, trees and human health (2011).

2. Forest and human health: assessing the evidence (2006).

3. Evans J (2001). Forest handbook, vol.1

Geology

1. Selinus O, Alloway, BJ, Centeno JA, Finkelman RB, Fuge R, Lindh U, SmedleyP. (2005). Essentials of medical geology; impacts of the natural environment on public health, USA, Elsevier Academic Press.

2. Whiteman AJ. (1971). the geology of the Republic of Sudan Republic.

Wildlife

1. Huffman JE, Wallace JR, (2011). Wildlife forensics: methods and applications, 1st edition

2. Sinclair ARE, Fryxell JM, Caughley G. (2006). Wildlife ecology, conservation and management, 2nd edition.

SOUTH SUDAN STUDIES II (Socio-political Economy)

Course description

Socio-political economy of South Sudan is a multidisciplinary course that introduces students to contemporary development issues in the Republic South Sudan... This course is composed of many disciplines, law, geography, rural development, demography, education, economy and political sciences.

Course Aim

This course aims to explore the challenges of development, which remain a thorny issue to the progress of the country

Learning Outcomes/Course Objectives

At the end of the course the student should be able to:

1. Know some aspects the Republic of South Sudan laws, geography, rural development, demography, history, education, economy and political sciences.

2. Know the functions and the importance of all the components of this section of South Sudan studies.

3. Relate the different components of this course and examine them in the light of our diverse cultural setups.

4. Demonstrate how the knowledge that is obtained in this section furnishes will contribute towards cultural existence.

5. Discuss the inherent problems that are frequently occurring among rural settlers and to put them in a bird's eye of the focus of the course

6. Analyse the socio-political economy of the country in a broader sense.

7. Demonstrate an understanding and knowledge of how the country's socio-political economic system operates.

8. Relate the knowledge obtained at the end of this course to the overall functions and performance of political system in the country.

Course Content

Law

1. Definition of law; history of law;
2. Functions of law;
3. Classification of law;
4. Sources of law;
5. The fundamental areas of law;
6. Law and morality;
7. Principles of law;
8. Hierarchy of courts in the Republic of South Sudan;
9. Types of government systems in the Republic of South Sudan;
10. Human rights,
11. Law and medicine.

Geography

1. Definition of geography;
2. Overview of South Sudan geography;
3. Climate;
4. Landforms and topography;
5. Demographic situation:
6. Population,
7. Urbanization;
8. Vegetation zones: wetland, flood plains, savanna, subtropical low land, mountain ranges.

Rural Development

1. Definitions: rural, development and rural development;
2. Objectives of rural development;
3. Basic elements of rural development;
4. Characteristics of rural communities;
5. Types of rural settlement;
6. Conflicts among rural settlers;
7. Difference between development and economic growth;
8. Theories of rural development.

Demography

1. Definition of Demography;
2. Why study Demography?
3. Demographic perspectives:
4. Demographic of birth and death;
5. Demographic and social change;
6. Population size, distribution and concentration;
7. Age and sex composition;
8. Demographic processes: fertility, mortality, migration;
9. Population pyramids.

Education

1. Definition of education;
2. Functions of education;
3. Brief history of South Sudan education;
4. Classification of educational systems;
5. Missionary education in South Sudan 1900 – 1926;
6. The colonial and missionary education in South Sudan 1927 – 1953;
7. Sudanese nationalism and educational development in South Sudan 1948 – 1953;
8. Education in South Sudan; Education policy and practice.

South Sudan Economy

1. Background of South Sudan economy: independence time plus economic activities, human resources and their main economic activities, natural resources of economic value in the country.

2. The economic system: capitalism, socialist system (communism), mixed economic system.

3. The political setup and how resources are distributed in the country (production).

4. The economic potentials of South Sudan: land size, fertile land, manpower, water, mineral etc.

5. South Sudan external economic relations and its participation in WTO, IMF, World Bank, EAC etc.

6. South Sudan economic performance (measurement): agricultural product, oil industry, manufacturing, size of GDP, balance of payments over time (2011 – 2019).

7. Preservation of SSD national existence: societal security and governance, national cohesion, inflation rate, unemployment rate, poverty and its level.

Political sciences

1. Introduction to political science.
2. Power, authority, the state: Politics and the state
3. Political power;
4. Authority and state.
5. Democracy, freedom:
6. Democracy and our relationship to the state;
7. Freedom and justice. Political ideologies:
8. Traditional and western ideologies;
9. Alternative to mainstream western ideology.
10. Political parties, elections:
11. Voting, elections and political parties;
12. Civil society, interest groups and the media.
13. Political culture. International relations (basics):
14. Sovereignty, the state and international order;
15. Traditional theories of international relations.
16. International organizations.
17. International political economy.

Methodology

The teaching includes lectures, and group tuition (seminars).An emphasis is placed on problem-solving.

Recommended Text Books:

Demography

1. Bouvier, L, F., and Poston, D, L. (2010). Population and society: an introduction to demography, USA, Cambridge University Press.

2. Thomas, R, K. (2018). Concepts, methods and practical applications in applied demography: an introductory textbook, Switzerland, Springer International Publishing

Other references will be provided by the respective lecturers

14.2. Pre-Clinical Subjects/Courses: Semester II (1st Year), III, IV(2nd Year) & V(3rd yr)

Courses to be taught: Human Anatomy, Medical Biochemistry and Molecular Biology, Medical Physiology and Community Medicine

Credit hours: 76

Contact hours: 615

Practicals: 1,575

(1) Course title: Human Anatomy (GROSS ANATOMY, EMBRYOLOGY, HISTOLOGY, AND CLINICAL ANATOMY)

Credit hours: 19
Contact hours: 75
Practicals & Tutorials: 630

When taught: Integrated Core Basic Science Course (I, II, III, and IV): 3rd and 4nd Semesters

First Year: **Semester II**: Introduction to anatomy: Gross anatomy, upper and lower limb, general embryology and general histology

Second Year: **Semester III**: Gross anatomy: Thorax, systemic embryology and histology
Semester IV: Gross anatomy: Abdomen, Pelvis, systemic embryology and histology

Third Year: **Semester V**: Gross anatomy of head and neck and Neuroanatomy

Course description

Prerequisite knowledge of the anatomical structure of the human body is a foundation for learning other basic sciences as a prelude clinical learning. The key concepts of the gross human anatomy will be learnt through IT textbooks, lectures and radiologic sessions.

This course introduces general principles of human anatomy and topographical anatomy of the regions of the body: limbs, thorax, abdomen, pelvis, head and neck. Functional and applied aspects of anatomy will also be learnt.

Human embryology is designed to provide the student with an introduction to the mechanisms of development, growth and differentiation of the early human being will be taught in embryology. Development of the organ systems and developmental anomalies will also be studied in embryology.

During the histology sessions the student shall learn about the cells of the body, tissues, organ systems as seen through the use of the light and electron microscopes. Histology gives the student an understanding of the microscopic organization of all the organ systems of the human body. Thereby the student understands the normal structure and relate with their derangement in the disease process.

Course aim

1. Impart knowledge on the anatomy of the human body by describing the body planes, body regions and their relationship to each other.
2. Know and identify the osteology of the human skeleton: the axial and appendicular forms. Identify and know the features of the bones of the skull, vertebral column, maxillofacial region, upper and lower limbs, thoracic cage, and the pectoral girdle.
3. .Appreciate the three-dimensional nature and the topographical relationship of the structures and functions of the human body.

4. To introduce the student to the use of anatomical knowledge as a tool for problem-solving in clinical scenarios and other applied situations.

Learning outcomes/Course Objectives

At the end of the course the student should be able to:

1. Communicate using the correct anatomical terms.
2. Relate anatomical structure to function
3. Know the relationship of the structure of the anatomy to its function.
4. Define and demonstrate the anatomical position in relation to the position of the body structures and movement of the joints.
5. Describe the general features of the skeleton, the regions and systems of the body.
6. Identify, the bones, major muscles, nerves, and blood vessels, lymph node groups on the cadaver or manikins. Relate them to their function, histology and embryology.
7. Visualize the structural relationship in three dimensions with awareness of body symmetry as well as anatomical variation.
8. Formulate diagnoses on anatomical basis.
9. Describe the general features of the parts of the skeleton, regions of the body and systems of the body
10. Identify on the cadaver or models the bones, major muscles, nerve, blood vessels, lymph node groups and relate them to their function, histology and embryology.
11. Interpret normal anatomy on radiographs: plain radiographs, CT scans, MRI images.
12. Solve clinical cases with an anatomical basis
13. Outline the mechanisms of development, growth and differentiation of the human organism.
14. Describe the normal and anomalous development of the organ systems.

Course Competencies

On successful completion of this course/module the student should be able to:

1. Define the anatomical position of body structures, using common terminologies in relation to their positions and joints movement.
2. Demonstrate the anatomical position using common terms to denote relative position of the body structures and joints movement.
3. Describe the general features of the skeleton, regions and systems of the human body.
4. Using manikins/models identify the bones, major muscles, nerves, blood vessels, lymph node groups and relate them to their embryology, histology and function .
5. Demonstrate, by inspection and palpation of a live body, the position and relationships of all major structures and bony prominences
6. Interpret anatomical features of the regions of the body on radiographs.
7. Describe the effect of injury/ dysfunction of the above structures.
8. Describe microscopic structure in relation to function.
9. Identify, using microscopic slides, normal tissues and organs.
10. Describe the normal development of the human organ systems correlating their development with their microscopic and gross structure.
11. Explain how developmental anomalies and malformations occur.
12. Describe male and female gametogenesis.
13. Describe the developmental changes from fertilization to birth.
14. State the principles of teratology.
15. Identify the anatomical basis for formulating a diagnosis/ intervention in a clinical setting.
16. Demonstrate the application of the knowledge of anatomy in clinical practice or performing procedures.
17. Describe the relevant anatomy of disordered structures and function in clinical practice.
18. Show ability to integrate knowledge of developmental, microscopic and gross, anatomy as a basis for future clinical studies and practice.
19. State the principles of teratology.
20. Identify the anatomical basis for diagnosis and intervention in a given clinical scenario.
21. Demonstrate the application of anatomical facts in carrying out clinical procedures.
22. Describe the relevant anatomy of disordered structure and function in common clinical conditions.

23. Show ability to integrate knowledge of gross, microscopic and developmental anatomy as a basis for future clinical studies.

24. Describe the general features of the parts of the skeleton, regions of the body, and systems of the human and relate them to their function, histology and embryology.

25. Identify on the cadaver or models, the bones, major muscles, nerves, blood vessels, lymph node groups

26. Demonstrate by inspection and palpation on the living body the position and relationships of all major bony structures.

27. Interpret anatomical appearances in radiographs of the region studied.

28. Describe in simple terms the effect of injury to or dysfunction of the above structures.

29. Describe microscopic structure in relation to function.

30. Identify normal tissues and organs by carrying out a systematic examination of prepared microscopic slides.

31. Describe the normal development of all the major human organ systems and correlate this with their gross and microscopic structure.

Course Content:

Gross Anatomy - Principles of Anatomy

1**. Methods of study**: anatomical position and descriptive nomenclature; bones and joints; muscles, tendons and fasciae; blood vessels and lymphatics; nerves: spinal cord and typical spinal nerve; skin and appendages; disposition of viscera and serous cavities.

2. Regional Dissection

1. Dissection of the upper limb, lower limb, superficial thoracic wall, breast, axilla, muscles, vessels, lymph nodes, nerves, bones and joints; applied anatomy.
2. Thoracic cage: vertebrae, sternum, ribs, intercostal muscles, vessels and nerves.
3. Thoracic viscera: heart, lungs, trachea, esophagus, arteries, veins, nerves, lymph nodes.
4. Abdominal wall: muscles, vessels, inguinal canal and hernia.
5. Abdominal viscera: stomach, intestines, liver, gall bladder, pancreas, spleen, kidney and ureters, vessels and lymph nodes.
6. Pelvis and perineum: male and female bony pelvis; urinary bladder, rectum, uterus, fallopian tubes and ovaries; prostate and seminal vesicles; and canal, external genitalia.
7. Head and neck
8. Neuroanatom

Embryology

1. Gametogenesis: oogenesis, spermatogenesis,
2. Fertilization
3. Cleavage and transport of the conceptus: blastocyst formation and implantation.
4. Formation of germ layers (gastrulation) and early development: formation of amnion, yolk sac, and bilaminar embryonic disc; primary germ layers; formation of prelaminar disc.
5. Derivatives of germ layers and establishment of body form: derivatives of ectoderm, mesoderm and endoderm; formation of head, tail and lateral body folds.
6. Development of fetal membranes and the placenta: amnion, chorion, yolk sac and allantois; formation and structure of the placenta; umbilical cord and placental circulation; functions of the placenta; multiple births and their membrane relationships.
7. Teratology: congenital malformations and their causes; incidence of malformations; aetiology: chromosomal and environmental factors.
8. Skeletal system and ossification: intramembranous and endochondral ossification; skull, vertebral column, sternum, appendicular skeleton; teeth; congenital malformations.
9. Muscular and integumentary systems: skeletal and smooth musculature; skin and appendages; mammary gland.

10. Branchial arches and face: components of branchial arches; branchial clefts and pouches; ectoderm, mesoderm and endoderm derivatives; mouth, palate and face; developmental anomalies of the branchial region.
11. The heart and blood vascular system: early development of the heart and primitive circulation; later development of the heart and partitioning of the heart; development of the great vessels; fetal circulation and postnatal changes; anomalies of the cardiovascular system.
12. Urogenital system: pronephros, mesonephros and metanephros; cloaca, urinary bladder and urethra; suprarenal gland; gonads and genital ducts, differentiation of sex; external genitalia; anomalies.
13. Nervous system: neurulation and histogenesis of the neural tube; neural crest; cell groups in the spinal cord and brainstem; cranial nerve nuclei; development of the brain, eye, ear; anomalies.
14. Colon, lungs, diaphragm: septum transversum; air passages and lungs; diaphragm; anomalies.
15. Alimentary system: foregut and its derivatives, including spleen; midgut and rotation of the gut loop; hindgut; anomalies.
16. Head and Neck: maxillofacial, oral cavity, facial bones, muscles of mastication, muscles on the chest ,clavicle, sinuses, orbits, orbital muscles, globe of the eye blood vessels, nerves, lymph nodes, nasal cavities, cranial cavity, neuro-anatomy, contents of the cranial cavity, brain, meninges, arachnoids.

Histology

1. Introduction - light microscopy and histological techniques.
2. The Cell - membrane systems and organelles; cell division.
3. Epithelia - membranes and surface specialisations; exocrine glands.
4. Connective tissue I - CT proper: fibres, CT cells, intercellular substance.
5. Connective tissue II - cartilage and bone.
6. Connective tissue III - ossification and bone repair.
7. Connective tissue IV - blood and bone marrow; haematopoiesis.
8. Muscle tissue - smooth, cardiac, and skeletal muscle.
9. Nerve tissue - nerve cell bodies, axons and dendrites, myelination, peripheral nerves and ganglia.
10. Blood vascular system: heart, arteries, veins, lymphatics.
11. Immune system: thymus, spleen, lymph node, tonsil.
12. Integumentary system: skin, hair and nails, sebaceous and sweat glands, sensory receptors
13. Respiratory system: nose, larynx, air passages, lungs.
14. Alimentary system: oral cavity, esophagus, stomach, small intestine, large intestine; liver, gall bladder, pancreas.
15. Urinary system: kidney, ureter, urinary bladder.
16. Male reproductive system: testis, vas deferens, seminal vesicle, prostate, urethra, penis.
17. Female reproductive system: ovary, fallopian tube, uterus, vagina.
18. Endocrine system: pituitary, thyroid, parathyroid, suprarenal, endocrine pancreas, pineal.
19. Special sense organs: eye and ear.
20. Central nervous system: spinal cord, cerebral and cerebellar cortex.

CLINICAL AND APPLIED ANATOMY

1. Upper Limb

Anatomical principles applied to shoulder dislocation/injury.
Anatomical principles applied to fractures of the radius, ulna and phalanges
Anatomical principles applied to hand Infections (palmar spaces).

2. Lower Limb

Anatomical principles applied to injury vascular and nervous systems of the lower limb
Anatomical principles applied to fractures of the femur, tibia, fibula, tarsals, and metatarsals
Anatomical principles applied to the lower limb fascial spaces
Anatomical principles of joints and dislocations of the lower limb
Anatomical principles of fascial spaces infections

3. Pelvis

4. Head and Neck

Surface anatomy of the head and neck and spine organs.
Radiological anatomy of the head and neck
Radiological anatomy of the GIT.
Anatomical principles applied to radiological anatomy of the head and neck
Vertebral bones, spine injury
Anatomical principles applied to injury/fractures of the cranium and contents
Fractures of the oral and maxillofacial region

5. Thorax

Surface anatomy of the thoracic organs.
Anatomical principles applied to intercostal drainage of fluids and air.
Anatomical principles applied to pulmonary diseases (pneumonia, TB, lung tumors).
Anatomical principles applied myocardial infarction and congenital heart disease.
Radiological anatomy of the lungs and heart.

6. Abdomen

Anterior and posterior surface anatomy of the abdominal organs.
Anatomical principles applied to inguinal hernias.
Anatomical principles applied to intestinal obstruction.
Anatomical principles applied to radiological anatomy of the renal system.
Radiological Anatomy of the GIT.

The Republic of South Sudan MBBS programme applies a competency- based curriculum to produce a competent and reflective doctor. The students are trained using the SPICES model based on small group teaching. Promoting ICT resources in teaching and learning

Teaching Methods

Tutorials
Lectures
Technology based: web/ICT learning.
Small group teaching,
Integrated teaching

Community-based education
Lectures - 2 hours per week
Practical - 6 hours per week
Seminars - 6 hours per week
Tutorials - 1 hour per week

Assessment Methods

Formative: Viva voce
Feedback
Practical, short answer questions
Portfolio/log book
Self-assessment
Peer-assessment
Tutor assessment

Continuous assessment: 40%

Assignments:	10%
Written tests (2):	20%
Practical:	10%

Summative

Final examination:

Written examination:	**60%**
Paper I (MCQ):	20%.
Paper II (Essays):	25%
Practical:	10%
Viva Voce:	5%

Recommended Text Books

Histology

1. Junqueira LC, Carneiro J & Kelly R (1992), Basic Histology, 7th edition (or later) Prentice Hall/Lange.
2. Tallitsch RB, Guastaferii R (2009). Histology: Identification Manual, Mosby/Elsevier.
3. Eroschenko VP (1996). Difiore's Atlas of Histology, 8th Ed. (or later) Lippincott Williams & Wilkins.
4. Young B, Lowe JS, Stevens A & Heath JW (2006). Wheater's Functional Histology, 5th Ed, Churchill Livingstone/Elsev

Embryology

1. Sadler TW (2005). Langman's Medical Embryology, 9th Ed, Lippincott Williams & Wilkins.
2. Moore KL & Persaud TVN (2003). The Developing Human, 7th Ed, Saunders/Elsevier

Gross Anatomy

1. Zuckerman S (1981). A New System of Anatomy, 2nd ed. Oxford Medical publications.
2. Tank PW (2009). Grant's Dissector, 14th ed. Walter Kluwer/Lippincott Williams & Wilkins.
3. Drake R, Vogl W & Mitchell AWM (2005). Gray's Anatomy for Students, Churchill.
4. Standring S (2004), Gray's Anatomy, 39th ed. Churchill Livingstone/Elsevier.

Journals

1. Livingstone/Elsevier Journals (To be advised by lecturers in charge). Websites (To be advised by lecturers in charge)

(2)Course title: Medical Biochemistry and Molecular Biology

Credit hours: 24
Contact hours: 210
Practicals & Tutorials: 450

Course description:

The proposed curriculum was designed so as to follow & cope the evolution progress which has occurred in recent years in the field of biochemistry & molecular medicine also the new curriculum has considered the applied part of biochemistry & its integration with clinical science & Para clinical science so that the integrated lectures will be conducted within the syllabus of biochemistry with collaboration with other departments such medicine, pathology, pediatrics and pharmacology.

The curriculum will be studied as part of the basic medical sciences on 4 semesters (SII, III, IV & V)

First year, Semester II

Biochemistry 1

Introduction to medical biochemistry

Objectives

By the end of this term the student should be able to:

Define the basic principles of organic chemistry.

Learn the concept of acid- base regulation; know the techniques for pH measurement and the significance of buffering in biological systems.

Describe the chemical structure of carbohydrates, lipids, proteins, enzymes, co-enzymes, vitamins, nucleic acid, genes, chromatin and chromosomes.

Illustrate these chemical structures in three dimensions with the relevant properties of the main chemical groups.

List the specificities and catalytic power of enzymes, understand the mechanisms of their actions and identify factors that affect their activity.

- Know the biological and biochemical roles of vitamins
- Illustrate the role of DNA, m RNA, gene and protein synthesis.
- Know the principles and applications of different biochemical techniques used in biological research.

Specific objectives

By the end of this semester student should cover the following topics

1. The cell: An overall view about living cell and organelles.
2. Organic chemistry: Review of basic organic chemistry.
3. Carbohydrates: Definition, chemistry, importance, classification (e.g. mono and disaccharides), important disaccharides and polysaccharides.
4. Lipids: Definition, importance, Classification (Simple or storage form and complex or structural form), derived lipids with specific biological activity.
5. Fatty acids: definition, nomenclature, saturated/ unsaturated and physical properties. Triacyleglycerol; importance and physical properties.
6. Protein: Chemical structure, different levels of protein structures and types. Blood protein; hemoglobin structure/ function and abnormalities, serum proteins; albumin, globulin, immunoglobulin and blood clotting proteins.
7. Biochemical techniques: Principal and applications of dialysis, centrifugation, chromatography, electrophoresis, gel filtration, colorimeter and immunological and molecular techniques.
8. Nucleic acid: Definition, chemistry, DNA, RNA, nucleotides structure (Sugar, purine/ pyrimidine bases and phosphate) importance in energy
9. Basic principles of DNA (Watson and Crick model), comparison of DNA and RNA, structure and polymerization and genetic code.
10. Vitamins: Chemistry, sources, active form (co- enzyme) and deficiency.
11. Enzymes: Structure, catalytic properties, specificity and allosteric enzymes, Enzymes classification, kinetics, clinical enzymology e.g. lactate dehydrogenase.

Second Year, Semester III &IV:
Biochemistry II

Objectives:

By the end of this course the student should:

- Be able to know all types of dietary sources (carbohydrates, lipid and proteins) as well their digestion and absorption.
- Know how fuel molecules are oxidized in cell to produce energy and how are they synthesized from amphibolic intermediates.

- Know how the body utilizes various sources of energy under different physiological (e.g. fed and fasting) & pathological situations
- Enumerate abnormalities associated with synthesis and degradation of bio- molecules.
- Know synthesis and degradation of building blocks of nucleic acid, DNA organization & replication, RNA transcription & alternations, protein synthesis and different types of mutations.

Specific objective:

By the end of this semester student should cover the following topics:

1-Carbohydrates utilization: Digestion and absorption, metabolism (including glycolysis, citric acid cycle, electron transport chain, pentose phosphate pathway glycogenesis, glycogenolysis, gluconeogenesis. Glycogenesis (storage disorders). Fructose and galactose metabolism and associated metabolic disorders

2-Lipids Utilization: Digestion and absorption, metabolism (including fatty acid oxidation and synthesis, ketone bodies production and utilization, triacyleglycerol (TAG) and glycolipids synthesis and cholesterol synthesis) lipid transport in body fluids (Lipoproteins) and associated metabolic disorders.

3-Amino acids (aa) Utilization: Digestion and absorption, metabolism of aa (including transamination, Oxidatative deamination, urea synthesis and associated disorders, catabolism of carbon skeleton of the standard aa (all 20aa), synthesis of non- essential aa, synthesis of non- specialized proteins from aa e.g. heme synthesis & degradation) and inborn errors of aa metabolism.

4-Nucleotides: Synthesis and degradation and associated disorders.

5-DNA: replication, RNA transcription and translation.

6-Protein biosynthesis: genetic code, post- transcription modification and mutations.

Third year, semester V

Biochemistry III

Objectives:

By the end of this semester the student should:

Know the integration and hormonal regulation of metabolism and involvement of the major organs; the liver, adipose tissue, cardiac and skeletal muscles, brain, kidney and the blood. Also students should be aware of the major classes of hormones and mechanism of signal transduction and diabetes mellitus as an example of metabolic derangement.

List the mechanisms of regulation of gene expression and principles of gene manipulation
Know the molecular basis of immunology; cancer biochemistry metabolism of xenobiotics and major concept of nutrition and mineral metabolism and clinical cases in biochemistry.

Specific objective:

By the end of this semester student should cover the following topics:

1. Integration and hormonal regulation of metabolism including:
2. Strategy of metabolism, recurring motives of control, control of major catabolic pathways and key junction of different metabolic pathways.

3. The metabolic role of liver, adipose tissue, skeletal and cardiac muscle, brain, kidney and the blood in the intermediary metabolism.
4. Metabolic abnormalities (diabetes mellitus).
5. Major classes of hormones involved in metabolism (insulin, glucagon and epinephrine).
6. Mechanisms of hormonal action (Signal transduction).
7. Immunochemistry:
8. Introduction of the immune system.
9. Immunoglobulin structure and function.
10. T- cell receptors and major histocompatability complex molecule.
11. Diversity of immunoglobulin and T- cell receptor.
12. Complements and complement pathways and cytokines.
13. Cellular and molecular cooperation of the immune response.
14. Control of gene expression.
15. Recombinant DNA technology.
16. Cancer biochemistry.
17. Detoxification and metabolism of xenobiotics.
18. Biochemistry of muscle contraction.
19. Plasma proteins.
20. Principles of nutrition and mineral metabolism.

Teaching/Training Methods

Lectures
Tutorials
Laboratory Practical

Assessment Methods:

Continuous assessment -	**40%**
Continuous assessment Tests -	35%
Laboratory/practical reports -	5%
Final Examination	**60%**
Written examination	
Paper 1 - Essays and short notes-	20%
Paper 2 -Multiple choice questions-	30%
Final Oral examination -	10%

Recommended Text Books

1. Lehninger, A.L., Nelson, D.L., and Cox M.M. (2008) Principles of Biochemistry. Worth Publishers, New York. ISBN 0-87901-500-4.
2. Martin, D.W., Hayes, P.A., and Rowell, V.M. (1991). Harper's review of Biochemistry. Lange Medical Publications, California. ISBN: 0-87041-036-9
3. Thomas M. Devlin (2002). Textbook of Biochemistry with Clinical Correlations. Willey Liss Publishers. ISBN-13:978-0-7167-8724-2.
4. Stryer, L. 2006. Biochemistry. W.H. Freeman and Co., San Francisco

(3)Course title: Medical Physiology

Credit hours: 23
Contact hours: 210
Practical/Clinical Round: 405

Broad Objective: Integrated Core Basic Science Course
When taught:
Introductory Physiology: Year1: Semester II
Integrated Core Basic Science Course I: Year 2: Semester III
Integrated Core Basic Science Course II: Year 2: Semester IV
Clinical Application Basic Science Course III: Year 3: Semester V
Revision of Core Basic Sciences Course IV: Year 3: Semester V

Introduction

The course is on Basic and Applied Physiology.

1. Enables the student to have an integrated understanding of physiology at the molecular, cellular and organ levels.
2. An understanding of the structure and function of molecules, cells, organs and organ systems.
3. Understand the functioning of the human body in health and disease.
4. Impart the students with essential knowledge on the integrative mechanisms that exists between systems.
5. An understanding of the structure and function of the cells, physiology of nerve and muscle, synaptic and junctional transmission, and function of blood and lymph.
6. An understanding of the normal function of the body systems: the gastro-intestinal, cardiovascular system, the respiratory system, urinary system, endocrine system, and the central nervous system.
7. Basic and Applied Physiology imparts understanding of the integrated knowledge of the human body from the level of molecules, cells and organs.
8. Basic and Applied Physiology imparts understanding of the integrated knowledge of the human body from the level of molecules, cells and organs.
9. An understanding of the structure and function of cells, organs and organ systems and the integrative mechanisms that exists between systems.

Course Aim

To enable students to have knowledge of the functioning of the human body at the molecular, cellular and organ systems level and be able to apply this knowledge in clinical practice.

Learning Outcomes/ Course Objectives

At the end of the course the students should be able to:

1. Describe aspects of cellular and molecular physiology.
2. Name the various parts of the nerves and the functions, and describe transmission at synapses.
3. Define and discuss the importance of homeostasis.
4. Describe the various parts of the nerves and the functions, and transmission at synapses.
5. Discuss the morphological and functional characteristics of the different types of muscles.
6. Describe the structure and function of the conduction system of the heart including recording and interpretation of the electrocardiogram (ECG).
7. Describe the relationship between flow, pressure and resistance in the vascular system.
8. Describe the autonomic system and its role in the physiologic regulation of the cardiovascular system
9. Define shock and its major causes.
10. Define features and causes of hypertension and cardiac failure.
11. Describe and compare the pulmonary and systemic circulations.
12. Describe gas transportation, regulation of respiration and respiratory adjustments in health and disease.
13. Describe the structure and function of a nephron and renal blood supply.
14. Describe the assessment of renal function.
15. Explain the tubular handling of various substances in terms of filtration, reabsorption and secretion.

16. Outline the effects of hormones on different organs.
17. Describe the mechanisms that regulate hormonal secretion.
18. Describe features of the diseases caused by excess or deficiency of each hormone.
19. Discuss the morphological and functional characteristics of the different types of muscles.
20. Describe the structure and function of the conduction system of the heart, recording and Interpretation of the electrocardiogram (ECG).
21. Describe the relationship between flow, pressure and resistance in the vascular system.
22. Describe the autonomic nervous system and its role in the physiologic regulation of the cardiovascular system.
23. Define features and causes of hypertension and cardiac failure.
24. Describe and compare the pulmonary and systemic circulations.
25. Describe gas transportation, regulation of respiration and respiratory adjustments in health and disease.
26. Describe the structure and function of a nephron and renal blood supply.
27. Describe the assessment of renal function.
28. Explain the tubular handling of various substances in terms of filtration, reabsorption and secretion.
29. Outline the effects of hormones on different organs.
30. Describe the mechanisms that regulate hormonal secretion.
31. Describe features of the diseases caused by excess or deficiency of each hormone
32. Define common terms in blood physiology
33. Discuss the various constituents and their interrelationships in blood physiology.
34. Describe the roles and functions of blood constituents in health and disease.
35. Define homeostasis and its mechanisms of maintenance.
36. Describe the role of the immune system and its constituents in health and disease.
37. Discuss the functional cycles of the heart in health and disease
38. Interpret investigative findings of the heart in health and disease.
39. Describe the regulatory mechanisms of the heart in health and disease.
40. Elucidate the functions of each part of the gastrointestinal system.
41. Describe the roles of the nervous system and hepatobiliary systems in the GIT system.
42. Discuss the functions of the parts of the respiratory system
43. Demonstrate proficiency in identifying the mechanisms of disease by the constituent parts of the respiratory system.
44. Interpret results of investigations of respiratory function in health and disease.
45. Describe the structure and function of a nephron and renal blood supply.
46. Describe the assessment of renal function.
47. Explain the tubular handling of various substances in terms of filtration, reabsorption and secretion.
48. Outline the effects of hormones on different organs.
49. Describe the mechanisms that regulate hormonal secretion.
50. Describe features of the diseases caused by excess or deficiency of each hormone.

Course Content:

Unit I- General and cellular basis of medical physiology

1. **Cellular Physiology:**

1.1 History, goal and objectives

1.2 Body fluids Compartments

1.3 Homeostasis and feedback systems.

1.4 Functional morphology of the cell and cell membrane:

1.5 Membrane proteins; types and function

1.6 Transport across cell membrane

1.7 The capillary wall

1.8 Intracellular communication

1.9 The Role of Calcium in Nerve Excitation**.**

Physiology of Nerve and Muscle Cells:

2.1 Cellular elements in the CNS

2.2 Excitation and Conduction

2.3 Resting Membrane Potential and Action Potential

2.4 All or none law

2.5 Nerve Fiber Types

2.6 Neurotrophins

2.7 Morphology of Skeletal Muscle (Muscle proteins, striation and sarcotubular system)

2.8 Contractile Responses and Muscular Excitation

2.9 Properties of Skeletal Muscle

2.10 Morphology and properties of Cardiac Muscle

2.11 Morphology and properties of Smooth Muscle

2.12 Synaptic Transmission

2.13 Inhibition and Facilitation at Synapses

2.14 Neuromuscular junction.

2.15 Nerve Endings in Smooth and Cardiac Muscles

Unit II: Systemic Physiology

3. Cardiovascular System Physiology:

3.1 Cardiac structure and function

3.2 Basic properties of the cardiac muscle

3.3 Origin and Spread of Cardiac Excitation

3.4 Electrocardiogram

3.5 Cardiac Arrhythmias

3.6 The cardiac cycle

3.7 The cardiac output and its control

3.8 Composition and Function of Blood

3.9 Blood Types and groups

3.10 Hemostasis; Coagulation, Fibrinolysis and Bleeding Disorders

3.11 Structural Features of the Circulation

3.12 Biophysical Considerations for Circulatory Physiology

3.13 Arterial, Arteriolar and Capillary Circulation

3.14 Lymphatic Circulation and Interstitial Fluid Volume

3.15 Neural Control of the Cardiovascular System

3.16 Hormonal Control of the Cardiovascular System

3.17 Circulation through Special Regions

4. Gastrointestinal Physiology:

4.1 Structural organization of GIT

4.2 Gastrointestinal Secretions

4.3 Gastrointestinal regulation

4.4 Gastrointestinal Peptides

4.5 The Enteric Nervous system

4.6 The Splanchnic Circulation

4.7 Digestion and Absorption

4.8 Nutritional Principles and Energy Metabolism

4.9 Gastrointestinal Motility

4.10 Transport and Metabolic Functions of the Liver and the Biliary System

5. Physiology of the Renal System:

5.1 Functional Anatomy of the Kidney

5.2 Renal Circulation

5.3 Glomerular Filtration

5.4 Clearance Concept

5.5 Tubular Function

5.6 The Countercurrent Mechanism

5.7 Regulation of Sodium Excretion

5.8 Regulation of Water Excretion

5.9 Regulation of Potassium Excretion

5.10 Urinary concentration and dilution

5.11 Effects of Disordered Renal Function

5.12 Physiology of Urinary Bladder

5.13 Regulation of Extracellular Fluid Composition & Volume

5.14 Acidification of the Urine and Bicarbonate Excretion

6. Physiology of the Respiratory System:

6.1 Anatomy of the Lungs

6.2 Properties of Gases

6.3 Mechanics of Respiration

6.4 Lung Volumes and capacities.

6.5 Gas Exchange in the Lung

6.6 Alveolar gas exchange

6.7 Physics of diffusion and partial pressure

6.8 Pulmonary circulation

6.9 Ventilation - Perfusion Relationship

6.10 Transport of oxygen in the blood

6.11 Oxygen - Hemoglobin Dissociation Curve

6.12 Carbon Dioxide Transport in the blood

6.13 Acidosis and Alkalosis

6.14 Hypoxia, Hypercapnia and Hypocapnia

6.15 Neural and Chemical Control of Breathing

6.16 Respiratory Abnormalities

7. Physiology of the Endocrine and Reproductive Systems:

7.1 The Thyroid Gland

7.2 Formation and Secretion of Thyroid Hormones

7.3 Transport and Metabolism of Thyroid Hormones

7.4 Regulation of Thyroid Secretion

7.5 Effects of Thyroid Hormones

7.6 Action of the thyroid hormone

7.7 Endocrine Functions of the Pancreas

7.8 Insulin Deficiency and Excess

7.9. Regulation of Insulin Secretion

7.10 Glucagon

7.11 Somatostatin

7.12 Diabetes Mellitus

7.13 The Adrenal Medulla and Adrenal Cortex

7.14 Regulation of Adrenal Medullary Secretion

7.15 Transport, Metabolism and Excretion of Adrenocortical Hormones

7.16 Physiologic Effects of Glucocorticoids

7.17 Pharmacologic and Pathologic Effects of Glucocorticoids

7.18 Regulation of Glucocorticoids Secretion

7.19 Effects of Mineralocorticoids

7.20 Regulation of Aldosterone Secretion

7.21 Calcium and Phosphorus Metabolism

7.22 Vitamin D metabolism

7.23 Parathyroid Hormones

7.24 Calcitonin and Bone Physiology

7.25 The Pituitary Gland and its Hormones

7.26 The Hypothalamic hormones and their functions

7.27 The Gonads and the Gonadal Hormones

7.28 The Male Reproductive System

7.29 The Female Reproductive System

Unit III- Neurophysiology/ Central and Peripheral:

8.1 Introduction to Neurophysiology

8.2 Development of the nervous system

8.3 Properties of Sensory Receptors

8.4 Reflexes

8.5 Neurotransmitters and Neuromodulators

8.6 Basic design of the Nervous System

8.7 Pain and Temperature

8.8 Classification of Pain

8.9 Somatosensory Pathways

8.10 Modulation of Pain Transmission

8.11 Anatomic Organization of the Autonomic Outflow

8.12 Chemical Transmission at Autonomic Junctions

8.13 Responses of Effector Organs to Autonomic Nerve Impulses

8.14 Enteric Nervous System

8.15 Hypothalamic Regulation of the Hormonal Functions

8.16 Control of Posterior Pituitary

8.17 Control of Anterior Pituitary

8.18 Control of Posture and Movement

8.19 Corticospinal and Corticobulbar Tracts

8.20 Motor Cortex and Voluntary Movement

8.21 Brain Stem Pathways involved in Posture and Voluntary Movement

8.22 Posture Regulating Systems

8.23 Spinal Integration

8.24 Basal Ganglia

8.25 Cerebellum

8.26 Cerebral Metabolism and Blood Flow

8.27 Cerebrospinal Fluid System

8.28 Neuroglial types and function

8.29 Blood- Brain Barrier

Unit IV: Physiology of Special Senses and Higher Centers:

9.1 Anatomic Consideration of the Visual System

9.2 The Image Forming Mechanism

9.3 Transduction in photoreceptors and photochemistry

9.4 Visual Acuity

9.5 Visual Fields

9.6 The Function of Lateral Geniculate Body

9.7 The Photoreceptor Mechanism

9.8 Responses in the Visual Pathways and Cortex

9.9 Color Vision

9.10 Other Aspects of Visual Function

9.11 Eye Movements

9.12 Anatomic Consideration of Hearing and Equilibrium

9.13 Physiology of Hearing

9.14 The Vestibular System

9.15 Hearing abnormalities

9.16 Audiometric tests

9.17 The sense of Smell

9.18 The Sense of Taste

9.19 The Thalamus, Cerebral Cortex and the Reticular Formation

9.20 The Reticular Activating System

9.21 Investigation the brain; Evoked Cortical Potentials

9.22 Physiologic Basis of Electroencephalogram

9.23 Sleep - Wake Cycle

9.24 Sleep stages and types

9.25 Circadian Rhythm

9. 26 Modulation of the level of consciousness

9.27 Epilepsy and Disturbance of Consciousness

9.28 The Limbic System, Amygdala and Hippocampus

9.29 Learning and Memory

Assessment Methods:

Continuous assessment -	**40%**
Continuous assessment Tests -	35%
Laboratory/practical reports -	5%
Final written examination -	**60%**
Paper 1- Essays and short notes-	30%
Paper 2 - Multiple choice questions-	20%
Final Oral examination -	10%

Formative: Mini project, literature review

Summative: Long essay questions, MCQ, short essay questions, mock examination

Recommended Textbooks

1. Ganong W.G. (2005). A Review of Medical Physiology. Lange Medical Publications California ISBN 007 – 144040-2.
2. Walter F.B., Boupaep E.L., (2009) Medical Physiology. Publishers Saunders/Elsevier. ISBN 978-1-4160-3115-4.
3. Guyton A.C and Hall J.E. (2006) Medical Physiology. ISBN 13.978-0-7216-0240-0.
4. Berne and Levy (2008) Physiology Publishers – Mosby/Elsevier. ISBN 978-0-323- 04582-7.

14.3. Para-Clinical Subjects/Courses: Semester VI (3rd yr), VII &VIII (4th yr)

Courses to be taught: Pathology, Medical Microbiology &Immunology, Clinical Pharmacology, Community Medicine, Introduction to Internal Medicine and Surgery

Credit hours: 69

Contact hours: 585

Practicals hours: 1,350

(1) Course title: Medical Microbiology & Immunology

(BACTERIOLOGY, PARASITOLOGY, MYCOLOGY, VIROLOGY, and IMMUNOLOGY)

Credit hours: 18
Contact hours: 165
Practicals / Clinical Round: 270

Introduction

The course introduces the student to the scientific basis of medical/clinical microbiology, and infectious diseases and infection control. The course provides the scientific basis for diseases caused by contagious micro-organisms: viruses, bacteria, fungi, parasites.

Course aim

1. To impart the students with knowledge, understanding and medical application of medical bacteriology, parasitology mycology, virology and immunology, highlighting bacteria, parasites, fungi and viruses of clinical importance. It also describes specific systemic bacterial, parasitic, fungal and viral infections, and their pathophysiology, diagnosis and treatment.
2. To impart the students with knowledge, ability to apply the practical laboratory skills of diagnosing and managing diseases caused by infectious microbiologic agents for use in clinical practice and at community level.

Course Objectives/Learning outcomes

At the end of the course, students should be able to:

1. Outline the different fungi / viruses and the diseases they cause.
2. Describe the pathogenic mechanisms of fungi and viruses.
3. Outline the epidemiology and control of diseases of national importance.
4. Identify fungi and viruses using various techniques.
5. Outline anti-microbial susceptibility and resistance, local resistance patterns, infection surveillance, prevention and epidemic preparedness.
6. Describe pathogenesis of diseases caused by microbiologic agents.
7. Know the basic mechanism of infection and molecular mechanism in the pathogenesis of diseases.
8. Analyse and interpret results of microbiological tests for use clinical practice.
9. Effectively communicate fundamental concepts of microbiology in written and oral format.
10. Properly collect, prepare and view specimens (blood, stool, culture etc.) in a microbiologic laboratory.
11. Use appropriate methods to identify microorganisms (media-based, molecular, and serological).
12. Use appropriate microbiological and molecular lab equipment and methods.
13. Practice safe microbiology, using appropriate protective and emergency procedures.
14. Document and report on experimental protocols, results and conclusions.

Learning outcomes/Course Competencies

1. Demonstrate knowledge and skills in identifying viruses of medical significance.
2. Elucidate the public health risks posed by some of the viruses common locally and globally.
3. Demonstrate capacity to implement preventive and control measures against viral spread
4. Classify fungi by site and morphology
5. Discuss the common fungal infections and the epidemiological strata.
6. Define common terms used in parasitology.
7. Enumerate the common parasites found in the Republic of South Sudan
8. Describe the morphology and life cycles of common parasites
9. Describe the morphology of common arthropods causing disease.
10. Describe the life cycles of the common arthropods. In disease.
11. Demonstrate knowledge of the natural history of infectious diseases.
12. Show Interpretative skills so that a clinically useful opinion can be derived from laboratory data.
13. Appreciate the role of laboratory services and multidisciplinary care in medical care.
14. Technical knowledge, gained from familiarity with laboratory technology, so that methodology appropriate to a clinical problem can be chosen and so that quality control and quality assurance procedures can be implemented.
15. Explain the basic microbial biology (structure, genetics, taxonomy, physiology, epidemiology, classification and typing) of major bacterial, viral, fungal and parasitic agents.
16. Use knowledge of basic biology to justify investigations, infection prevention and control procedures and interpretation of results
17. Explain the basis of genetic susceptibility to pathogens and disease.
18. Explain the basics of the immune response to infection, host defense mechanisms, the immune system and immunity to infection and immunodeficiency.
19. Compare and contrast cellular and humoral immunity
20. Explain the basis of how the immune response protects against infection, and how it may contribute to pathogenesis of infectious diseases.
21. Explain the basis of different types of host−parasite relationships: symbiosis, viral latency, quasi- species evolution, etc.
22. Explain the types of immunodeficiency and how they affect susceptibility to and control of infectious diseases
23. Use knowledge of host−pathogen relationships to analyse clinical presentation of infections and justify investigations and interpretations of results
24. Explain microbial pathogenicity and genetic susceptibility to pathogens and diseases.
25. Explain epidemiology of infectious diseases - their surveillance and control.
26. Explain typing methods available: the principles, advantages and limitations of various phenotypic and genotypic methods.
27. Describe the role of typing in incident/ surveillance and outbreak investigations.
28. Understand about antimicrobial agents, their mode of action and mechanisms of microbial resistance.
29. Explain how vaccines work

Course Content

Part I – General microbiology

1. Subject and tasks of microbiology. The role of Pasteur and Koch for development of medical microbiology. Taxonomy of microorganisms – nomenclature and classification. General characteristics of different groups of microorganisms.
2. Morphology of bacteria – shape, size, arrangement. Methods for studying bacterial morphology. Bacterial structure – essential and nonessential components: cell envelope, cytoplasm and cytoplasmic inclusions, capsules, flagella, fimbriae, spores.
3. Bacterial genetics. Genotype and phenotype of bacteria. Genetic apparatus in bacteria. Bacterial chromosome as a genetic system. Extrachromosomal genetic elements. Bacteriophages – main types, structure, interactions with the microbial cell – lytic cycle, moderate phage, prophage, phage conversion, phage-typing.
4. Microbial mutability. Mutations. Mutagenic factors – chemical and physical, mechanism of action, practical use. Genetic transfer – transformation, conjugation, transduction – mechanisms. The importance of bacterial and phage genetics. Genetic engineering. Contemporary genetic methods in clinical microbiology. DNA probes. PCR – polymerase chain reaction.
5. Bacterial physiology. Chemical composition of bacterial cell. Bacterial enzymes. Bacterial metabolism – catabolic and anabolic processes. Bacterial respiration. Bacterial nutrition. Transport of nutrients.
6. Bacterial growth and reproduction. Growth phases and growth curves. Bacterial culture – basic principles, culture media. Bacterial growth factors.
7. Influence of physical factors on microorganisms: heat, drying, light, atmospheric pressure, osmotic pressure, radiation, pH, ultrasound. Sterilization.
8. Methods of sterilization. Influence of chemical factors on microorganism.
9. Disinfection, types of disinfectants. Characteristics (special features) of disinfecting and sterilizing procedures in the dental practice. Mechanism of action of chemicals upon bacteria. Oligodynamics. Influence of biological factors upon microorganisms: symbiosis, antagonisms, antibiosis.
10. Antimicrobial agents: Main groups, spectrum and mechanism of action. Mechanisms of resistance to antimicrobial agents. Antibiotic susceptibility tests.

Part II – Infection and Immunity

1. Infection and infectious process.
    1. The role of microorganism in the infectious process.
    2. Pathogenic factors: pathogenicity, virulence, invasiveness, toxigenecity.
    3. The role of microorganism in the infectious process.
    4. The role of the environment for development and course of the infectious process.
    5. Epidemic process: factors and mechanisms of transmission of the infectious agents in the epidemic process.

2. Characteristics of infectious diseases:
    1. Pathogenesis.
    2. Forms of the infectious process. Focal infection in humans.
3. Immunity
    1. Definition.
    2. Types of immunity.
    3. The protective role of adaptive immunity.
    4. Microbial factors counteracting the mechanisms of the adaptive immunity.

4. Anatomy and structure of the immune system
    1. Primary and secondary organs.
    2. Cells of the immune system.
    3. Development of the immunocompetent cells –positive and negative selection.

5. Antigens
    1. Types of antigens.

2. Antigenic characteristics of microorganisms.

6. Humoral immunity
1. Characteristics of antibodies (immunoglobulins).
2. Structure and function of different immunoglobulin classes.
3. Mechanism of action of antibodies.

7. Local immunity. Monoclonal antibodies.

8. Cellular immunity
1. Cells and mechanism of action.
2. Types of cellular immunity.
3. Cellular cooperation in the immune response.

9. Development of the immune response.
1. Recognition of antigens.
2. The role of APC and MHC molecules.
3. Dynamics of the immune response – primary and secondary immune response.
4. Genetic control of the immune response.
5. Humoral regulation of the immune response.

10. Allergy – definition and types.
1. Immediate allergic reactions – anaphylaxis, atopy, clinical significance.
2. Cytotoxic allergic reactions.
3. Allergic phenomena due to immune complexes – serum sickness, Arthus phenomenon, clinical significance.
4. Delayed type hypersensitivity – tuberculin skin test (Mantoux), contact dermatitis.
5. Clinical significance of hypersensitivity in medicine.

11. Immunopathology.
1. Immunopathological reactions and diseases.
2. Immunological tolerance.
3. Autoimmune diseases.
4. Immunodeficiencies – disorders and diseases.
5. Infections in patients with immunodeficiency syndromes.

12. Antigen-antibody reactions.
1. Types: agglutination, precipitation, neutralization, complement fixation test.
2. Labelled immune reactions – immunofluorescence, radioimmune and immunoenzyme tests.
3. Mechanisms and practical application of the reactions in microbiological diagnosis.

13. Immunoprophylaxis and immunotherapy.
1. Vaccines and sera.
2. Immunomodulation.

Part III – Special Microbiology

1. Microbiological diagnosis of infectious diseases.
1. Methods and algorithm of the microbiological examination of specimens direct microscopy, isolation and identification of microorganisms; serological diagnosis; modern molecular – biological tests.

1. Staphylococcus spp.
1. Classification.
2. Morphology, biology.
3. Pathogenic factors.
4. Pathogenicity, diseases and immunity.
5. Microbiological diagnosis
6. Antimicrobial treatment.
7. MRSA – clinical importance and diagnosis.

2. Streptococcus spp.
    1. Classification
    2. Morphology, biology, antigenic structure.
    3. Pathogenic factors
    4. Pathogenicity of streptococcal infections
    5. Diseases and immunity.
    6. Microbiological diagnosis.
    7. Antimicrobial treatment.
    8. Streptococcus pneumoniae. Morphology, biology, biochemical production and antigenic structure. Pathogenesis, diseases and immunity. Microbiological.

3. Gram-negative bacteria causing air-borne infections. Haemophilus influenzae. Morphology, biology, antigenic structure. Pathogenic factors. Diseases. Immunity. Microbiological diagnosis. Specific prophylaxis and therapy. The causative agent of Whooping cough (Bordetella pertussis). Morphology, biology.

4. Pathogenic factors. Pathogenicity and immunity.
Microbiological diagnosis. Specific prophylaxis and therapy. Neisseria meningitidis. Morphology, biology. Pathogenic factors. Pathogenicity and clinical forms of meningococcal infection. Immunity. Microbiological diagnosis. Specific prophylaxis and therapy. Neisseria gonorrhoeae. Morphology, biology. Pathogenic factors. Pathogenicity and clinical forms of gonococcal infection. Immunity. Microbiological diagnosis. Prophylaxis and therapy.

5. Enterobacteriaceae family. Main groups enteric bacteria concerning their pathogenicity General characteristics – morphology, biology, antigenic structure, pathogenic factors. Opportunistic enteric bacteria – Escherichia coli, Klebsiella. Diseases. Microbiological diagnosis

6. Salmonella. General characteristics – morphology, biology, classification, antigenic structure, pathogenic factors, diseases, microbiological diagnosis. Dysentery (Shigella spp.). Characteristics and microbiological diagnosis. Pseudomonas. Morphology, biology, pathogenic factors. Diseases. Microbiological diagnosis. Therapeutically problems.

7. Causative agents of infections with high biological risk (Yersinia pestis). Morphology, biology, pathogenic factors. Pathogenesis and immunity. Microbiological diagnosis. Specific prophylaxis and therapy. Vibrio cholerae. Morphology, biology, antigenic structure, serotypes. Pathogenic factors. Microbiological diagnosis. Specific prophylaxis and therapy. Pathogenesis and immunity. Microbiological diagnosis. Specific prophylaxis and therapy. Bacillus anthracis. Morphology, biology. Pathogenesis and clinical forms. Immunity. Specific prophylaxis and therapy. Microbiological diagnosis.

8. Corynebacterium spp. Corynebacterium diphtheria. Morphology, biology, pathogenic factors. Pathogenicity and immunity. Microbiological diagnosis of diphtheria Specific prophylaxis and therapy. Coryneforms (C. jeikeum, C. urealyticum, C. amycolatum, C. pseudodiphtheriticum). Clinical importance. Mycobacteria. Mycobacterium tuberculosis. Morphology, biology. Pathogenicity, clinical forms and immunity. Microbiological diagnosis. Specific prophylaxis and therapy. Mycobacterium leprae. Morphology, biology, pathogenesis, clinical forms. Microbiological diagnosis. Prophylaxis
9. Anaerobic spore-forming bacteria – genus Clostridium. General characteristics. Morphology, biology. Clostridium tetani. Toxin production. Pathogenicity and immunity. Microbiological diagnosis. Specific prophylaxis and therapy. The causative agents of gas gangrene (C. perfringens, C. oedematiens, C. septicum, and C. histolyticum). Pathogenic factors. Pathogenicity and immunity. Microbiological diagnosis. Prophylaxis and therapy. Clostridium botulinum. Toxin production. Pathogenesis and immunity. Microbiological diagnosis. Prophylaxis and therapy.
10. Anaerobic non-spore forming bacteria. Anaerobic Gram-positive round- and rod-shaped bacteria. Genus Peptostreptococcus, Propionibacterium, Lactobacillus and Eubacterium. Anaerobic Gram-negative round- and rod shaped bacteria. Genus Bacteroides, Fusobacterium. The role of the anaerobic non-spore forming bacteria in the etiology of infectious processes in humans.
11. Spirochetes (Spirochaetaceae). General characteristics. The causative agent of syphilis (Treponema pallidum). Morphology and biology. Pathogenesis and immunity. Microbiological diagnosis. Leptospira spp. Morphology and biology. Antigenic structure and serological types. Pathogenesis and immunity. Microbiological diagnosis. The causative agent of Lyme disease (Borrelia burgdorferi). Pathogenesis, immunity, microbiological diagnosis.

Viruses and viral infections

1. Classification, general properties related to viral families, physical and chemical properties
2. Replication and cultivation of viruses
3. Host response to viral infections
4. Genetics
5. Molecular basis of pathogenesis
6. Latent and persistent infections
7. Epidemiology
8. Oncogenic viruses
9. Principles of cultivation, assay and laboratory diagnosis, laboratory safety
10. Pathogenic viruses: DNA viruses; RNA viruses
11. Viral syndromes, HIV/AIDS and other viral sexually transmitted diseases,emerging viral infections
12. Viral childhood fevers
13. Viral CNS infections
14. Viral skin manifestations
15. Prions and their disorders
16. Anti-retroviral agents and mechanisms of action

Viruses of Medical Importance

1. Viruses of the CNS (Herpes. Entero, Polio and Rabies).
2. Retroviruses (HIV and AIDS, SARS-CoV 2, Zika, MERS).
3. Respiratory viruses (Influenza, RSV, Adeno, Echo and Coxsackie).
4. GIT viruses (Rota, Adeno, Norwalk, SRSVs).
5. Hemorrhagic viruses (Lassa, Marburg).
6. Prevention, Control and Eradication of Viral Diseases.

Mycology

1. Classification of medically important fungi
2. Epidemiology, structure, pathogenesis, diagnosis, treatment and control of: superficialand cutaneous mycosis: dermatophytes and non dermatophytes; systemic, subcutaneous and deep mycoses, mycetoma, eumycetoma, yeast infections, candida and Cryptococcus, aspergillosis, mycotoxins.

Medical Parasitology

- Definitions and terminology
- Taxonomy and classification of medically important parasites
- Life cycles, epidemiology, pathogenesis, host response, clinical manifestations, diagnosis, treatment and control of diseases caused by nematodes, cestodes and trematodes
- Life cycles, epidemiology, pathogenesis, host response, clinical manifestations, diagnosis, treatment and control of diseases caused by protozoan parasites including blood protozoa, gastrointestinal protozoa and tissue protozoa.
- Emerging parasitic disease in immuno-suppressive states (HIV / AIDS)
- Laboratory methods; collection and handling of clinical specimens, identification of pathogenic organisms.

Medical entomology

- Medically important vectors of parasitic infections
- Ecology, physiology, population biodynamics, vectoral capacity and control
- Ectoparasites, blow flies, bot flies, venomous bites and stings
- Laboratory methods: Collection, handling of clinical specimens, identification of pathogenic organisms.

Teaching Methods and Contact Hours

Lectures,
Problem solving,
Small group discussions,
Case based education.

Contact hours:
Lectures - 6 hours per week,
Practical - 3 hours every 2 weeks
Tutorial - 1 hour per week
Seminars - 3 hours every 2 weeks

Assessment Methods:

Continuous assessment -	**40%**
Continuous assessment Tests -	35%
Laboratory/practical reports -	5%
Final written examination -	**60%**
Paper 1 - Essays and short notes-	30%
Paper 2 – Multiple choice questions-	20%
Final Oral examination -	10%

Recommended Text Books

1. Brostoff, R. (1996) Immunology, 4th Edition, Mosby, London.
2. White, D.O. and Fenner, F.J. (1994) Medical Virology, 4th Edition. Academic Press, London. ISBN: 0-12-746642-8.
3. Beaver P.C., Jung R.C., Cupp, E.W., (1984). Clinical Parasitology. Lea and Ferbiger, Philadelphia. ISBN 0-471-93100.
4. Sherris, J.C. et. al. (1990). Medical Microbiology: An Introduction to Infectious Diseases, 2nd Edition, Elsevier, New York. ISBN: 0-444--01508-6.

(2) Course title: Pathology

Credit hours: 20
Contact hours: 195
Practical/Clinical Round: 270

Introduction

General pathology introduces the fundamental principles of disease mechanism and processes, histopathological nomenclature; which are applied to understand the etiology, pathogenesis and pathophysiology of systemic diseases.

This course has three components: general and systemic pathology, haematology, and chemical pathology. General and systemic pathology: the fundamental principles of disease mechanism and processes- histopathologic nomenclature, which are applied to understand the aetiology, pathogenesis and pathophysiology of systemic diseases. Haematology, provides the student with an understanding of the principles and concepts of various haematological processes in health and disease. The chemical pathology component provides the student with an understanding of biochemical changes and their effects in disease processes, this part also equips the student with knowledge and skills in chemical pathology as used in the diagnosis, therapy and monitoring of pathological and normal conditions.

Course aim

To apply the principles and concepts of general pathology in health and disease of systems and impart knowledge and skills in general pathology.

Learning outcomes/Course Objectives

At the end of the course, the student should be able to:

1. Define pathological terminologies used to describe disease mechanism and processes.

2. Describe changes in tissue inflammation, healing and repair processes.
3. Explain the etiology and pathogenesis of edema, thrombosis, shock, immune disorders and neoplasia.
4. Recognise tissue changes in varying pathologies on histology and gross organ appearance.
5. Explain the aetiology, pathogenesis and pathophysiology of systemic diseases
6. Describe the physiology and functions of blood cells.
7. Describe disorders of the blood cells, including their etiology, pathogenesis and laboratory diagnosis.
8. Perform laboratory investigations on patients with haematological disorders and suggestions of further complimentary investigation.
9. Recognise the common disorders of red and white cells from examination of blood films.
10. Describe the physiology of blood and blood cells competently.
11. Explain the biochemical changes and their effects in disease processes.
12. Perform valid techniques to critically evaluate and interpret results from such techniques in chemical pathology.
13. Elucidate the mechanisms of disease based on development, structure and disturbed function.
14. Classify the causes of disease at the cellular, organ and systemic levels
15. Describe the types of injury at cellular, tissue and organ levels.
16. Illustrate the morphology of cellular injury and adaptation.
17. Define inflammation and its types and mechanisms.
18. Describe possible complications of inflammation in disease.
19. Outline the healing mechanisms and its complications.
20. Enumerate the modifying factors to the healing process.

Course content

Introduction to General Histopathology

1. Definition of pathology.
2. Aspects of Disease

Cause (aetiology).

1. Mechanism of development (pathogenesis).
2. Structural alterations (morphology).
3. Functional consequences of the above as observed clinically.

Cellular Changes

1. Definitions and causes of cellular injury and adaptation.
2. Cellular injury - causes: hypoxia physical, chemical infections, Immunologic, genetic derangement, nutritional imbalances.

Mechanisms.

1. Hypoxic injury (reversible/irreversible)/free radicals.
2. Viral injury

Morphology of injured cells

1. Reversible - cellular swelling, fatty change.
2. Irreversible- necrosis
3. Cellular adaptation - atrophy hypertrophy hyperplasia, metaplasia.
4. Intracellular accumulations and other alterations.
5. Fatty change
6. Dystrophic calcification
7. Proteins
8. Metastatic calcification
9. Glycogen
10. Hyaline change
11. Carbon
12. Lipofuscin
13. Melanin
14. Haemosiderin

Inflammation

1. Definition.
2. Types of inflammation.
3. Acute inflammation.
4. Features.

5. Definition of terms used: exudation, transudation, edema, pus.
6. Major events in inflammation: vascular flow and caliber, leucocyte
7. Chemical mediators (vasoactive amines, complement system, kinin system, clotting system, arachidonic acid and metabolites, platelet activating factor, cytokines).
8. Outcomes of inflammation.
9. Chronic Inflammation features.
10. Types: including granulomatous diseases.

Healing and Repair

1. Healing surgical wound as an example.
2. Repair regeneration - cell types (labile, stable, and permanent) /replacement - connective tissue.
3. Mechanisms of repair (growth factors, cell-cell-matrix interaction, EC matrix synthesis and collagenisation).
4. Modifying factors (blood supply, nutritional status, infection, drug intake, white cell count).

Fluid and Haemodynamic Derangements

1. Oedema
   Definition
   Causes (clinical) – Systemic: cardiac failure, renal and hepatic disease
   Causes (clinical) – Localized: organ - specific
2. Hyperemia and congestion.
3. Thrombosis - normal hemostasis (vascular wall, platelets, clotting factors).
4. Thrombogenesis – mechanism, morphology and fate of thrombi.
5. Shock
   Definition
   Clinical types
   Pathophysiology
   Morphology

Immunopathology

1. AIDS.
2. Possible Immune Disorders (amyloidosis, sarcoidosis).
3. Autoimmune disorders.
4. Tissue Transplant Incompatibility (rejection).

Neoplasia

1. Nomenclature - based on tissue type - benign/malignant - characteristics.
2. Predisposition - race, age, heredity, pre-neoplastic disorders.
3. Carcinogenesis - chemicals, radiation, viral oncogenesis.
4. Oncogenes and Anti Oncogenes.
5. Laboratory diagnosis of cancer.

Disorders of Blood Vessels and Lymphatics

1. Arteries.
2. Atherosclerosis
3. Vasculitis.
4. Aneurysms.
5. Veins.
6. Thromboses.
7. Tumours.

The Heart

Cardiac Failure

1. Hypertension and the heart.
2. Cor pulmonale.
3. Other causes.
4. Ischaemic heart disease.
5. Rheumatic heart disease.
6. Myocarditis.
7. Endocarditis.
8. Cardiomyopathy.

The Respiratory System

1. Pulmonary infections.
2. Bacterial
3. Non-bacterial
4. Chronic obstructive pulmonary disease.
5. Emphysema
6. Bronchitis
7. Asthma
8. Chronic restrictive pulmonary disease.
9. Bronchiectasis
10. Interstitial fibrosis
11. Pneumoconiosis.
12. Tumours.
13. Benign
14. Malignant

Lymphoreticular System

1. Lymphomas – classification and diagnosis of non-Hodgkin's and Hodgkin's disease.
2. Plasma cell dyscrasias and related disorders.

Gastrointestinal System

Oesophagus

1. Congenital anomalies (achalasia, hiatal hernia and others).
2. Lacerations.
3. Varices.
4. Inflammation – including Barrett's oesophagus.

Stomach

1. Inflammation – acute/chronic; Helicobacter gastritis and other forms.
2. Polyps.
3. Tumours – benign/malignant (epithelial, lymphoid).

Small intestine

1. Inflammation: infective/non-infective (including Crohn's disease).
2. Malabsorption syndromes.
3. Tumours: malignant (epithelial, lymphoid).

Colon

1. Inflammation: ulcerative colitis, pseudo-membranous colitis and others.
2. Tumors: polyps and polyposis syndromes; malignant tumors - (epithelial, lymphoid).

Appendix

1. Inflammation.
2. Tumours (carcinoid).

Liver, Biliary Tract and Exocrine Pancreas

Liver.

1. Viral hepatitis (A to E)
2. Cirrhosis (alcoholic, post-necrotic, pigment, biliary, AIAT, Wilson's disease)
3. Primary sclerosing cholangitis
4. Tumours: benign/malignant

Biliary tract.

1. Cholelithiasis
2. Cholecystitis
3. Tumours: benign/malignant (epithelial)

Pancreas.

1. Inflammation: acute/chronic
2. Tumours: benign (cysts, adenoma) and malignant (epithelial)

Urinary System

Kidney.

1. Cystic disease

2. Glomerular diseases: primary glomerulonephritis, secondary glomerular diseases
3. Pyelonephritis
4. Tumours; benign, malignant, Wilm's tumour

Urinary bladder.

1. Inflammation – acute/chronic
2. Tumours – benign/malignant
3. Pelvis/ureter – tumours

Male Genital System

Testis.

1. Inflammation – specific, non-specific, granulomatous
2. Tumours – WHO classification, clinical features, histology

Prostate.

1. Inflammation
2. Nodular hyperplasia
3. Tumours – malignant (epithelial)

Female Genital System

Vulva.

1. Dystrophy
2. Dysplasia
3. Tumours including Paget's disease

Vagina.

1. Tumours (epithelial, non-epithelial)

Cervix.

1. Inflammation – acute/chronic
2. Tumours – malignant (epithelial)

Body of uterus and endometrium.

1. Adenomyosis, endometriosis
2. Leiomyoma
3. Hyperplasia
4. Sarcomas

Ovary.

1. Inflammation – acute/chronic
2. Tumours – benign/malignant (epithelial)

Breast.

1. Inflammation – acute/chronic
2. Fibrocystic disease and other non-neoplastic disorders
3. Tumours: Benign – fibroadenoma, papilloma, phylloides tumour
4. Malignant – epithelial including Paget's

Endocrine System

Pituitary

1. Hyper/hypo – pituitarism
2. Tumours

Thyroid

1. Hyper/hypo – thyroidism
2. Thyroiditis
3. Goitre
4. Tumours: benign/malignant (including lymphomas)

Parathyroid: Hyper/hypo – parathyroidism

Adrenal – cortex: Hyper/hypofunction and medulla: tumours.

Thymus – tumours.

Pineal gland – tumours.

The Skin

1. Naevi
2. Tumours – malignant: epithelial, melanoma

Musculoskeletal System

1. Infections – pyogenic/non-pyogenic.
2. Osteomalacia / osteoporosis.
3. Hyperparathyroidism.
4. Renal osteodystrophy and other conditions including Paget's.
5. Diseases affecting joints.
6. Diseases affecting muscle.

Nervous System

1. Infections.
2. Intracranial haemorrhage / cerebral trauma.
3. Tumours: CNS / Peripheral NS.

Teaching/Training Methods

Lectures - 4 hour per week
Seminars - 2 hours per week
Laboratory Practical- 6 hours per week
Lectures
Tutorials
Small group teaching
Web/ICT learning.

Assessment Method

Continuous Assessment -	**40%**
Tests-	20%
Assignments-	10%
Seminars-/portfolio-	10%
Final examination -	**60%**
Written-	40%
Practical-	15%
Final Oral Examination-	5%

Recommended Text Books

1. Macsween R. (1996). Muir's Textbook of Pathology. Edward Arnold. London.
2. Robbins SL and Kumar V (1996). Basic Pathology.WB Saunders Co. London.
3. Pallister CJ (1994). Blood Physiology and Pathophysiology. Butterworth- Heinemann. Oxford.
4. Hoffbrand AV and Pettit JE (2006). Essential Haematology (6th Edition). Blackwell Scientific Publications, Oxford.
5. Dacie JV and Lewis SM (2006). Medical Laboratory Haematology (2nd Edition). Butterworth-Heinemann, Oxford.
6. Luxton RW (1997). Fundamentals of Clinical Biochemistry Explained (ed. Pallister CJ). Butterworth-Heinemann. Oxford.
7. Kumar, Abbas and Fautso (2005). Robbins Basic Pathologic Basis of Disease. WB Saunders. Philadelphia. ISBN: 0-8089-2302-1.
8. Burtis CA and Ashwood ER (1998). Tietz Textbook of Clinical Chemistry (4th Edition). WB Saunders, Philadelphia. ISBN: 0721637639. London.
9. Thomson and Douglas A. (1990). Lecture notes on Pathology. Blackwell Scientific. London.
10. Dolinak D, Matshes E and Lew E. (2005). Forensic Pathology – Principles and Practice. Elsevier Academic Press. London, Burlington & California. ISBN-13: 978-0-12- 219951-6 and ISBN-10: 0-12-219951-0.
11. Simmons A (1997). Haematology. Butterworth-Heinemann, Oxford.
12. Nguyen DT and Diamond LT (1999). Diagnostic Haematology. Butterworth- Heinemann, Oxford.

13. Fleming AF (1995). Haematological Diseases in the Tropics in Manson's Tropical Diseases (20th Edition). WB Saunders, Philadelphia.
14. Zilva TF, Pannall RP and Mayne PD (1988). Clinical Chemistry in Diagnosis and Treatment (5th Edition). Lloyd-Luke Medical Books. London.
15. Luxton RW (1997). Fundamentals of Clinical Biochemistry Explained (ed. Pallister CJ). Butterworth-Heinemann. Oxford.

(3) Course title: Clinical Pharmacology

Credit hours: 10
Contact hours: 90
Practical/Clinical Round: 180

9.22.1. Introduction:

The course imparts the student with an understanding of fundamental concepts of pharmacology to enable the student appreciate the pharmacology and therapeutic applications of drugs acting on the systems of the body. It will also enable the student to understand the principles of pharmacotherapy in particular the emerging of antimicrobial resistance, side effects of drugs and effects of drug interactions.

9.22.2. Course Aim

1. To provide the student with a thorough understanding of the fundamental concepts of pharmacology
2. To enable the student to describe the pharmacology and therapeutic applications of drugs acting on various systems.
3. To provide the student with a sound understanding of the principles of rational pharmacotherapy and containment of antimicrobial resistance.

9.22.3. Course Objectives/Learning outcomes

At the end of the course, the student should be able to:

1. Describe the principles and applications of pharmacodynamics and pharmacokinetics.
2. Describe the process of chemical transmission in the autonomic nervous and central nervous system.
3. Explain drug mechanisms with regards to their beneficial and harmful effects.
4. Describe the treatment of specific diseases.
5. Describe drug interactions during treatment, beneficial and harmful.
6. Apply the general principles of prescribing effective, safe, cost- effective therapeutic drugs.
7. Describe the stewardship of preventing antimicrobial resistance (AMR).
8. Write a prescription

9.22.4. Course Competences

1. Define terminologies used in pharmacology and therapeutics.
2. Describe the advantages and disadvantages of the routes of drug administration.
3. Elucidate the mechanisms of how drugs move across the cell membrane.
4. Understand and explain the importance of drug monitoring in clinical practice.
5. Identify drug actions on specific body systems along with their possible complications.
6. Demonstrate knowledge and safety of drug combinations in clinical practice.

9.22.5. Course Content

9.22.5.1General Pharmacology

1. Introduction to the pharmacological basis of therapeutics.
2. Common terminologies used in pharmacology and therapeutics.
3. Different routes of drug administration, their advantages and disadvantages.
4. The process of new drug development, including preclinical studies and clinical trials.

9.22.5.2 Pharmacokinetics

1. The clinical significance of the membrane transport process; absorption and distribution of drugs.
2. Significance of drug bioavailability.

3. The clinical significance of drug metabolism and excretion.
4. Clinical usefulness of drug therapeutics monitoring.

9.22.5.3 Pharmacodynamics

1. Mechanism of drug action
2. Discuss receptor pharmacology.
3. Factors that modify drug action
4. 4. Understanding individual variations in response to drugs.

9.22.5.4 Autonomic Pharmacology

1. The organization and function of Autonomic Nervous System (ANS).
2. Neuro-humoral transmission.
3. ANS regulation of different functions of the body.

9.22.5.5 Cholinergic and anti-cholinergic drugs

1. Cholinergic receptors and transmission.
2. 2. Clinical pharmacologic and therapeutic uses of cholinergic agonists and anticholinesterases.
3. 3. Clinical pharmacologic and therapeutic uses of anticholinergic drugs.

9.22.5.6. Adrenoceptor agonists and antagonists

1. Adrenoceptors and adrenergic transmission.
2. Clinically relevant pharmacology and therapeutic uses of alpha and beta adrenoceptor agonists (Sympathomimetic).
3. Clinically relevant pharmacology and therapeutic uses of alpha and beta adrenoceptor antagonists (Antiadrenergic drugs).
4. Drugs used to treat glaucoma

9.22.5.7 Drugs acting on the Central nervous system

1. Introduction to the CNS Pharmacology
2. Drugs for neurodegenerative diseases
3. General and local anaesthetics and skeletal muscle relaxants
4. Sedative-hypnotics and anxiolytic drugs
5. Antidepressants
6. Antipsychotic drugs
7. Antiepileptic drugs
8. Opioid analgesics and antagonists
9. Drugs of abuse
10. CNS stimulants
11. Ethyl and methyl alcohol

9.22.5.8 Drugs Acting on the Cardiovascular System

9.22.5.8.1. Drug management of cardiac dysrhythmias

1. Classification of antiarrhythmic drugs.
2. Clinical pharmacologic and therapeutic uses of antiarrhythmic drugs.
3. Choice of drugs for different types of atrial and ventricular arrhythmias.

9.22.5.8.2. Drug management of heart failure

1. Pharmacologic actions: pharmacokinetics, adverse effects, precautions, contraindications, Interactions, therapeutic uses of cardiac glycosides.
2. The use of other drugs in cardiac failure.
3. Drug and non-drug management of cardiac failure.

9.22.5.8.3 Drug management of angina pectoris

1. Classification of antianginal agents.
2. Pharmacologic and therapeutic uses of antianginal agents.
3. Drug therapy of myocardial infarction.

9.22.5.8.4 Drug management of hypertension

1. Classification of antihypertensive drugs.
2. Pharmacologic and therapeutic uses of antihypertensive drugs
3. Drug and non-drug management of hypertension
4. 4. Identify the drugs of choice in patients with other co-existing conditions
5. Drug management of hypertensive emergencies

9.22.5.8.5 Drug management of hyperlipidemia

1. Classification of hyperlipidemic drugs
2. Clinical pharmacology of different hyperlipidemic drugs
3. Therapeutic uses of hyperlipidemic agents
4. Outline the drugs and none drug management of hyperlipidemia

9.22.5.9 Endocrine System

1. Pituitary-hypothalamic axis
2. Thyroid hormones
3. Reproductive hormones-testosterone, estrogen, progesterone, contraceptives
4. Drugs therapy of diabetes
5. Corticosteroids
6. Oxytocin and drugs acting on uterus
7. Drugs affecting calcium balance.
8. Drugs used in the management of erectile dysfunction.

9.22.5.10. Drugs Acting on Respiratory System

9.22.5.10. 1. Drug management of bronchial asthma

1. Classification of drugs used for bronchial asthma
2. Clinically relevant pharmacology of drugs used in bronchial asthma
3. Drug management of bronchial asthma
4. Management of status asthmatics

9.22.5.10. 2. Anti-tussive drugs and mucolytic agents

1. Anti-tussive and mucolytic drugs
2. Clinical pharmacology and uses of anti-tussive and mucolytic agents

9.22.5.11. Drugs acting on the gastro-intestinal System

9.9.5.11.1 Drug management of peptic ulcer disease & gastro-esophageal reflux disease

1. Mechanism of action, adverse effects, and therapeutic usefulness of different drugs used in peptic ulcer management.
2. Drugs used for management of Helicobacter pylori infection
3. Drug and non-drug management of peptic ulcer
4. Drugs used for gastroesophageal reflux disease

9.22.5.11.2 Emetics and Anti-emetics

1. Classification of anti-emetics
2. Clinically relevant pharmacologic and therapeutic uses of anti-emetics

9.22.5.11.3 Anti-diarrhoeal drugs

1. General principles of management depending on the nature and severity of diarrhea: treatment of fluid depletion, maintenance of nutrition, and drug therapy.
2. Intravenous and oral rehydration therapies
3. Describe the clinical pharmacologic and therapeutic uses of drugs used in symptomatic relief of diarrhea.

9.22.5.11.4 Laxatives

1. Classification of laxatives

2. Clinically relevant pharmacology and use of laxatives

9.22.5.12. Inflammation and Allergy

9.22.5.12.1 Local hormones (autacoids) and mediators of inflammation

1. Actions of histamine, 5-hydroxytryptamine (serotonin), prostaglandins, leukotrienes and platelet activating factor

9.22.5.12.2. Drugs used to suppress inflammatory & immune reactions

1. Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)
2. Pharmacology, adverse effects and therapeutic uses of NSAIDs, and acetaminophen.
3. Clinically relevant pharmacology, including adverse effects and uses of drugs used for rheumatoid arthritis and gout
4. Pharmacology and use of antipyretic drugs

9.22.5.13. Blood

9.22.5.13.1. Drugs that affect hemostasis & thrombosis

1. Pharmacologic and therapeutic uses of vitamin K and other agents
2. Mechanism of action, indications, adverse effects, interactions, precautions/contraindications of parenteral and oral anticoagulants
3. Clinical pharmacologic and therapeutic uses of fibrinolytic drugs (thrombolytic), antifibrinolytics, and antiplatelet agents

9.22.5.13.2 Drug management of anemia

1. Pharmacologic and therapeutic uses of drugs used in the treatment of different types of anemia

9.22.5.14. Chemotherapy

9.9.5.14.1. General issues relating to chemotherapy

1. General principles of rational antimicrobial therapy, including the importance of accurate diagnosis and selection of the appropriate agent
2. The importance of rapid diagnostic tests for quick and proper management of infections, and locally available tests
3. Principles of rational use of antimicrobials for prophylaxis
4. The problem of widespread overprescribing and inappropriate prescribing of antimicrobials and list factors responsible for such practices
5. Antimicrobial resistance (AMR) and multidrug resistance (MDR) and the mechanism of AMR
6. Diseases of major public health importance for which AMR is an issue (TB, malaria, pneumonia,
7. bacillary dysentery, STI, HIV/AIDS)
8. The role of effective immunization programs in reducing infectious disease burden and AMR

9.22.5.14.2 Anti-bacterial agents

1. Classification of antibacterial agents according to their mechanism of action
2. The antibacterial spectrum, mechanism of action, clinically relevant pharmacokinetics, adverse effects and use of sulfonamides, cotrimoxazole, beta-lactam antibiotics (penicillins, cephalosporin, monobactams, and carbapenems), quinolones, tetracyclines, chloramphenicol, aminoglycosides, macrolides, clindamycin, vancomycin, and other newer antibacterial agents

9.22.5.14.3 Anti-viral agents

1. Antiviral agents and discuss their mechanism of action, clinically relevant pharmacology, adverse effects and uses

9.22.5.14.4 Anti-fungal agents

1. Antifungal agents and discuss their mechanism of action, clinically relevant pharmacology, adverse effects and uses

9.22.5.14.5 Anti-protozoal agents

1. Mechanism of action, pharmacology, adverse effects and uses anti-protozoal, antiamoebics
2. Classification of anti-malarial agents and discuss their mechanisms of action, clinically relevant pharmacokinetics, and adverse effects
3. Nationally-recommended management of malaria

9.22.5.14.6 Anti-helminthic agents

1. Mechanism of action, pharmacology, adverse effects and uses of anthelminthic agents
2. First choice and alternative drugs used for different types of helminths

9.22.5.14.7 Drug management of HIV/AIDS

1. Classification of: antiretroviral agents and their mechanism of action, relevant pharmacokinetics, adverse effects and important drug interactions, teratogenic effects
2. Nationally-recommended management of HIV and AIDS
3. Post-exposure and prenatal prophylaxis of HIV infection
4. Pre-exposure prophylaxis

9.22.5.14.8 Drug management of tuberculosis

1. First and second line anti-tuberculosis drugs; their mechanism of action, pharmacokinetics, adverse effects and interactions
2. Nationally-recommended management of tuberculosis, including MDR tuberculosis

9.22.5.14.9 Drug management of cancer

1. Cancer chemotherapy/oncology
2. Classification of anticancer drugs; their salient pharmacological features, including their uses and adverse effects
3. General principles of cancer chemotherapy

9.22.5.15. General Topics and Therapeutics

1. Evidence-Based Medicine (EBM)
2. EBM and its importance in attaining rational use of therapeutics.
3. Principles of rational prescribing and monitoring drug therapy (as recommended in the WHO Guide to Good Prescribing).
4. Selecting and prescribing medicines appropriately as recommended in the WHO book “Guide to Good Prescribing”.
5. Effective communication with and counseling of patients/caregivers regarding use of medicines, adherence to treatment, responsible self- medication, and infection prevention.

9.22.5.16. Prescribing for children, pregnant women, lactating mothers, and the elderly

1. Principles of prescribing for special groups of patients such as children, pregnant women, lactating mothers, and the elderly

9.22.5.17. Pharmacovigilance

1. Pharmacovigilance-related issues such as adverse drug reaction (ADR), medication errors, and poor drug quality.
2. The role of prescribers in addressing such issues and promoting drug safety
3. Mechanisms of drug interactions and their clinical implications

9.22.5.18. Management of drug overdose and poisoning

1. General principles of management of drug overdose and poisoning
2. The management of overdose and poisoning with selected drugs and poisons

9.22.5.19. South Sudan Essential Medicines List, and Formulary and their role in rational use of medicines

1. Standard treatment guidelines/drug formularies/essential drugs lists, and locally produced documents and their role in promoting rational use of drugs
2. Antimicrobial resistance (factors contributing to AMR; impact of AMR; global and local examples of AMR; strategies to contain AMR)
3. Key factors contributing to emergence and spread of AMR
4. Individual and public health consequences of AMR
5. Selected local and global examples/case stories of AMR, including MDR (e.g., in TB, malaria, HIV/AIDS, hospital-acquired infections, STIs, etc)
6. The role of prescribers in containing AMR such as judicious antimicrobial prescribing, patient education, hospital infection control activities, and use of AMR surveillance information to guide prescribing
7. The role of prescribers as agents for awareness and advocacy on issues such as Substandard/counterfeit drugs, use of antimicrobials for growth promotion in animals, and overall AMR containment

9.22.5.20. Factors influencing prescribing and critical analysis of promotional literature

1. Factors influencing prescribing
2. Promotional drug information provided by pharmaceutical industry

Teaching Methods and Contact Hours

Small group teaching
Lecturers
Seminars
Practicals
Web/ICT Teaching

Assessment Methods:

Continuous assessment -	**40%**
Continuous assessment Tests -	35%
Laboratory/practical reports -	5%
Final written examination -	**60%**
Paper 1 - Essays and short notes	30%
Paper 2 -Multiple choice questions	20%
Final Oral examination -	10%

Recommended Text Books

1. H. Rang, M. Dale, J. Ritter and R. Flower, (2007) Pharmacology, 6th Edition
2. D.R. Laurence, P. N. Bennet and M. J. Brown, (2004) Clinical Pharmacology, 10th Edition
3. Bertram G. Katzung (2004), Basic and Clinical Pharmacology10th Edition
4. Goodman & Gillman's, (2005) The Pharmacological Basis of Therapeutics, 11th Edition
5. Laurence Brunton, John Lazo and Keith Parker
6. WHO, (1994) Guide to Good Prescribing: A Practical Manual. Geneva
7. WHO (2001) Global Strategy for Containment of Antimicrobial Resistance. Geneva.
8. K.D Tripathi, (2018) Essentials of Medical Pharmacology, 8th Edition
9. Satoskar, SD Bhandarkar, SS Ainapure, (2020) Pharmacology and Pharmacotherapy 26th Edition
10. RA Harvey and PC Champe, Lippincott pharmacology

14.4. Sub Specialty (Minor Clinical Subjects/Courses: Semester IX & X (5th yr)

Courses to be taught: Community Medicine, Forensic Medicine and Toxicology, Ophthalmology, Otolaryngology (ENT), Dermatology and Venerology, Orthopedics and Traumatology, Anaesthesiology and Critical Care Medicine, Radiology and Medical Imaging, Psychiatry and Mental Health, Molecular Medicine, Pediatrics and Child Health, Reproductive Health and Obstetrics& Gynaecology, Internal Medicine and Surgery

Credit hours: 100

Contact hours: 555

Practicals/Clinical Rounds: 2,790

(1)Course title: Forensic Medicine and Toxicology

Credit hours: 4
Contact hours: 30
Practical/Clinical Round: 90

Introduction

This course introduces the student to the interface of medical and legal practice through explaining the role of the medical doctor in courts of law, also, expose the students to medical ethics, medico-legal issues and principles of toxicology. The course spells out specific legal definitions which a doctor must know when handling cases with medico-legal issues. Preparing the student to be an ethical and credible witness in court cases.

Course Aim

To equip the student with skills to manage medico-legal issues, plan, implement and evaluate medical jurisprudence issues as well as basic knowledge of toxicology.

Course Objectives/Learning Objectives

At the end of the course, the student should be able to:

a) Understand and interpret forensic wounds
b) Filling of legal forms (e.g. form 8).
c) Attend post-mortem examination and prepare autopsy reports;
d) Learn medico-legal procedures
e) Outline medical ethics as prescribed by the Medical Council of South Sudan.
f) Learn basic principles of Forensic Toxicology.

Course Competencies

- Define medico-legal terms and their applications
- Prepare medical evidence for the courts.
- Outline the ethical principles of medical practice.
- Outline the interface of applied health ethics and research
- Identify the features used in human identification and their legal interpretations.
- Interpret investigations in medico-legal cases
- Exercise discipline and precision during post-mortems of medico-legal significance.
- Describe features in death, decomposition and skeletal remains of medico-legal significance.
- Identify weapons by their effects on human tissue and organs.
- Outline the principles of General Forensic Toxicology.
- Identify common causes of poisoning

Course Content

1. Legal Procedures

- Summons and subpoena
- Medical evidence
- Witnesses
- Procedure in court
- Conduct of the Doctor in court

2. Medical Jurisprudence

- Medical Council of South Sudan
- Ethical aspects of medical practice
- Legal aspects of medical practice
- Doctors and medical records (Irrelevant)
- Consent and Confidentiality.
- Medical negligence
- Biomedical waste management
- Ethics and medical research

3. Identification

- Sex
- Race
- Age
- Age estimation in infants, children and adults
- Stature

4. Forensic Osteology

- Skull
- Mandible.
- Femur
- Fibula
- Numerus
- Radius
- Ulna
- Sternum
- Scapula
- Clavicle
- Pelvis and Hip bone
- Sacrum

5. DNA profiling

- Basic consideration
- Typing
- Application of DNA profiling
- DNA evidence
- Collection, preservation and forwarding of sample

6. Forensic Odontology.

7. Medico-legal autopsy (All types of autopsies i.e., medicolegal and hospital autopsies)

- Autopsy procedure
- Laboratory procedure
- Fetal autopsy
- Exhumation
- Autopsy Artefacts

8. Death and changes after death

- Types of death
- Brain death (Is part of types of death)
- Death certification

- Apparent death (Is a confusing title)
- Modes of death
- Manner of death
- Changes after death
- Forensic entomology
- Sudden Natural death

9. Wounds

- Physics of wounding Mechanical injury
- Abrasion wound
- Contusion wound
- Laceration wound
- Incision wound
- Chop wound
- Stabwound
- Fractures

10. Firearm injuries and bomb blasts injuries

- Firearm injuries
- Smoothbore firearms
- Rifled firearms
- Wound ballistics (It include gunshot wounds).
- Gunshot wounds (Repetition).
- Autopsy examination
- Explosions and bomb blasts injuries

Forensic Toxicology

- General principles of toxicology.
- Examples of common poisoning.

Teaching/Training Methods and Contact Hours

Lectures - 2 hours per week
Practical - 3 hours per week

Assessment

Continuous Assessment -	**40%**
Assignment -	20%
Tests -	20%
Final Examination-	**60%**
Written Examination -	40%
Practical -	15%
Final Oral exam -	5%.

Recommended Text Books

1. C.J. Polson (1962). The essentials of forensic medicine. London.
2. N.J. Modi (1977). Medical jurisprudence and Toxicology.
3. Glaister (1966). The Pathology of Homicide.
4. B. Knight (1975). Forensic Medicine.
5. Lester Adelson (1974). The pathology of Homicide.
6. Keith Simpson (1968). Medical Jurisprudence.
7. Taylor (1948). Principles and practice of medical jurisprudence.
8. Simpson's Forensic Medicine 13th Edition

(2)Course title: Community Medicine

Credit hours: 19

Contact hours: 225

Practical/Clinical Round: 90

Semester it is taught: SII&IV (Credit hours: 10, Contact hours: 120, Practical: 90)

SVII (Credit hours: 7, Contact hours: 75, Practical: 0)

S IX (Credit hours: 2, Contact hours: 2, Practical: 0)

Introduction

This course encompasses the principles of epidemiology, demography, biostatistics and research and their application in the health care delivery system for the betterment of community health at local, regional and international level.

The students will learn how to develop a research oriented perspective in solving health problems in the communities. They will also learn how to design disease prevention and control strategies, health education and promotion, surveillance and managing pandemics. The topics covered will include study design, measures of diseases occurrence and associations, diagnostic tests and demography.

Course Aim

To equip student with the foundation of the principles of epidemiology, demography, and biostatistics and health research and orientate them on data handling, data analysis and data interpretation, and research study design, research protocol implementation and scientific paper writing.

Learning outcomes /Course Objectives

On successful completion of the course the student should be able to:

1. Define measures of morbidity/mortality.
2. List and describe the sources of epidemiological data.
3. Describe, with suitable examples, Bradford Hills' criteria of disease causation.
4. Describe and illustrate natural history of a disease with suitable examples (communicable and non-communicable).
5. Collect relevant clinical, psychosocial information from a patient and family, analyze and present to illustrate the natural history of a common disorder.
6. Advise relevant (psychosocial, cultural and economic context) promotive, preventive, curative and rehabilitative measures for the disorder.
7. Describe the need and uses of screening tests.
8. Differentiate between screening and diagnostic tests.
9. Calculate the sensitivity, specificity, positive predictive value of tests given a set of data.
10. Describe the various types of epidemiological study designs, their application, and biases, statistical analyses, relative merits and demerits.
11. Define, calculate and interpret commonly used statistical methods.
12. Select and use appropriate diagrammatic representations of statistical data.
13. Define probability.
14. Define normal distribution.
15. Define bias, random error.
16. Describe methods of sampling and calculate sample size.
17. Carry out random and cluster sampling.
18. Describe the demographic pattern of the country.
19. Describe the sources of data and their merits for use and census in the Republic of South Sudan.
20. Describes statistics and its importance in medical practice
21. Informs public health decisions using applied statistics
22. Uses basic statistical approaches as applied to the medical field
23. Formulates an appropriate hypothesis
24. Selects an appropriate statistical test to test the hypothesis.
25. Uses statistical packages
26. Describe the common industrial and occupational diseases.
27. Describe the feasible methods of control of occupational diseases.

28. Describe the important features of the Workman Compensation Act and provision of health services and health insurance to industrial workers.

29. Describe the organization of health services at all levels and the School Health Programme.

30. Describe the concepts, components, principles of primary health care.

31. Describe natural and man-made disasters and disaster management.

32. Functions of various categories of workers at PHC.

33. Appreciate cost considerations in clinical and public health interventions.

Competencies

1. Define epidemiology.
2. Understand the main principles of epidemiological research
3. Develop and implement a research proposal
4. Plan an epidemiologic study
5. Critically assess different research design
6. Familiarise with data analytic software SPSS, STATA etc…..
7. Interpret results from epidemiological studies
8. Apply knowledge of epidemiology to community health.

Course content:

1. Definitions and key concepts in epidemiology
2. Definitions, scope in hospital, community, planning
3. Measures of morbidity/mortality
4. Rates: incidence, prevalence
5. Death rate
6. Crude rates/standardized rates
7. Fertility rates
8. Person years
9. Ratio
10. Proportions
11. Risk
12. Sources of epidemiological data
13. Causation of disease
14. Natural history of disease for communicable and non-communicable diseases.
15. Levels of disease prevention
16. Clinico-psycho-social case review
17. Principles of control of communicable disease
18. Principles of control of non-communicable disease
19. Measurement
20. Screening Tests
21. Diagnostic Tests
22. Cross sectional and case control studies
23. Longitudinal study
24. Case control study

25. Control trials
26. Measures of disease occurrence
    - Prevalence
    - Incidence
    - Attack rate
    - Case-fatality Rate
    - Adjusted measures.

27. Epidemiologic study design
    - Case control
    - Cohort
    - Cross-sectional studies
    - Ecological studies

28. Experimental study designs
29. Randomized control trials

30. Field trials and communities.
31. Errors
    Random Error
    Bias
    Systematic error
    Confounding
    Control for Confounding
    Interactions

A. Epidemiology of Communicable Diseases and Non-communicable Diseases.

At the end of the course the student should be able to:

1. Describe the epidemiology of common communicable diseases.
2. Describe the epidemiology of common non-communicable diseases.
3. Describe the steps involved in investigating an epidemic.
4. Plan and investigate an epidemic of a communicable disease in a hospital/ community setting, and institute control measures.
5. Describe the immunization schedule and side effects of the immunizing agents.
6. Immunize a child.
7. Describe the cold chain and the importance of maintaining the cold chain.
8. Describe disease surveillance
9. Manage pandemics

Course Content

Concepts of Cause

1. Necessary cause
2. Disease surveillance
3. Introduction,
4. Disease investigation,
5. Surveillance methods.

Demography

1. Population distribution and population pyramids
2. Population growth
3. Measures in demography: fertility rates, Mortality rates, growth rates

Clinical Epidemiology

Introduction to Epidemiology
Diagnostic Tests
Characteristics of Screening Tests and Diagnostic Tests
Sensitivity, specificity, predictive value and likelihood ratios
Measuring Health & Disease
Measuring disease frequency
Using available information to measure health and disease
Death rate

Discuss the epidemiology of communicable and non-communicable diseases:

1. Malaria
2. STDs / HIV/AIDS
3. Pulmonary Tuberculosis
4. Leprosy
5. COVID-19, Zika, respiratory viruses (SARS-CoV 2.MERS, SARS)
6. Diphtheria, Pertussis, Tetanus
7. Poliomyelitis
8. Measles, Mumps & Rubella
9. Chicken, A.R.I.
10. Diarrheal Diseases

11. Infective Hepatitis
12. Kala azar
13. Arbo viral diseases
14. Filaria
15. Plague
16. Intestinal infestations
17. Investigation of an Epidemic
18. Immunity
19. Immunization schedule
20. Cold chain
21. Immunization for international travel
22. Surveillance of diseases
23. Nutritional disorders
24. RHD /CHD / hypertension
25. Cancers
26. Blindness
27. Road traffic accidents
28. Diabetes mellitus
29. Obesity

B. Biostatics

- Data and variables
- Descriptive statistics (tables, graphs, measurement of central tendency, measures of
- dispersion)
- Interval Estimation (confidence levels)
- Comparing means

Introduction to hypothesis Testing

a) Hypothesis formulation,
b) Significance level
c) Type-1 error
d) Type-2 error
e) Power of the test.

- T-test
- Chi-square test
- ANOVA
- Regression analysis
- Survival analysis
- Computer application (EPI Info and SPSS, STATA).
- Bio-statistics in medicine
- Statistical methods
- Frequency distribution
- Measures of central tendency.
- Proportions
- Tabular & diagrammatic presentation of data probability
- Normal distribution
- Standard error estimation
- Tests of significance
- Alpha, beta error
- Confidence interval
- Bias/random errors
- Sample size calculation
- Sampling methods
- Practical exercise in - random sampling - cluster sampling (EPI) Vital Statistics, census
- Measures of association and effects
  a) Odds ratio
  b) Incidence (incidence risk, Incidence rate)
  c) Attributable risk
  d) Attributable fraction
  e) Confidence levels

C. Occupational / Environmental Health

Content

1. Working environment, health hazards of industrial and agricultural workers
2. Common occupational lung diseases
3. Common occupational skin diseases and cancers
4. Principles of prevention of occupational diseases
5. Legal status in relation to Workman's Compensation Act
6. Employees' State Insurance Act
7. Practical exercise - visit to a factory
8. Foundational concepts and strategies for environmental and occupational health sciences and how they apply in different situations at varying scales
9. Hazards to health: chemical, microbial, physical health hazards (in air,water,food, soil,and waste),interactions with biological genetic and health determinants.
10. Effect of cycles: nutrient, energy, hydrological in terms of sustainability and system dynamics
11. Nutrition: nutrition and malnutrition, energy balance, function of micronutrients, linkage between nutrition and health
12. Exposures: identification of strategies, evaluation, preventing and controlling exposures to health and safety hazards in occupational and environmental settings
13. Health risks: strategies to assess and ameliorate acceptable levels of environmental health risks
14. Vulnerability: factors affecting individual and population (biological susceptibility, health or social disparities, cumulative health impacts
15. Values: equity, justice sustainability in issues related to health and the environment
16. Context: i). Environment: changing status of the natural ecosystem, human-altered environments, global-scale pollution, human global environmental damage on health, well-being and equity.
    ii) Systems: scope, scale, and dynamics of major systems on environmental health and their impact
17. Social context: Interaction of socioeconomic, political, cultural, behavioural and perceptual factors interact with environmental factors and affect health risks
18. Systems thinking: Relationships between structure and dynamics, environmental hazards, social context, vulnerability on health, wellbeing, equity
19. Food systems: Food production and distribution system food environment, food security
20. Stakeholders : power and inequities, needs, concerns, risk perceptions
21. Energy and human health; ethics of environmental and occupational health (EOH),EOH disciplines (toxicology, epidemiology, exposure science,), ambient air pollution, pests and pests control, water and health, lead hazards, hazardous waste, food systems, nature and health, EOH disparities

D. Health Administration

Content

1. Planning and organizational set up of health services in South Sudan
2. Primary health care
3. Health team at District Hospital, Community Health Primary Health Centre
4. School health
5. Management of health resources
6. Voluntary and international agencies in health care
7. Natural and manmade disasters and disaster management

E. Health Economics

Content

1. Need of health economics
2. Methods of economic analyses in health

F. Health Research Ethics

1. The Role of Research Ethics Committees/Institutional Review Boards (IRBs)/National Research Ethics Council
2. Declaration of Helsinki
3. Informed consent
4. Conflict of interest
5. Benefit of the subjects

6. Risks disclosure
7. Academic fraud and plagiarism
8. Belmont Report
9. Nuremburg Declaration

G. Reproductive Health

Methods Teaching/Training

Lectures
Computer labs for data analytic software programs and dummy Data sets.
Group work
Individual projects
Seminars
ICT/Web-based learning
Lectures
Self-study
Seminar
Problem-Based Learning
E-Learning

Assessment Methods:

Continuous Assessment:	**40%**
Assignments:	10%
Group work and presentation:	10%
Written tests:	20%
Final Examination -	**60%**
Written Papers: ……..	60%

Recommended Books

1. Friis, R. (2010), Epidemiology 101 (Essential Public Health). Jones & Bartlett Publishers.
2. CDC guide, Principles of Epidemiology 2nd Ed.
3. Bonita R., Beaglehole R. and Kjellstrom T. (2006). Basic Epidemiology 2nd Edition.
4. T. Kue Young. (1998) Population Health: Concepts & Methods. Oxford University Press, USA; 1st edition. ISBN-10: 019511972X | ISBN-13: 978- 0195119725.
5. R. Beaglehole, R. Bonita, T. Kjellström, (2007) Basic Epidemiology, World Health Organisation; London. ISBN-10: 9241547073 | ISBN-13: 978- 9241547079 available on line
6. Kenneth J. Rothman, Sander Greenland Timothy L. Lash,
7. Modern Epidemiology (2008), Baltimore, Saunders Elsevier. ISBN-10: 0781755646 | ISBN-13: 978-0781755641.
8. Antony Stewart, Klim McPherson Basic Statistics and Epidemiology: A Practical Guide. (2007). Radcliffe Medical Press; ISBN-10: 1846191963 | ISBN-13: 978-1846191961.
9. Robert R. Sakal and F. James Rohlf (2009). Introduction to Biostatistics 2nd Ed. Dover Publications, Inc. Mineola, New York
10. Larry Winner (2004). Introduction to Biostatistics. Department of Statistics University of Florida.
11. Charles H. et al., (2007). Understanding Basic Statistics. 4th Ed. ISBN13: 9780618632275; ISBN10: 0618632271.
12. Park, K. (1997), Preventive and Social Medicine, M/s Banarsidas Bhanot Publisher Jabalpur India.
13. Andre Francis (2004) Business Mathematics and Statistics (6th Edition) Notingham: Thomson.
14. Johan Giesecke (1994) Modern Infectious Disease Epidemiology London Oxford University Press
15. Hardon, Anita et al. (1995) Applied Health Research Manual, Anthropology and Health Care (2nd Edition), Netherlands CIP-DATA KONKLUKE BIBLIOTEEK, DEN HAAG.
16. Saunders, Mark, Lewis Philip and Thornhill Adrian (2003) Research Methods for Business Students (3rd E London: Financial Times Prentice Hall.
17. Vaughan J. P. Manual of Epidemiology for District Health Management (1989) Geneva World Health Organisation.
18. CIOMS WHO, International Ethical Guidelines for Biomedical Research involving Human Subjects, (1983) Geneva, WHO.
19. Park K (1997). Preventive and Social Medicine. MS Banarsidas Bhanot Publisher Jabalpur.India
20. Vaughan JP. Manual of Epidemiology for District Health Management (1989), World Health Organisation, Geneva.
21. MacDonald E (Ed). Difficult conversations in medicine. Oxford University Press.

Journals

1. American journal of Epidemiology
2. Journal of Epidemiology
3. Journals to be advised by course tutors

Websites

1. www.academic.com.pup.com-aje
2. www.journals.elsevier.com
3. www.CDC.Journals of Epidemiology

INTRODUCTION TO RESEARCH AND RESEARCH CONCEPTS

1. Nature of research
2. Philosophical mode of research
3. Role of theory in research
3. Types of Research

A. Planning and Conducting Research

1. Steps in planning research
2. Steps in conducting research
3. Problems in planning and conducting research

B. Identifying Research Problem

1. Nature and origin of research question
2. Criteria for a research question
3. Problem identification and formulation
4. Sources of research problems
5. Ethical issues in research

C. Literature Review

How to conduct literature review

D. Research Proposal and Report Writing

Students are divided in groups where they develop the proposal, collect and analyse data and finally write a report/research article.

E. Designing and Executing a Research Study

i) Classification of research designs

Surveys and clinical measurements
Experimental, evaluation research and some qualitative designs

ii) Basic elements of research design

Case Series
Cross Sectional Studies
Case-Control Studies
Cohort Studies
Intervention studies (including randomised controlled trials) Follow-up patients in longitudinal studies
The design of documentation for recording survey data.

iii) Sampling

Introduction to sampling
Strategies for statistical representativeness.
Strategies for theoretical representativeness.

Sampling error

iv) Describing Clinical Data

The variables
Variation in clinical data
Describing grouped data
Choosing appropriate descriptive statistics
Data collection methods

v) Validity and Reliability of Data

Fundamental definitions
Forms of validity
Forms of reliability
Construction of valid questionnaires
Methods for validating observational techniques

vi) Analyzing Quantitative Data

Basic concepts for inferential statistics
Statistics
Population and sample
Type of measurement scale
Frequency distribution and graphic presentation of data
Measures of central tendency
Measures of dispersion (Variability)
Correlation: Scatter diagram, correlation of ranked data etc.
Statistical distribution
Estimations and confidence intervals
Hypothesis testing procedure
Application of confidence intervals and hypothesis testing
Random and non – random sampling
Definition and properties of probability
2 X 2 table
Rules of probability

Vii) Ethics in Conducting Research

Ethical consideration in research design.
Ethics, governance and data protection
Good Clinical Practice and informed consent
Why should research be ethically regulated?
What makes research ethical?
Protecting participants individually and collectively
Researching vulnerable groups and sensitive issues
Research in developing countries

Recommended Text Books

1. DePoy E, Girtin LN (2005) Introduction to Research. 3rd Edition. London: Mosby.
2. Diamond, I. and Jefferies, J. (2002) Beginning Statistics: An introduction for social scientists. London: Sage Publications.
3. Aggrawal,Y. P. (1998). Statistical methods: concepts, application and computation. New Delhi: Sterling Publishers Private Limited.
4. Sim J, and Wright C (2000) Research in Health Care – Concepts, Designs and Methods. London: Stanley Thornes Ltd.

Health Care Evaluation and Health Needs Assessment

The uses of epidemiology and other methods in defining health service needs
Study design for assessing effectiveness, efficiency and acceptability of services including measures of structure, process, service quality, and outcome of health care
Measures of health status, quality of life and health care
Population health outcome indicators
Clinical audit

Confidential enquiry processes

1. Management

Definition of management
Theories of management
Fredrick Taylor – Scientific Management
Elton Mayo

2. Management/Leadership Functions

Planning
Organizing
Command
Coordinating
Control
Delegation
Decision making
Budgeting
Communication

3. Management team (team building)

4. Resource management

Human
Material
Financial
Time Management

5. Managing meetings

Types of meeting
Benefits of meetings
Presentation Skills
Preparing content
Preparing Visual Aids
Preparing for Delivery
Presenting

6. Theories of motivation

Abraham Maslow's Hierarchy of needs
Douglas McGregor Theory X and Theory Y

7. Management of change

Introduction
Factors contributing to accepting change
Why people resist change

8. **Performance appraisal**

Introduction
What performance appraisal is?
Types of appraisals
Benefits of appraisals
Tools used in appraising

9. Organisational culture

Introduction
Exploring organisation culture
Types of organisation culture
Evaluation concept of culture
Conclusion

10. Leadership

Definition
Major theories
Overview of Leadership approaches

Conventional Traits and styles.

11. Discipline

Definition
Grievance procedure
Disciplinary procedure
Disciplinary code and procedure for handling offenses

12. Information system

Definition
Types

13. Management Information Systems (MIS)

Introduction
Data and information
Qualities/characteristics of data
Statistical Software
Epi-data; Epi-Info; SPSS; STATA
Qualitative software: NVIVO

14. Levels of Management of Information

Operational
Tactical
Strategic

15. Health Management Information System (HMIS)

Introduction to South Sudan HMIS (Inclusive of hands on practicum)
Smart care (Including hands on Practicum)
Teaching Methods
Lectures
Demonstrations
Group Discussion
Role plays
Tutorials
Case studies
Questions and answers

Assessment Methods

Continuous assessment:		**40%**
	Assignments	10%
	Written tests (2)	30%
Final examination:		**60%**

Written examination:

Paper I (MCQ)	25%
Paper II (Essays)	35%

Recommended Book List

a) Health Care Ethics

1. Moral Issues in Health Care: An Introduction to Medical Ethics. New York/London: Wadsworth Publishing Co. McConnell T. (1997).
2. Campbell, A., and others (1997) Medical Ethics. Oxford: Oxford University Press.
3. Kenneth Kearon (1995) Medical Ethics: An Introduction. Dublin: Columbia Press.
4. Intervention and Reflection: Basic Issues in Medical Ethics. New York: Wadsworth Publishing Co. Munson, Ronald (1996).

b) Management

1. HoH D.H. (1987) Management Principles and Practice. New Jersey Prentice Hall Inc.
2. Cole A. (2002) Personnel and Human Resource Management. 5th Edition. London: Book Power.
3. Handy Charles B., (1976) Understanding Organisations. Oxford: Oxford University Press.
4. Armstrong M. (2004) A Handbook of Human Resource Management Practice. 9th Edition. London: Kogan Page.
5. Bless C., Kathuria R. (2001) Fundamentals of Social Statistics. An African perspective. Cape Town: Juta.
6. Chabner D. (2005) Medical Terminology: A Short Course. 6th Edition, London: Sanders.
7. Beauchamp T., Childress J. (1994). The Principles of Biomedical Ethics. Oxford: Oxford University Press.
8. Knapp G. R. and Millar C. M. III (1992) Clinical Epidemiology and Biostatistics. Baltimore: Williams and Wilkins.
9. Ivancevich J.M. (1998). Human Resource Management. 7th Edition: Boston: Mc Graw-Hill.

HEALTH CARE AND COMMUNICATION

Introduction

The relationship between health worker and patient has an important part to play in encouraging healthy behaviours. This relationship is affected by a number of factors including communication. A poor relationship between health worker and patient may lead to poor levels of adherence to treatment programs. To be able to communicate effectively with others is at the heart of all patient care, for if the health practitioner cannot identify problems accurately, care will be based on assumptions rather than on the expressed needs of the individual. Communication, therefore needs to be effective so that care can be planned on the basis of the patient's actual problems, rather than on what the health worker thinks are his/her problems.

Course Aim:

The course aims to provide the students with an understanding of the factors which influence effective communication between a doctor and a patient and to promote sensitivity to ethical and cultural issues in communication.

Learning outcomes/Course Objectives:

At the end of this course, the student should be able to:

1. Review the basic features of verbal and non-verbal communication
2. Evaluate the factors affecting communication
3. Practice communication skills in a safe environment
4. Differentiate skills required to communicate with different groups people
5. Evaluate the ethical issues in doctor patient relationship
6. Reflect on and improve one's communication skills

Course content:

Introduction

1. Basic communication skills (verbal, non-verbal skills)
2. Ethics-roles
3. Ethics in clinical practice
4. Power relationships
5. Role expectations

Factors affecting communication

1. Environmental factors
2. Doctor related factors - physical, psychological factors
3. Patient-related factors - physical, psychological factors

Gender and sexuality

1. Communicating with patient of opposite gender
2. Communicating with patient from different culture

History taking-

1. Taking medical history,
2. Taking social history
3. Taking sexual history

Giving information-

1. Guidelines on giving information to patient
2. Giving lifestyle advice

3. Use of written information
4. Obtaining informed consent

Breaking 'bad 'news

1. Why it is difficult to give 'bad' news
2. To whom should 'bad' news be given?
3. Who should give 'bad' news?
4. How to give 'bad' news
5. Responding to patients concern

Communicating with children and young people

1. Management of children
2. Modes of communication
3. Addressing children's feelings
4. Dealing with adolescents
5. Breaking 'bad' news to children
6. Referrals

Communicating with patients with special problems

1. Communicating with patients from different linguistic and cultural backgrounds (use of interpreters)
2. Communicating with patients family
3. Challenging consultations-
4. Difficult patients,

Teaching methods and contact time:

3 hours/week including:
Lectures Seminars
Group discussions
Project (evidence-based)-student presentation
Practical- role plays, problem solving, decision making
Case studies
Audio-visual feedback

Assessment methods

Continuous assessment -	**40%**
Reflective log/portfolio -	20%
Practical -	20%
Final Examination -	**60%**
Paper 1 - Essays and short notes-	30%
Paper 2 -Multiple choice questions-	30%

Recommended Text Books

1. Lloyd, M (2007) Communication skills for medical practice. Churchill Livingstone.
2. Silverman, J. (2006) Skills for communicating with patients. Radcliffe Publishing.
3. Faulkner, A. (2004) Effective interaction with patients. Churchill Livingstone.
4. Macdonald, E. (Ed) Difficult conversations in medicine. Oxford University Press.
5. Difficult consultations with adolescents and working with young people; Evidence based health communication and communicating health – Manual.

HEALTHCARE ETHICS

Course Aim

The aim of this course is to examine critically central issues concerned with health care ethics.

Learning outcomes/Course Objectives

By the end of this course, students are expected to be able to do the following:

1. Express an understanding of the nature of health care ethics;
2. Demonstrate knowledge of different ethical theories;
3. Demonstrate knowledge of different health care based code of ethics
4. Outline the major health care ethical issues;
5. Analyse critically principles used in ethical decision-making in health care issues;
6. Evaluate clinical situations and formulate an ethical position based on the principles of ethics and codes of ethics.

Course content

Philosophical Bases

1. Utilitarianism
2. Kantianism
3. Egoism
4. Deontology

Values in health care ethics

1. Beneficence
2. Non-maleficence
3. Justice
4. Autonomy
5. Dignity
6. Truthfulness and honesty
7. Human rights and ethics

Ethical Codes

1. The Hippocratic Oath
2. World Medical Association Code of Ethics
3. Commonwealth Medical Association Code of Ethics
4. Declaration of Geneva of the World Medical Association
5. Medical Council of South Sudan Code of Conduct

Fundamental health care ethics

1. The doctor-patient relationship
2. Respect for autonomy
3. The patient's right to information
4. Informed consent
5. Confidentiality
6. Conflict of interest

Common Ethical Issues

1. Abortion
2. AIDS
3. Assisted procreation
4. Child abuse
5. Minors
6. Blood transfusion
7. Post-mortem
8. Euthanasia
9. Genetic manipulation
10. Experimentation on humans
11. Tissue and organ transplants
12. Priorities in health care
13. Right to life
14. Torture
15. Emergency treatment

16. Infamous conduct
17. Fitness to practice
18. Relationships with colleagues

Research Ethics

1. The Role of Research Ethics Committees/Institutional Review Boards (IRBs)/National Research Ethics Council
2. Declaration of Helsinki
3. Informed consent
4. Conflict of interest
5. Benefit of the subjects
6. Risks disclosure
7. Academic fraud and plagiarism
8. Belmont Report
9. Nuremburg Declaration

T**eaching Methods and Contact Hours**

Lectures – 1 hour/week
Student directed Seminars – 3 hour/week
Group discussions /debates
Guided reading

Assessment methods

Continuous assessment -	**40%**
Reflective portfolio/ log books -	20%
Practical -	20%
Final Examination -	**60%**
Paper 1 - Essays and short notes-	30%
Paper 2 -Multiple choice questions-	30%

Recommended Text Books

1. McConnell T. (1997). Moral Issues in Health Care: An Introduction to Medical Ethics, Wadsworth Publishing Co., New York/London.
2. Campbell, A., et al (ed.) (1997). Medical Ethics, Oxford University Press, Oxford.
3. Kenneth Kearon (1995). Medical Ethics: An Introduction, Columbia Press, Dublin.
4. World Medical Association Code of Ethics
5. Commonwealth Medical Association Code of Ethics
6. Declaration of Geneva of the World Medical Association
7. Helsinki of Declaration
8. Munson, Ronald (1996). Intervention and Reflection: Basic Issues in Medical Ethics, Wadsworth Publishing Co., New York/London.
9. Beauchamp, T., Childress, J. (1994). The Principles of Biomedical Ethics, OUP, Oxford.
10. Zucker, A. et al. (1992). Medical Ethics: A Reader, Prentice Hall, Englewood Cliffs, N.J.
11. Gillon, R. (1986). Philosophical Medical Ethics, Wiley & Sons, Chichester.
12. Banda, S.S (ed.) (1998). A Handbook of Medical Ethics for Medical Students and Health Professionals, Zambia Medical Association/UNFPA, Lusaka
13. Declaration of Geneva of the World Medical Association
14. Helsinki of Declaration

(3) FAMILY MEDICINE CLERKSHIP

Introduction

The course is based on the four principles of family medicine:

The Family Medicine Practitioner/Physician is a skilled clinician

Family Physician Demonstrates competence in the following aspects:

1. Patient-centred clinical methods
2. Provides information to patients:
3. Respecting autonomy of the patient
4. Empowers patient to take control of their own healthcare needs
5. Decisions are made in the best interests of the patient
6. Have expert knowledge of the common health problems in that community
7. Expert knowledge of life threating and treatable emergencies in that community

Family Medicine is a Community-Based Discipline

1. Being based in the community the practice is influenced by community factors
2. Presenting clinical problems are not pre-selected, giving a wide range of problems
3. Clinical problems present when they are at various stages of development
4. Patients are cared for in the practice office, hospital, health care facilities, home
5. Referrals and community resources are used judiciously

The Family Medicine Physician serves a defined population

1. The practice ensures that the health of the community is maintained
2. Have strategies for self-directed, lifelong learning
3. Have responsibilities for advocating policies that promote the community's health
4. Responsible for wise stewardship of the scarce resources

The patient-physician relationship

1. This is the central role of the family physician
2. Has an understanding and appreciation of the human condition
3. Understands the nature of suffering of the patient
4. Respects the privacy of the person
5. Appreciates the power differential between doctors and patients
6. Mindful of the potential of abuse of the power

Aims of the course

1. To enable students develop the knowledge, skills and attitudes necessary to manage common family medicine problems in the office, community and acute care settings.

Learning Outcomes/Learning Objectives

On successful completion of the course the student should be able to:

1. Demonstrate knowledge of disease processes:
   - -Undifferentiated presentations
   - -Differential diagnoses
   - -Diagnostic confirmations and management
2. Differentiate between seriously ill patients and minor conditions an instituting appropriate management: telephone triage, referring, consulting
3. Perform procedural skills specific to family medicine
4. Provide continuity of care in the community, advocacy, coordination, and inter-professional collaboration
5. Consideration of cost effective care decisions: hospitalisation, test utilisation and billing
6. Demonstrate knowledge of community resources available for support: patients, other healthcare professionals, support groups and agencies
7. Incorporation of appropriate health promotion and disease prevention (lifestyle assessment), screening and education
8. Practise continuing education, self- assessment, information accessing, and critical appraisal in assessing new knowledge before adopting it
9. Effective documentation of medical records: clear, concise, accessible
10. Utilisation of patient-centred approach to care of patients and families, experience of the disease and illness, understanding the whole person and arriving at management with the patient

11. Demonstrate an ethical approach to the patient-doctor relationship, respect, non-judgemental
12. Demonstrate time management skills by setting priorities, solution-focused, efficient and comprehensive

Teaching Methods and Contact Hours

40 hours/week x 8 weeks= 320 hours

Assessment Rationale:

Assessed on knowledge of applied basic and relevant clinical sciences, clinical competence, and professionalism and ethics.

Continuous assessment - 40%
Final examination (written and clinical) - 60%

Recommended Text Books

1. Rakel R, Rakel D. (2015). Textbook of Family Medicine (9th Edition). Saunders. ISBN-13: 978-0323239905, ISBN-10:0323239900.
2. Etherick J, Slater ED, David J (2018).Current Practice Guidelines in Primary Care (16th Edition). McGraw Hill Education/Medical. ISBN-13: 978-1260031065, ISBN-10: 1260031063.
   Journals and Websites to be advised by the course lecturer

(5)Course title: Orthopaedics and Traumatology

Credit hours: 6

Contact hours: 60

Practical/Clinical Round: 90

Introduction: The course offers a foundation in Orthopaedics and Trauma to enable the student to be able to diagnose orthopaedic and trauma conditions and be able to carry out investigations and management at the level of a general practitioner.

Course aim: To impart to the students the knowledge, skills and attitudes in orthopaedics and trauma at the level of entry to internship

Learning Outcomes/ Learning Objectives

On completion of the course the student should be able to:

1. Describe the surgical anatomy of the musculoskeletal system.
2. Perform a targeted musculoskeletal physical examination: muscles, bones and joints.
3. Perform neurological evaluations including joint motion, reflexes and muscle power.
4. Order and interpret radiological imaging
5. Describe the available radiological techniques and their indications.
6. Ability to handle emergencies in orthopaedics and trauma
7. Ability to demonstrate professional and ethical manners in handling patients and their relatives: empathy, compassion, altruism, confidentiality, respect, autonomy, obtain consent
8. Outline the aetiology, pathophysiology and clinical presentation of common Orthopaedic and Trauma conditions
9. Make differential diagnosis and select the most appropriate initial investigations
10. Set priorities and plan management of the critically injured patient
11. Perform a screening examination (gait, arm, leg, and spine
12. Examine an acutely injured patient, including a focused neurological examination interpreting the findings to the history obtained
13. Thorough examination of the following: spine, hip and pelvic, knee, ankle and foot, shoulder, elbow, wrist and hand
14. Knowledge and clinical presentation of pathological conditions in orthopaedics
15. Ability to identify pathology based on anatomical location
16. Knowledge of common pathologies in orthopaedics
17. Knowledge and skill in surgical and non-surgical management of orthopaedic conditions

Traumatology

1. Able to classify fractures, dislocation, ligamentous and muscular injuries.
2. Understand the process of bone healing.
3. Diagnose and formulate management of spinal trauma, paraplegia, quadriplegia and physiotherapy.
4. Diagnose and outline concomitant injuries to head, thorax, abdomen and pelvis including the gastrointestinal and genitourinary system and refer appropriately
5. Describe upper and lower limb injuries, compartment syndrome, fat embolism, pulmonary embolism.
6. Ability to insert and remove Plaster of Paris and enumerate its indications, technique and complications.
7. Knowledge of amputations and rehabilitation post-surgery
8. Examine, diagnose, and manage infective conditions of bone and joints: septic arthritis, osteomyelitis, and pyomyositis.
9. Diagnose and manage affections of epiphyses and soft tissue.
10. Explain the principles of emergency limb re-alignment
11. Procedures requires in the emergency setting of limbs: realignment, splinting.
12None-surgical management and surgical management
14. Outline immobolisation techniques
15. Splinting, skin traction, skeletal traction
16. Apply casts

Laboratory Investigations

Perform pre-operative basic tests such as:
1. Full blood count;
2. Urea electrolytes;
3. Liver function tests;
4. Urinalysis;
5. Bacterial cultures;
6. Cerebrospinal fluid analysis;
7. Fine Needle Aspiration (FNA).

Surgical Radiology

Interpretation of radiographs of the:
1. Chest;
2. Abdomen;
3. Skull;
4. Spine;
5. Limbs.
6. Pelvis

Indications for radiological imaging

1. Indications and interpretation of contrast studies.
2. Ultrasonography.
3. Current advances in diagnostic imaging.

Course Content

Assessment of the patient: history taking, physical examination, appropriate investigations, effective communication.

Examination:

Extremity/regional examination: spine, hip and pelvis, knee, ankle and foot, shoulder, elbow, wrist and hand

Pathological processes:

Traumatic
Infective
Vascular/ischaemic
Inflammatory
Inherited (congenital)
Neurological

Neoplastic
Degenerative
Autoimmune
Metabolic (endocrine/drugs)
Idiopathic
Autoimmune/connective tissue disorder
Lupus
Scleroderma
Dermatomyositis
Psoariatic arthritis
Spondyloarthropaties
Rheumatoid arthritis
Juvenile idiopathic arthritis
Gout
Conditions by specific anatomical region
Hip
Degenerative joint disease
Greater trochanteric bursitis
Sacroiliac (SI) joint dysfunction
Transient synovitis of the hip
Knee
Degenerative joint disease/osteoarthritis
Meniscus tears
Anterior cruciate ligament (ACL) tear
Posterior cruciate ligament (PCL) tear
Medial collateral ligament (MCL) tear
Osgood- Schlater's disease
Illotibial band syndrome (ITBS)
Patellofemoral pain syndrome
Shoulder
Rotator cuff pathology (tear, strain,tendinopathy)
Impingement syndrome/ subacromial bursitis
Adhesive capsulitis
Degenerative joint disease/ osteoarthritis
AC joint degenerative joint disease/ osteoarthritis
Biceps tendinopathy
Elbow
Lateral epicondylitis
Medical epicondylitis
Olecranon bursitis
Ulna nerv entrapment (cubital tunnel syndrome)
Wrist/Hand
Carpal tunnel syndrome
Wrist ganglion
Dequervain's tenosynovitis
Dupuytrens contracture
Carpometacarpal arthritis
Trigger finger
Ankle/Foot
Bunions/hallux valgus/hallux rigidis
Plantar fasciitis
Achilles tendinosis
Morton's neuroma
Claw toes

Disorders of longitudinal medial plantar arch (e.g. Pes planus, pes cavus)
Club foot
Spine
Low back pain
Degenerative disc disease
Spondylolysis/spondylolisthesis
Scoliosis
Nerve root entrapment/sciatica
Prolapsed disc disease
Lumbar spinal stenosis

General

Osteomyelits
Septic arthritis
Pyomyositis
Necrotising fasciitis
Limb gangrene
Diabetic septic foot
Musculoskeletal oncology
Bone tumours
Benign bone tumours
Malignant tumours
Primary tumours
Metastatic tumours

Orthopaedic trauma

Emergency conditions
Compartment syndrome (any site)
Neurovascular injury (any site)
Septic arthritis
Open fracture
Cauda equina
Dislocation (any joint)
Physiological response to trauma
The limping child
Assesment/management of pathological fractures

Regional Pathology

Pelvis, Hip, Femur
Pelvic fractures
Acetabulum fracture
Fracture head of femur
Fracture neck of femur
Intertrochanteric fracture femur
Femur shaft fracture
Supracondylar fracture femur
Hip dislocation

Knee/Patella

Patella fracture/ dislocation
Patella/ quadriceps tendon rupture
Meniscus tear
ACL tear
PCL tear
MCL tear

Tibia

Tibia plateau fracture
Tibia shaft fracture

Distal tibia fracture
Tibia pilon fracture
Fibula

Ankle/Foot

Ankle fracture/ dislocation
Talus/Calcaneal
Metatarsal stress fracture
Lisfranc injury Achilles tendon rupture

Shoulder

Dislocation
AC joint separation
Clavicle fracture biceps tendon rupture

Elbow

Dislocation of elbow
Olecranon fracture
Radial head fracture
Fracture both bones of forearm
Monteggia fracture
Galeazzi fracture
Colles' fracture

Wrist/hand

Distal radius fracture
Scaphoid fracture
Metacarpal/phalangeal fractures
Tendon injuries

Management

Surgical and non- surgical
Splinting: principles of splinting
Plaster of Paris
Fibreglass
Preformed splints
Splinting techniques: advantages and disadvantages of backslab and full cast
Safe splint removal
Plaster casting
Hip spica
Type of casts
Circular cast
Knee cylinder cast
Long and short arm cast
Long and short leg cast
U-shaped arm cast
Mechanical traction
Skin traction
Skeletal traction
Gallow's traction
External fixation

Indications
Complications
Non-surgical Management
Non-operative management for common musculoskeletal conditions
Benefits and limitations
Pharmacological
Physical: physiotherapy, rest, exercise
Supports and aids (sticks, home modification)
Nutritional (weight loss etc)
Psychological
Surgical management
Elective common orthopaedic surgical procedures
Indications, potential benefits, risks and results for:
Arthroplasy: total hip and knee replacement
Arthroscopy
Meniscetomy
Anterior cruciate ligament reconstruction
Simple shoulder procedures
Tendon repairs
Wound management and debridement
Nerve decompression (carpal tunnel etc)
Common trauma procedures
Indications, potential benefits, risk and results
Open and closed reduction
Wiring, plating, intramedullary nailing, joint replacement, dynamic hip screw, hemiarthroplasty for hip fracture
Paediatric Orthopaedics
Trauma
Epiphyseal plate injury
Child abuse
Slipped capital femoral head
Supracondylar fracture of the humerus
Forearm facture
Tibia fracture
Proximal femoral focal deficiency
Congenital disorder: CTEV, vertical talus, DDH, metatarsal varus, Blout diease
Spine
Prolapsed disc disease
Lumbar spinal stenosis
Cauda equina
Spinal infections eg. Pott's disease
Metastatic spinal cord compression
The painful spine in the child

Complications of fractures
Non/mal/delayed union
Myositis ossificans
Growth arrest
Pressure sore

Outcomes of this course

The purpose of this document is to help medical students in their orthopaedics and trauma coursework. It will also help the teaching staff determine the learning outcomes. The overall objective is to equip medical students with the knowledge and skills necessary for them to practice at an intern level. We aim to avoid unnecessary material that the

student may not need as an intern or general practitioner or those ones that are essential for residency level practitioners.
On qualification, a doctor should be able to:

- Outline the aetiology, pathophysiology and clinical presentations of common orthopaedics and trauma conditions.
- Make a differential diagnosis and select the most appropriate initial investigations.
- Set priorities and plan management of the critically injured patient.

There are several broad sections:

1- **Assessment of the patient**
2- **Conditions related to specific anatomical regions**
3- **Common treatment modalities and experience of specific musculoskeletal procedures**

1. Assessment of the Patient

On qualification, the intern should be able to:

1. Elicit an accurate and problem-focused musculoskeletal history.
2. Undertake a targeted musculoskeletal physical examination.
3. Select the most appropriate initial investigations.
4. Make an appropriate differential diagnosis based on these findings
5. Communicate findings efficiently.

Examination

On qualification, the intern should be able to:

1. Perform a screening examination e.g. GALS (Gait, Arms, Legs, Spine)
2. Examine major joints and spine, including specific tests for pathology.
3. Examine an acutely injured patient, including a focused neurological examination.
4. Interpret findings elicited and relate them to the history.

Extremity/regional examinations to include:

- Spine
- Hip and pelvis
- Knee
- Ankle and foot
- Shoulder
- Elbow
- Wrist and hand

2. Conditions Related to Specific Anatomical Regions

On qualification a doctor should be able to identify pathology, based on anatomical location. By necessity this list is long but not exhaustive. Doctors should have some knowledge of all of the common conditions detailed below.

1. Orthopaedic Conditions

a. Orthopaedic manifestations of Sickle Cell Anemia
b. Orthopaedic Infections

- Osteomyelitis
- Septic Arthritis

c. The Limping Child Hip Conditions

- Developmental Dysplasia of the Hip
- Perthe's Disease
- Slipped Femoral Capital Epiphysis
- Transient Synovitis
- Infantile Coxa Vara

d. Assessment/Management Of Pathological Fractures

e. Hip

- Degenerative joint disease (DJD)
- Greater trochanteric bursitis
- Sacroiliac (SI) joint dysfunction
- Transient synovitis of the hip

f. Knee

- Degenerative joint disease/osteoarthritis
- Knee Sprain
- Osgood-Schlatter's disease
- Iliotibial band syndrome (ITBS)
- Patellofemoral pain syndrome

g. Shoulder

- Rotator cuff pathology (tear/strain/tendinopathy)
- Impingement syndrome/subacromial bursitis
- Adhesive capsulitis
- Degenerative joint disease/osteoarthritis
- AC Joint degenerative joint disease osteoarthritis
- Biceps tendinopathy

h. Elbow

- Lateral epicondylosis
- Medial epicondylosis
- Olecranon bursitis
- Ulna nerve entrapment

i. Wrist/Hand

- Carpal tunnel syndrome
- Wrist ganglions
- DeQuervain's tenosynovitis
- Dupuytrens contracture
- Carpometacarpal arthritis
- Trigger finger

j. Foot and Ankle

- Bunions
- Plantar fasciitis
- Achilles tendinosis
- Morton's neuroma
- Disorders of longitudinal plantar arch (e.g., Pes Planus, Pes Cavus)
- Club Foot

k. Spine

- Low back pain

- Degenerative disc disease
- Spondylolysis/listhesis
- Kyphosis and Scoliosis
- Nerve root entrapment / sciatica
- Disc Prolapse
- Lumbar Spinal Stenosis
- Spinal infections
- Metastatic spinal cord compression
- The painful spine in the child

2. Trauma Conditions

On qualification, a doctor should be able to recognise musculoskeletal conditions which are life or limb threatening and institute the appropriate management. These include but not limited to

a. Compartment syndrome (any site)
b. Neurovascular injuries (any site)
c. Open fractures
d. Dislocations
e. Physiological response to trauma

Regional Trauma Conditions

a. Hip
- Fractured neck of femur
- Pelvic and Acetabular Fractures
- Hip dislocations

b. Femur Fractures
- Intertrochanteric femur fracture
- Subtrochanteric femur fracture
- Femur shaft fractures
- Distal Femur fractures

c. Knee
- Knee dislocations
- Meniscus tears
- Anterior cruciate ligament (ACL) tear
- Medial collateral ligament (MCL) sprain
- Patella fracture

d. Tibial Fractures
- Tibial Plateau fractures
- Tibial Shaft Fractures
- Tibial Pilon fractures

e. Shoulder
- Dislocation
- AC joint separation
- Clavicle fracture and SC joint dislocation
- Biceps tendon ruptures

f. Elbow
- Dislocation
- Olecranon fracture
- Radial head fracture
- Medial and lateral Humeral epicondylar fractures
- Distal humerus fractures

g. **Forearm**
- Both bone forearm fractures

- Galeazzi fracture dislocation
- Monteggia fracture dislocation
- Nightstick fracture

h. Wrist/Hand

- Distal radius fracture
- Lunate and Perilunate Dislocations
- Scaphoid fracture
- Metacarpal / phalangeal fractures
- Tendon injuries

i. Ankle/Foot

- Ankle fracture
- Metatarsal stress fracture
- Lisfranc injury
- Achilles tendon rupture

j. Spine

- Spinal fracture
- Spinal cord trauma
- Cauda Equina Syndrome
- Conus Medullaris Syndrome

3. Common Treatment Modalities

On qualification, a doctor should be able to explain and demonstrate common treatment modalities including:

a. Simple practical procedures required in the emergency setting (limb realignment and splinting)
b. Non surgical management
c. Surgical management

Simple Practical Procedures

On qualification, a doctor should be able to know the following:

a. Limb realignment:

- Explain the principles of emergency limb realignment.
- Describe reduction of a long bone fracture and joint relocation procedures e.g. shoulder
- Outline immobilisation techniques

b. Splinting:

- Apply principles of splinting including
  - Plaster of Paris and fibreglass as well as pre-formed splints
  - Explain splinting techniques including the advantages and disadvantages of backslab and full cast
  - Safely use splint removal equipment

c. Non Surgical Management

On qualification, a doctor should be able to:

- Outline non-operative management options for common musculoskeletal conditions
- Explain potential benefits and limitations including
  - Pharmacological
  - Physical (physiotherapy, rest, exercise)

- Supports and aids (e.g. sticks, wheelchairs)
- Nutritional (e.g. weight loss)
- Psychological

d. Surgical management

On qualification, a doctor should be able to:

- Explain common elective orthopaedic surgical procedures
- Clarify indications, potential benefits, risks and results for:
    - Arthroplasty: total hip and total knee replacement
    - Arthroscopy
    - Tendon repair
    - Wound management and Debridement
    - Nerve decompression (e.g. carpal tunnel)
- Explain common trauma procedures
- Clarify indications, potential benefits, risks and results for:
    - Open and closed reduction
    - Wiring, plating, intramedullary nailing and joint replacement in trauma
    - Dynamic hip screw and hemiarthroplasty for hip fracture

Teaching / Training Methods and hours

40 hours / week x 8 weeks = 320 hours

Clinical rotations
Bedside teaching
Lectures
Tutorials
Seminars
Web / ICT learning

Assessment
Rationale:

Continuous assessment -	**40%**
Ward Attendances	
Portfolio	
Log Book	
Assignments	
Clinical (Long and Short Cases)	
OSCE	
Case Write up	
Final Examination (written and Clinical) -	**60%**
OSCE	
Long and Short Cases	
Written Papers	
MCQ	
EMG	
SBA	
Viva Voce	

Recommended Textbooks

- .Millis BB, Gaske GE. Trauma Management. 1st Edition.Thieme. ISBN-13:978-1626239180; ISBN-10: 1626239185:
- . Feliciano D, Maltox K, Moore E. Trauma. 9th Edition. ISBN-13.978-1260143348; ISBN-10: 1260143341
- Solomon, L., Warwick, D., Nayagam, S., **Apley's Concise System of Orthopaedics and Fractures**. 3rd ed. (2009). London: Hodder Arnold

- Liberman, J., **AAOS Comprehensive Orthopaedic Review**. 3rd ed. (2020). Wolters Klower
- Miller, M., Thompson, R., **Miller's Review of Orthopaedics**. 8th ed. (2021). Elsevier
- Gray, A., MacKenzie S., White, T., **McRae's Orthopaedic Trauma and Emergency Fracture.** 3rd ed. (2015). Elsevier
- McRae, R., **Clinical Orthopaedic Examination.** 6th ed. (2010). Churchill Livingstone

(6) Course title: Otolaryngology (ENT)

Credit hours: 3

Contact hours: 15

Practical/Clinical Rounds: 90

Introduction.

The course introduces the student to the principles of diagnosing, managing, and community education on conditions of the ear, nose and throat.

Course aim.

To acquaint the student with the diagnosis, management and community awareness of conditions that affect the ear, nose and throat region so as to be able to manage minor cases and referral to the ENT specialist for further management.

Course objectives/ Learning outcomes

At the end of the course, the student should be able to:

Knowledge

At the end of the course the student should have knowledge of:

1. The anatomy, physiology and biochemistry of the ear, nose and throat
2. Therapy of diseases of that region
3. Preventive measures of diseases of that region
4. Surgical and other modalities of treating disease of the ENT region
5. Instruments used in ENT examination and surgery
6. Surgical procedures in ENT: tonsillectomy, adenoidectomy, Caldwell- Luc, myringoplasty, modified radical mastoidectomy, biopsy of tongue carcinoma, direct laryngoscopy

Skills

At the end of the course the student should able to:

1. Examine, diagnose and manage common ear, nose and throat diseases at the primary care centre
2. Carry out common investigative procedures for common conditions
3. Assist the ENT specialist in carrying out surgical procedures such as tonsillectomy, mastoidectomy, septoplasty, tracheostomy and endoscopy.
4. Impart to the community preventive education on ENT conditions including cancer.

Attitudes:

1. Participate in caring for patients as an opportunity to observe the natural course of the disease and following up patients after instituting treatment
2. Recognise and develop an appreciation of the psychosocial impact of the disease on the patient and manage the patient accordingly.
3. Develop an appreciate the psychosocial effects on patients with ENT diseases
4. Appreciate the relationship between ENT diseases and other medical and surgical conditions and the psychosocial impact on the patient
5. Critically read the current literature regarding the specific conditions affecting one's patient. This will inculcate the student with the desire for lifelong learning
6. Have adequate knowledge available ENT therapies.
7. Communicate effectively with patients and colleagues

Course content

1. Applied anatomy and physiology of the ear, nose and throat
2. Clinical examination of the ear, nose and throat

A. Ear

1. Signs and symptoms of ear pathology
2. Investigations of a patient with ear condition

3. Acute and chronic conditions of the ear and their management
4. Facial nerve palsy in relation to pathology and trauma
5. Trauma
6. Perichondritis
7. Wax impaction
8. Otitis externa
9. Secretory otitis media
10. Acute suppurative otitis media, chronic suppurative media (safe and unsafe)
11. Benign and malignant tumours of the ear
12. Clinical examination of the ear

B. Nose and Pharynx

1. Clinical examination of the nose and pharynx
2. Investigation of the patient with conditions of the hypopharynx
3. Conditions of the nose and pharynx and their management
4. Conditions of the hypopharynx
5. Rhinosinusitis
6. Allergic and NAR rhinitis
7. Deviated nasal septum
8. Nasal bone fracture
9. Nasal polyp
10. Angiofibroma
11. Benign and malignant tumours
12. Chronic granulomatous disease (rhinospondiosis and atrophic rhinitis)

C. Oral cavity, oropharynx/nasopharynx

1. Adenoid hypertrophy
2. Tonsillitis
3. Tonsillar tumours
4. Nasopharyngeal carcinoma
5. Leukoplakia
6. Pharyngitis
7. Peritonsillar abscess and candidiasis
8. Salivary gland disease

D. Larynx/hypo pharynx/neck

1. Clinical examination of the larynx
2. Investigation of a patient with laryngeal conditions
3. Acute and chronic disorders of the larynx and their management
4. Laryngeal tumours and management
5. Stridor in infants, child, adolescent and adult
6. Inhaled foreign bodies
7. Emergency airway access (tracheostomy, cricothyroidotomy)
8. Medical conditions of relevance to ENT
9. Neck abscess
10. UAO
11. Vocal cord nodule
12. Recurrent juvenile papilloma
13. Carcinoma
14. Vocal cord palsy
15. Benign and malignant disease
16. Lymphadenitis, metastatic neck benign and malignant tumours
17. Brachial sinus

E. Emergencies

1. Upper airway obstruction
2. Foreign bodies in nose, ear, throat, tracheobronchial tree, oesophagus
3. Epistaxis
4. Neck trauma
5. Peritonsillar abscess

Teaching Methods and Contact Hours: **8 weeks**

Lectures
Seminars
Small group teaching
Clinical teaching: ENT outpatient clinics,
Ward round
Grand rounds
Operating theatre
Emergency sessions

Assessment Methods

Continuous Assessment: **40%**
Log Book:
Clinical Examination (OSCE)
Clinical cases
Class Tests:
Assignment:
Portfolio:

Final Examinations: **60%**
OSCE
Clinical case (short/long)
MCQ
Written Papers
EMQ
SBA

Recommended Text Books

1. Logan Turner .Textbook of ENT
2. Scott Brown's Otolaryngology- 5 Volumes
3. Dhingra PL. Textbook of ENT
4. Cumming Otolaryngology 7th Edition

(7) Course title: Ophthalmology

Credit hours: 3
Contact hours: 15
Practical/Clinical Rounds: 90

Introduction

The course is designed to give the student sufficient knowledge to enable recognition of common eye conditions along with their etiologic factors. The student should also know about the less common conditions but threatening the patient's sight. The student should also be able to execute the necessary action to safeguard the patient's life and maintain vision and function. Examination of the eye and adnexa is a component of the general examination of a patient. The eye may manifest some systemic diseases. Eye pathology is common in the ageing population.

Reduced visual function negatively impacts one's mobility, independence and psychological wellbeing.

A number of acute ophthalmologic conditions are readily treated if they present early and as treat or refer to specialists.

Course Aims:

To teach medical students sufficient ophthalmology to enable recognition of common eye complaints and their aetiology as well as recognition of less common but life-threatening emergencies presenting as eye findings.The student should be able to take the appropriate action to safe guard the patient's life, vision and overall function.

Learning Outcomes/ Course Objectives:

Upon successful completion of this course the student should be able to:

Knowledge:

1. Explain the basic sciences' (anatomy, physiology, biochemistry, pathology) roles in the signs and symptoms of disease in relation to the disease severity.
2. Explain the rationale for bedside laboratory investigations in formulating a diagnosis and the ongoing monitoring of the disease process.
4. Interpretation of laboratory results and other investigations to aid diagnosis and patient management.
5. Explain the therapeutic approaches in the management of diseases
6. Identify drugs that are used to treat common ophthalmic diseases
7. Develop the necessary skills to critically appraise the published literature before one applies the "new approach" on their patients.
8. Use information technology to access on-line medical information to support the education of the patient and the community.
9. Describe the presentation, clinical features, management and treatment of common ophthalmologic conditions: Cataract, primary open angle glaucoma, angle closure glaucoma, diabetic eye disease and retinopathy grading, dry and wet age related macular degeneration, retinal venous and, arterial occlusion, anterior ischaemic optic neuropathy
10. Describe the typical clinical features and explain the management of common causes of a red eye to include: eyelid disorders, conjunctivitis (bacterial, viral), refractive errors in adults, presbyopia, trachoma.
11. Describe clinical features and explain management of common conditions in infants and children including: sticky eye, refractive error, and amblyopia, strabismus awareness of emergency paediatric ophthalmic conditions such as non-accidental injury (NAI), retinoblastoma – and other causes of leucocoria.
12. Understand ophthalmologic complications seen in multisystem diseases and explain appropriate tests for screening and diagnosis, and ophthalmic interventions: diabetes mellitus, hypertension, HIV, multiple sclerosis, sarcoidosis and TB, rheumatology, thyroid disease, stroke, and giant cell arteritis.

13. Understand the detection and emergency management of: blunt and penetrating trauma, chemical trauma, orbital cellulitis.

14. Understand the common and relevant investigations performed in ophthalmology for diagnosis and treatment plans:

15. Describe the use of vital dyes and mydriatics to aid in diagnosis of ocular disease.
16. Outline the use of, ocular effect and systemic effect of the diagnostic topical medications; phenylephrine, cyclopentolate, atropine, cocaine, tropicamide
17. Understand the basic concepts of ophthalmic imaging including ultrasonography, fundus fluorescein angiography, optical coherence tomography, visual fields, biometry for cataract surgery and neuro-Imaging.
18. Recognise the more common procedures performed in ophthalmology: cataract surgery, retinal laser, intravitreal injections

Visual Impairment

1. Understand the role of inter-professional collaborative practice when delivering ophthalmic care.
2. Understand common causes of blindness and strategies of preventing blindness
3. Recognize the visual requirements for driving (visual acuity and visual Field)
4. Demonstrate an awareness of visual impairment and its implications to the individual, family and society.
5. Appreciate the value and implications of registration of the visually impaired.
6. Understand the concept of low visual aids.
7. Recognise the symptoms and signs of the following eye emergencies: cornea foreign body, corneal ulcer, chemical/caustic burns, acute closure glaucoma, lid laceration, hyphema, acute retinal vascular occlusion, retinal detachment, vitreous haemorrhage, papilledema, globe perforation, blunt injury of the eye
8. Perform ocular examination using the following: confrontation visual fields, pupil response (light and accommodation), examine everted eyelids for disease and foreign matter
9. Describe and explain the following and be able to explain to the patient: Horner's Syndrome, Adie's Pupil, Relative Afferent Pupil Defect and Argyll Pupil

10. Outline the use and systemic effects of diagnostic topical medications: phenylephrine, cyclopentolate, atropine, cocaine, tropicamide
11. Define Legal Blindness

Skills Objectives

At the end of the course the student should demonstrate competencies in the following skills:

1. Take an accurate, appropriate, and full ophthalmic history.
2. Conduct an appropriate physical ophthalmic examination.
3. Accurately elicit and interpret signs and symptoms of diseases
4. Accurately enter in the patient's records clearly and concisely written notes
5. Perform appropriate bedside therapeutic and diagnostic procedures
6. Institute basic life support
7. Use appropriate diagnostic approaches to formulate a diagnosis.
8. Carry out the necessary investigations to aid the formulating the diagnosis.
9. Formulate treatment plans for patients
10. Develop and execute a management plan.
11. Obtain information about the community from which the patient is coming from.
12. When possible information technology should be used to aid in diagnosis and patient education.
13. Make evidence-based decision based on up to date information in the medical literature

Attitudinal objectives:

At the end of the course the student should be able to demonstrate the following attitudes:

1. Respect patients and their families, peers and other members of the healthcare team
2. Prioritises the patient's welfare
3. Accepts full responsibilities for shortcomings she or he commits in the management of a patient and readily consults experienced senior colleagues.
4. Committed to lifelong learning by actively participating in continuing professional development
5. Promoting team working spirit
6. Demonstrate effective communication skills, caring, respective, ethical, professional, and compassionate behaviour when interacting with patients and their families.
7. Demonstrate a commitment to ethical principles with regards to providing or withholding clinical care, confidentiality of patient information, informed consent, and business practices.
8. Demonstrate sensitivity and responsiveness to patient's culture, age, gender, religion and disabilities
9. To practise interprofessional collaboration in delivering care to patients.
10. Develop lifelong learning skills by attending continuing education sessions and engage in self- directed study.
11. Exhibit good professional communication skills with the patients and their families, colleagues and other members of the healthcare team: verbal, written or by any other means
12. Educate and counsel the patient and family on the findings and what needs to be done.

Course Content

A. Basic Sciences

1. Head and neck
2. Orbit and eye
3. Cranial nerves and the eye
4. Visual pathway
5. Applied anatomy and physiology
6. Applied pathology, biochemistry, pharmacology, microbiology, parasitology, virology, 2

B. Ophthalmic Core

1. Acute visual loss
2. Chronic visual loss
3. Leucoria
4. Diabetic eye
5. Ocular manifestations of systemic disease
6. Ocular trauma
7. Optic disc swelling (papilledema, optic neuritis)
8. Amblyopia (refractive errors, strabismus)

C. Fundoscopy

D. Others

1. Eyelid abnormalities

2. Cornea Conditions
3. Retinal detachment
4. Pupil problems
5. Cranial nerve defects
6. Visual field defects

Teaching Methods

Clinical rotations
Bedside teaching
Lectures
Tutorials
Seminars
8 weeks
Web/ICT learning

Assessment Methods

Continuous Assessment -	**40%**
Log book	
Portfolio	
Class Tests	
Assignments	
Final Examination: Written and clinical-	**60%**
OSCE	
Written papers	
MCQ	
SBA	
EMQ	

Recommended Text Books

1. American Academy of Ophthalmology (2016). Basic Ophthalmology: Essentials for Medical Students (10th Edition). American Academy of Ophthalmology. ISBN-13-161525048, ISBN-10: 16152804043.
2. Trobe J, (2012). Physician's Guide to Eye Care (4th Edition).
3. American Academy of Ophthalmology. ISBN-13: 978-1615252817, ISBN-10:1615252819. Journal and Website from lecturer

(8) Course title: Anaesthesiology and Critical Care Medicine

Credit hours: 3
Contact hours: 15
Practical/Clinical Rounds: 90

Introduction

The course in anaesthesia has horizontal and vertical integrations with anatomy, physiology, pharmacology, general medicine, and general surgery with an emphasis of knowledge, skills and attitudinal issues.

Learning Outcomes/Course objectives:

At the end of the course the student should able to:

Knowledge Objectives

1. Anatomy of the airway and respiratory system
2. Fundamental techniques and skills
3. Accessing the airway in an emergency
4. Principles of fluid and electrolyte balance and therapy
5. Perioperative assessment and care of the patient

6. Principles of general and regional anaesthesia
7. Equipment for inhalational anaesthesia and post anaethesia and care unit
8. Commonly used drugs in anaesthesia
9. Administering of premedication
10. Anaesthesia paediatric and obstetric patient
11. Important medical conditions that affect anaesthesia
12. Preopertative assessment of a patient
13. Induction and maintenance of anaesthesia
14. Monitoring of a patient under anaesthesia
15. When to use the crush cart and its drugs
16. Regional anaesthesia/local anaesthesia (spinal, epidural, brachial plexus , peripheral nerve blocks,)principles, techniques, drugs, adjuvant agents
17. Identify and manage common emergencies in the operating room
18. Day care and anaesthesia outside the operating room
19. WHO surgical safety checklist
20. Describe ICU : criteria for admission, discharge, principles of monitoring
21. Basic setup of a ventilator
22. Assessment and management of an unconscious patient
23. Patient safety in operating theatre and ICU
24. Hazards of incorrect patient positioning
25. Common medical and medication errors in anaesthesia
26. Role of communication in patient safety
27. IV and CVC cannulation
28. Order and interpret appropriate radiologic and laboratory investigations preoperatively
29. Know the pharmacology of anaesthetic agents used in the different types of surgery

Skills

At the end of the course the student should able to:

1. Obtain accurate and complete medical and presenting complaint history from the patient
2. Correctly elicit physical signs of the disease condition from the patient
3. Manage common conditions
4. Chose and administer appropriate anaesthetic drugs and technique
5. Accurately monitor a patient under general anaesthesia
6. Recognise and manage complications of various anaesthetic agents
7. Care of the anaesthetised and unconscious patient
8. Able to administer and monitor fluid and electrolyte balance and therapy
9. 29. Explain the pharmacology of anaesthetic agents used in the different types of surgery
10. Basic life support
11. Perform CPR

Attitudinal Objectives

At the end of the course the student should able to:

1. Awareness of practising medical ethics when attending to patients
2. Appreciation of one's professional limits
3. Commitment to lifelong learning
4. Respect of the patient and other healthcare professionals in the team
5. Observe one's responsibilities, sense of duty, punctuality and accountability
6. Effective communication

Course content

1. Anatomy of the airway and respiratory system
2. Fundamental techniques and skills
3. Accessing the airway in an emergency
4. Care of the anaesthetised and unconscious patient
5. Principles of fluid and electrolyte balance and therapy
6. Perioperative assessment and care of the patient
7. Principles of general and regional anaesthesia
8. Equipment for inhalational anaesthesia and post anaethesia and care unit
9. Commonly used drugs in anaesthesia
10. Premedication

11. Paediatric and obstetric anaesthesia
12. Important medical conditions that affect anaesthesia
13. Preopertative assessment of a ptient
14. Induction and maintenance of anaesthesia
15. Monitoring of a patient under anaesthesia
16. Contents of a crush cart and their use
17. Regional anaesthesia/local anaesthesia (spinal, epidural, brachial plexus , peripheral nerve blocks,)principles, techniques, drugs, adjuvant agents
18. Common emergencies in the operating room
19. Day care and anaesthesia outside the operating room
20. WHO surgical safety checklist
21. Introduction to ICU : criteria for admission, discharge, principles of monitoring
22. Basic setup of a ventilator
23. Assessment and management of an unconscious patient
24. Patient safety in operating theatre and ICU
25. Hazards of incorrect patient positioning
26. Common medical and medication errors in anaesthesia
27. Role of communication in patient safety
28. IV and CVC cannulation

Anesthesia equipment and their physics.

A. Principles of gas preparation, analysis and storage, Venturi- principles.
B. Gas principles.
C. Anesthesia machine and vaporizers.
D. Basic principles of electricity, amplifiers and display devices.
E. Anesthesia circuits.

Teaching Methods and Contact Hours

Lectures, tutorials, seminars - 10 hours
Operating Room - 20 hours
ICU
Day case

Assessment Methods:

Continuous assessment:		**40%**
Log books, portfolio, case reports, etc) -	10%	
Clinical examination (OSCE) -	15%	
Oral-	5%	
Written: MCQ -	10%	
Final examination -		**60%**

Written Papers:
(Essays, MCQ, Short answer questions, SBA, EMQ)
OSEC, long case,

(9) Course title: Radiology and Medical Imaging

Credit hours: 3
Contact hours: 15
Practicals & Clinicals: 90

Introduction:
The course teaches students the radiological appearances of normal structures and appearances when affected by common diseases as displayed by imaging modalities such as plain film, ultrasound, computed tomography, magnetic tomography, magnetic resonance imaging, isotope imaging and angiography. They will also learn about the limitations of diagnostic radiology and the techniques that are used. It prepares newly qualified doctors with the necessary knowledge and skills to arrange for radiologic investigations and interpret the findings.
Course Aims

1. Develop skills to read plain radiographs, scans and other images so as to be able to distinguish between normal and abnormal structures
2. Be able to appreciate the indication and contraindication for radiographic investigations
3. Perform basic ultrasonography examinations
4. To impart the students with the ability to recognize and interpret the imaging findings in common diseases using different modalities and relate them to the clinical findings
5. Knowledge and ability to select the appropriate imaging tool for different clinical conditions.

Learning Outcomes/Course objectives:
Knowledge Objectives
At the end of the course the student should able to:

1. Understand normal functional processes in imaging
2. Relate radiologic reports to structures on images
3. Understand the clinical and technical aspects of radiology
4. Know and understand safety issues in radiologic clinical practice
5. Have an understanding of special imaging studies such as CT scan, ultrasound, MRI, fluoroscopy, and nuclear medicine

Skills

1. At the end of the course the student should able to:
2. Recognise normal structures on imaging
3. Recognise pathologic structures on imaging
4. Interpret basic imaging studies
5. Interpret images of the following: chest and CVS; musculoskeletal; abdomen; neuroradiology: limbs; head and neck; pelvis and ophthalmic
6. Able to request the appropriate imaging investigations
7. To interpret major findings on radiographs and images from other imaging modalities
8. Able to prepare patients for radiological studies: contrast reactions, MRI safety, and radiation exposure
9. Read ultrasound images

Attitudinal Objectives
At the end of the course the student should able to:

1. Understanding the role radiologic investigations plays in patient care
2. Effective communication with patients, their families, peers, colleagues, other healthcare professionals in the radiologic investigations
3. Exhibit ethical and professionals traits
4. Respect and autonomy of the patient

Course content

1. Fundamental principles

Anatomy and function: normal structures on imaging, pathologic imaging

1. Normal processes of imaging
2. Principles of radiologic diagnosis
3. Radiological features of common diseases in South Sudan
4. Imaging methods for diagnosis in South Sudan

Patient safety: Principles of radiation protection

Risks: magnetic resonance imaging, contrast media, interventional procedures

Imaging investigations: Indications, preparation, how frequent studies are conducted, effects on patients, follow-up care

Patient experience: what is involved in imaging investigation as understood by the patient, information to patient so as to limit anxiety, psychological issues of the patient

Informed consent: principles of informed consent, information given to patient, nature of accurate informed consent, decision making involving patient, good communication

Multidisciplinary involvement: roles of different health professionals involved, patient referral if needed, good communication, accurate referral information

2. Common emergencies

Chest radiograph (CXR)
Misplaced nasogastric tube, central venous line
Lungs: consolidation, lobar collapse,
Pleural effusion
Heart failure
Foreign body
Pneumothorax
Abdominal radiograph (AXR)
Small and large bowel obstruction
Toxic megacolon
Pneumoperitoneum
Abnormal calcifications
Skeletal radiograph
Bone fractures
Pelvis
Femoral neck
Wrist/carpus/scaphoid
Long bones

Fractures involving joint/epiphyseal plate

Joint dislocation
Joint Effusion
Lipohaemarthritis
Fracture dislocation of spine

Major trauma, computed tomography (CT)

Head injury
Bone and soft tissue trauma
Spinal injury
Thoracic injury
Abdomino-pelvic trauma
Acute vascular injury

Imaging for common clinical presentations

Chest and cardiovascular
Chest pain
Thoracic trauma
Breathlessness
Cough

Haemoptysis
Gastrointestinal
Abdominal pain
Abdominal masses
Abdominal trauma
Swallowing disorders
Bowel obstruction
Bowel perforation
Change in bowel habit
Jaundice
Investigating gastrointestinal haemorrhage
Renal and urology
Urinary colic
Haematuria
Acute kidney injury
Urinary obstruction
Acute presentation of testicular disease
Breast
Masses
Abscess
Trauma

Nuerological conditions

Head injury
Stroke
Severe headache
Seizures
Altered consciousness
Spinal cord compression
Musculoskeletal
Bone pain
Joint pain
Bone and soft tissue infection
Spinal injury
Neck and back pain

Obstetric and Gynaecological

- Suspected or abnormal pregnancy
- Abnormal vaginal bleeding, pelvic pain
- Pelvic mass
- Ultrasound in normal pregnancy
- Multisystem
- Oncological disease staging
- Anaemia
- Pyrexia of unknown origin
- Childhood
- Trauma
- Non-accidental injury
- The limping child
- Painful limb
- Principles of imaging specific to children
- Urinary tract infections

Teaching Methods and Teaching Hours

Lectures- 10 hours/week
Attendances at special units/clinics- 15 hours/week

Seminars 1 hour/week
Study-guides and other student-centred learning approaches
Clinical Rotations/ Bedside teaching
Tutorials
Self-directed learning
Web/ICT learning

Assessment Methods

Continuous assessment- **40%**

Student profiles
Log book- 15%
Clinical examination- 15%
Written examination- 10%
OSCE-

Final examinations - **60%**

Written paper - 25%
OSCE - 30%
Final Oral - 5%

Computer- based clinical examination (short-answer slide show)
SBA
EMQ

Recommended Text Books

1.Spratt JD, Salkowski L, Loukas M, Turmeqei T,Wetr J, Abrams P, (2016). Weirs and Abrams' Imaging Atlas of Human Anatomy, Elsevier. ISBN-13; 978-078-0723438267; ISBN-10:9780723438267
2. Patel P, (2010). Lecture Notes in Radiology (3rd Edition). Wile- Blackwell.ISBN-13-13:978-1405140; ISBN-10: 1405195142
3. Rockkall A, Hatrick A, Amstrong P, Wastir M (2013).ISBN-10: 0470658908
4. Quellette H, Tetreault P. Learning Radiology, made ridiculously easy.
5. Daffner RH, Hartman MS, Clinical Radiology 4th Edition

Journals and Websites to be provided by the lecturers

(10) Course title: Dermatology and Venereology

Credit hours: 3
Contact hours: 15
Practical/Clinical Round: 90

Contact Hours: Lectures - 4 hours per week for weeks
Attendance at special units/clinics - 15 hours per week
Seminars - 2 hours per week
Attendance and participation at outpatient clinic- 8 hours per week
Study guides and other student-centred learning methods

Course aim

To provide an integrated undergraduate course in clinical dermatology and sexually transmitted infections and consolidate the clinical skills for eliciting signs and symptoms.

Learning Outcomes/Course objectives:

On completion of the course the student should be able to:

Knowledge

At the end of the course the student should able to:

1. Have knowledge of the basic approach to diagnosis and management of the common skin diseases and STIs encountered in general medical practice
2. Have knowledge of the principles and practice of topical and systemic therapeutics

3. Knowledge of major life-threatening skin diseases and skin markers of systemic disease
4. Understand the principles of the skin immune system.
5. Good knowledge of common skin diseases, clinical manifestations and bedside investigations
6. Have knowledge of the mode of action of commonly used dermatological drugs including their indications, dose, toxicity, metabolism and drug interactions.

Skills

1. Confidence and experience in history taking and general physical examination with special attention to examination and description of the skin and genital conditions
2. Develop capacity to write concisely and presenting orally as clear as possible, communication skills
3. Perform special diagnostic procedures (KOH, Tzanck test, patch test, skin biopsy) to assist in delineating patient's problems
4. Able to diagnose and treat common skin conditions
5. Intepret evidence, formulate simple management plans
6. Recognise the significance of the less common but important skin problems and dermatological emergencies
7. Have perform skills utilized in dermatology
8. Appreciate the psychosocial impact of skin diseases
9. History taking and examination of a patient with a dermatologic condition

Attitudes:

1. Participate in caring for patients as an opportunity to observe the natural course of the disease and following up patients after instituting treatment
2. Recognise and develop an appreciation of the psychosocial impact of the disease on the patient and manage the patient accordingly.
3. Develop an appreciate the psychosocial effects on patients with STI
4. Appreciate the relationship between skin diseases and other medical and surgical conditions and the psychosocial impact on the patient
5. Critically read the current literature regarding the specific conditions affecting one's patient. This will inculcate the student with the desire for lifelong learning
6. Have adequate knowledge of various dermatological therapies with special emphasis on mode of topical therapy
7. Communicate effectively with patients and colleagues

Course Content:

A. Dermatology

Pathophysiology of signs and symptoms of skin and genital disorders
Clinical features of common skin and genital disorders
Management of common skin and genital disorders
1. History taking:
i) presenting complaint/s, duration of conditions, history of presenting complaint/s , relevant past history (personal, family); relevant occupational exposure associated with the presenting complaint/s/disease; treatment history (topical/systemic: duration of use, method of use); other substances applied (soap, cosmetics) home remedies: history of drug taking (prescription drugs, self-medication).
ii) Sexual history: marital status (single, married, widowed, multiple, heterosexual, gay, sex (protected unprotected, nature of contact
iii) Personal history of: atopic diathesis, change of climate, dietary history, history of substance abuse/use, addictions)
iv) Systemic complaints: respiratory- TB/sarcoidosis, SS); cardiovascular- SS/ lentiginosis; gastrointestinal: DH, HS, purpura: Neurological-leprosy: constructional symptoms
v) Obstetrics and Gynaecologic history
vi) Family history
2. Examination:
i) hair (colour change, texture, density, distribution of terminal hair, scaling/crusting, alopecia, scarring/ non-scarring
ii) nails: proximal/lateral nail folds, nail plate-surface/colour, nail bed
iii) mucosa: oral, ocular, nasal, anal, genital

iv) relevant physical examination
3. General physical examination: pallor, icterus, cyanosis, lymphadenopathy, facies
4. Structure of skin and its appendages: skin as an organ system, embryology, histology
5. Functions of the skin
6. Signs and symptoms in dermatology:
i) Symptoms: pruritis, burning sensation, pain, paraesthesia, hypo/anaesthesia; ii) signs: Auspitz, Darier's, Nikolskys's. Koebner's phenomenon.
Signs and symptoms (onset, duration, site, diurnal variation, aggravating and relieving factors)
7. Laboratory methods: staining: potassium hydroxide, Gram's stain, and Giesma stain (to demonstrate acantholytic cells, giant cells, molluscum contagiosum, LD bodies / Donovan bodies, AFB-ZN staining, dark ground microscopy
8. Causes of skin diseases
9. Impact of skin diseases
10. Common pathological terms in dermatology
11. Common skin infections:
    i) Viral diseases:
        Human papilloma virus (warts)
        Herpes viruses (herpes simplex, herpes zoster)
        Pox virus (molluscum contagiosum)
    ii) Bacterial conditions
        Impetigo
        Cellulitis
        Mycobacterium infections (Hansen's disease, leprosy)
    iii) Fungal infections
        Dermatophytosis
        Pityriasis versicolour (Tinea versicolour)
        Candidiasis
    iv) Infestations
        Cutaneous larva migrans
12. Papulosquamous disorders
        Eczema
        Psoriasis
        Lichen plans
        Pityriasis rosea
        Erythroderma (exfoliative dermatitis)
13. Disorders of pigmentation
        Determinants of normal skin colour
        Vitiligo
        Melisma
14. Blistering diseases (bullous diseases)
        Pemphigus vulgaris
        Bullous pemphigoid
        Dermatitis hepertiformis
15. Disorders of skin appendages
        Disorders of sebaceous glands: acne vulgaris, rosacea
        Disorders of sweat glands
        Disorders of nails
        Disorders of hair: alopecia (hair loss), excessive hair growth
16. Skin tumours
        Basal cell carcinoma (rodent ulcer)
        Squamous cell carcinoma
        Melanoma
17. Topical/systemic drugs in dermatology
        Principles of topical therapy
        Factors affecting percutaneous absorption

Classification of topical preparations
Ideal vehicle
Use of different preparations

Topical preparations: emollients, shampoos, soaps and soap substitutes, antiseptics, antifungals, antibiotics, antivirals, steroids, steroid-antibiotic combinations, retinoids steroid-antifungal combinations, tar, local anaesthetics and others

Systemic drugs: indications, side effects.

18. Emergencies in Dermatology.

Recognition, salient features and management,
EM, SJS, TEN, erythroderma, adverse drug eruptions, acute urticarial, angioedema, anaphylaxis, Staphylococcal scalded skin syndrome, acute generalized pustular psoriasis, acute skin loss.

B. Sexually transmitted infections

Presentations of STIs: urethral discharge, vaginal discharge, genital ulcers, complications
Syndromic treatment
Control of STIs
Common STIs: syphilis, gonorrhea, genital chlamydia infections, chancroid, lympogranuloma Venereum, granuloma inguinale (Donavanosis), HIV/AIDS

C. Andrology

Definition, anatomy and physiology of the male reproductive system
Assessment of infertile male
Aetiology of male infertility
Male erectile dysfunction (impotence)
Male disorders of ejaculation
Sexual deviations
Sex addiction

Teaching Methods and Teaching Hours

Lectures -	4 hours per week for weeks???
Attendance at special units/clinics -	15 hours per week
Seminars -	2 hours per week
Attendance and participation at outpatient clinic-	8 hours per week
Study guides and other student-centred learning methods	

Assessment Methods:

Continuous assessment (student profiles, log books, clinical examinations) - 40%
Final written examination - 60%
Written papers -
Clinical exams/OSCE-
Long and short cases-

Assessment criteria: Knowledge of applied basic and clinical sciences, clinical competence, and professionalism and ethics. Failure in clinical competence means that the student fails that course. Assessment methods must reflect the learning objectives/learning outcomes.

To contribute 20% of the Internal Medicine Final Examination mark

Recommended Text Books

1. Swash, M. and Glynn M. (Eds) (2007). Hutchinson's Clinical Methods: An integrated Approach to clinical practice (22nd Edition). Edinburgh, London. Saunders Elsevier. ISBN978 0 7020 27987.
2. Macleod J(Ed). Davidson's Principles and Practice of Medicine: a Text book for students and doctors. (14th Ed). Churchill Livingstone. Edinburgh, 1984.
3. Hunter JC, Savin J, Dahl M, Weller RB. Clinical Dermatology. 4th Edition.
4. Gawkrodgers D. Dermatology, an illustrated colour text
5. Marks R. Roxburg Textbook of Dermatology

(11) Course title: PSYCHIATRY AND MENTAL HEALTH

Credit hours: 8

Contact hours: 45

Practical/Clinical Rounds: 135

Introduction

The Psychiatry and Mental Health Core Clerkship covers the competences of knowledge, skills, and attitudes. Psychiatric and mental health issues commonly occur among patients in all disciplines of medicine. This course gives the student an opportunity to appreciate and approach psychiatry and mental health in a holistic manner.

Course aim:

1. Develop students to appreciate appropriate knowledge, skills and attitudes to psychiatric and mental health issues.
2. To acquire knowledge: psychiatric symptoms and syndromes, psychological aspects of medical disorders and psychosocial problems.
3. Acquire communication skills to be able to communicate professionally with people of all ages and diverse cultures and socioeconomic background.
4. To apply knowledge of basic sciences in clinical psychiatry and mental health
5. Demonstrate the skills of accessing scientific literature so as to keep abreast with new developments in the discipline for the benefit of the patients under their care.
6. Recognise and appropriately address the ethical issues arising in clinical practice
7. To develop professional doctor-patient relationship and manage a patient based on an integrated biological, social and psychosocial approaches.

Learning Objectives/Course Objectives

Knowledge Objectives

At the end of the course, the student will be able to:

1. Demonstrate proficiency in the recognition, evaluation, and management of persons with varied psychiatric disorders and mental health problems;
2. Describe the diverse presentations of persons with psychiatric and mental health problems along their related complications
3. Recognise the importance of reviewing the outcomes and principles of prevention, promotion, education and treatment of psychiatric disorders and mental health problems
4. Integrate technology, scientific base and humanistic approach in managing patients
5. Describe the role played by the neurobiological, genetic and environmental theories of aetiology of psychiatric disorders and mental health problems.

Attitudinal Objectives:

At the end of the course, the student will be able to:

1. Recognise the importance of good professional doctor-patient relationships
2. Demonstrate respect, empathy, responsiveness, and concern for the patient's presenting problems along with their personal characteristics;
3. Appreciate the role of the stage of development of the patient in the life cycle and longitudinal perspective of the patient's illness
4. Recognise and respect the important role family and the wider environment of the patient, culture, religion, social circumstances play in the health and illness of the patient
5. Demonstrate sensitivity and respect when dealing with persons of similar or different gender, ethnicity, sexual orientation, socio-economic status, education, political views, and personality traits.
6. Teachers must thus role model these attitudes for the students
7. Respect patients and their families, peers and other members of the healthcare team
8. Prioritises the patient's welfare
9. Accepts full responsibilities for shortcomings she or he commits in the management of a patient and readily consults experienced senior colleagues.
10. Committed to lifelong learning by actively participating in continuing professional development
11. Promoting team working spirit
12. Demonstrate effective communication skills, caring, respective, ethical, professional, and compassionate behaviour when interacting with patients and their families.
13. Demonstrate a commitment to ethical principles with regards to providing or withholding clinical care,

confidentiality of patient information, informed consent, and business practices.

14. Demonstrate sensitivity and responsiveness to patient's culture, age, gender, religion and disabilities
15. To practise interprofessional collaboration in delivering care to patients.
16. Develop lifelong learning skills by attending continuing education sessions and engage in self- directed study.
17. Exhibit good professional communication skills with the patients and their families, colleagues and other members of the healthcare team: verbal, written or by any other means
18. Educate and counsel the patient and family on the findings and what needs to be done.

Skills Objectives

At the end of the course, the student will be able to:

1. To take a psychiatric history from the patient and from other source
2. Take a drug and alcohol history
3. Examine the mental state of the patient which skill would be used on other patients
4. Good communication with the patient
5. Able to institute treatment in a difficult patient
6. Share information regarding the presenting complaint, diagnosis, management and prognosis to the patient and family.
7. Impart information about medication and ensure compliance;
8. Conduct an interview to facilitate information-gathering and develop a therapeutic relationship.

Information Evaluation Skills

1. Selection of crucial information to formulate differential diagnoses
2. Evaluation of the role of the patient's social factors and his personality on the presenting complaint
3. Formulation of a treatment plan or referral for specialist attention

Treatment Skills

1. Encourage adherence to treatment and elicit barriers and minimise them
2. Prescribe appropriate medication and recognise adverse drug reactions which should be distinguished from the patient's illness

Learning Skills

1. Sustain self-directed lifelong learning for purposes of keeping up to date with advances in psychiatry during one's professional life

Teamwork Skills

1. Cooperating with colleagues and other healthcare professionals
2. Recognise family, organisations in the community that offer support services and promote mental health

Pre-requisites

Neuroscience and behavioural sciences.
Clinical Medicine
Health Care Ethics

Course Content:

1. Introduction to Psychiatry
2. Definition of psychiatry, its scope and specialty
3. Historical development in psychiatry
4. Current classification of psychiatric disorder (DSMRV, ICD 10)

Aetiology of Mental Disorders

1. Socio-cultural theories
2. Genetic theories
3. Environmental theories
4. Biochemical theories
5. Psychopathology
6. Disorders of thought, memory, speech, perception, cognition, motor affect speech.

General Adult Psychiatry and Mental Problems

1. Anxiety Disorders
2. Mood Disorders
3. Psychotic Disorders
4. Somatoform Disorders
5. Personality Disorders
6. Emergency Disorders
7. Sexual Disorders
8. Sleep Disorders
9. Alcohol and Substance use Disorders
10. Disorders associated with Pregnancy
11. Old age Disorders

Psychiatric Disorders in Childhood and Adolescence

1. Encopresis and enuresis
2. Mental retardation
3. Autism spectrum disorders
4. Attention deficit Disorders
5. Conduct Disorder
6. Alcohol and Substance abuse in adolescence
7. Child abuse
8. Principles of child and adolescence psychopharmacology

Neuropsychiatric Disorders

1. Definition and Scope of Neuropsychiatric Disorders
2. Delirium
3. Dementia
4. Informed consent and patients' rights
5. HIV & AIDS associated Dementia
6. Principles of treatment of Neuropsychiatry Disorders

Diseases of the Brain

1. Epilepsy
2. Head Injury
3. Stroke

Ethical and Legal Issues: Confidentiality, competency, informed consent, autonomy and beneficence

1. Legal requirements for admission and/or treatment
2. Issues related to the participation of patients in research
3. The conflict between benefits and social justice
4. Risk/ Competence assessment
5. Criminal responsibility
6. Mental health law, basic knowledge of the Mental Health Act
7. Risk assessment: danger to self and others
8. Pharmacology: treatment of major and minor mental disorders and side effects of treatment.

Teaching Methods

Lectures
Ward rounds: bedside teaching
Tutorials
Seminars
Web/ICT learning resources
Clinical rotations
Case presentations/ small group discussions

Contact Hours

Lectures –	1Hour/ week
Ward Round-	25 Hours/ week
Tutorial –	3 Hours/ week

Case presentations/ small group discussions- 5 hours/ week

Assessment Method

Continuous Assessment -	**40%**
Written -	20%
OSCE-	20%
Final Examination -	**60%**
Written papers-	25%
OSCE-	30%
Oral exam-	5%

Recommended Textbooks

1. Glynn M and Drake W. (Eds) (2017). Hutchinson's Clinical Methods: An integrated approach to clinical practice (24th Edition).
2. Elsevier. ISBN-13:978-0702067396, ISBN-10:0702067393.
3. Bickley L. (2008). Bate's Guide to Psychiatry Examination and History Taking (12th Edition) Lippincott Williams and Wilkins.ISBN-13:978-1469893419, ISBN-10:978-1469893419.
4. Saddock B, Saddock V, Ruiz R (2017). Kaplan and Shaddock's Comprehensive Textbook of Psychiatry (2 Volume Set), Lippincott Williams and Wilkins, ISBN-13: 978-1451100471, ISBN-10:1451100477.
5. Gelder M, Andreasen N, Lope-Ibor J, Geddes J. (2012). New Oxford Textbook of Psychiatry. Oxford University Press.ISBN-13:978-0199696758, ISBN-10:0199696756.
6. Journals and Websites to be advised by the lecturer/course coordinator

(12) Course title: Molecular Medicine

Credit hours: 3
Contact hours: 15
Practicals/Clinicals: 90

14.5. MAJOR CLINICAL SUBJECTS: SEMESTERS VI, VII, VIII, IX, XI, SXII

(1) Course title: Internal Medicine

Credit hours: 39
Contact hours: 135
Practical/Clinical Round: 2,070
Semesters for the courses to be taught:
VI, VII, VIII (Credit hours: 8, Contact hours: 30, Clinical Rounds: 270),
IX (Credit hours: 19, Contact hours: 45, Clinical Rounds: 720),
XI (Credit hours: 12, Contact hours: 60, Clinical Rounds: 360),
XII (Credit hours: 16, Clinical Rounds: 720)

Professional Development

Introduction.

Professional development is an important aspect in a professional career. The student should therefore start early in their profession to engage and have knowledge of activities that would help them grow in their careers. Lifelong learning is a key factor.

Course Aim:

Students to know concepts and analytical methods used in health management, essential skills and ethical practice in health care delivery and health research.

Learning Outcomes/Course objectives

At the end of the course, the student should be able to:

1. Appreciate, differentiate and apply ethical theories in healthcare and research.
2. Apply relevant codes of ethics in health care and research.
3. Apply basic epidemiologic concepts (such as incidence, prevalence, relative risk etc) during healthcare delivery.
4. Apply appropriate biostatistics methods in data collection and presentation.
5. Develop a sound research proposal.
6. Conduct research that respects research ethics and legal regulatory frameworks.
7. Apply evidence-based management theories and tools in the healthcare practice.
8. Describe and be able to apply the Health Information Management System in the country.
9. Demonstrate understand different leadership styles, change management concepts and performance appraisals.
10. Communicate effectively with colleagues, patients and the community.
11. Take a comprehensive medical history.
12. Perform a thorough general clinical examination and targeted clinical examination.
13. Perform common clinical procedures on manikins, models and simulated patients carefully
14. Evaluate clinical situations so as to institute appropriate practice as guided by the principles and codes of ethics

Course Competencies

1. Appreciating and applying different ethical theories in healthcare
2. Applying basic codes of ethics in every healthcare setting
3. Formulate and apply relevant ethical positions, guided by the recognized ethical codes in various clinical and research situations

1. Recognizing and responding appropriately to the unprofessional behavior of others.
2. Applying basic epidemiologic concepts (incidence, prevalence, relative risk) and measures of disease occurrence in the community.
3. Applying and interpret biostatistics principles in data management during research activities.
4. Demonstrating high professional skills in conducting research.
5. Preparing a sound ethical research proposal
6. Conducting and publishing a research compliant with ethical principles and legal regulatory conduct.
7. Applying knowledge in bio-statistical data collection, analysis and interpretation.
8. Describing basic concepts used in statistical analysis.
9. Applying management theories and tools in the health sector.
10. Describing and to use the Health Information Management System in the country.
11. Demonstrating an understanding of different leadership styles, change management concepts and performance appraisals.
12. Demonstrating knowledge on health planning and management of l health service delivery systems.
13. Describing organizational management and associated theories.

14. Managing financial and material resources efficiently
15. Communicating effectively using appropriate medical terms and expressions applicable to the health sector.
16. Obtaining a comprehensive medical history.
17. Performing a general clinical and targeted clinical examination.
18. Performing common clinical procedures in the skills laboratory.

Ethics in Health Care

1. Various philosophical theories: such as Utilitarianism, Kantianism, Egoism, and Deontology)
2. Values: beneficence, maleficence, justice, autonomy, dignity, truthfulness, honesty, human rights ethics
3. Ethical Codes: Hippocratic Oath, World Medical Association Code of Ethics, Commonwealth Medical Association Code of Ethics, Declaration of Geneva of the World Medical Association, Medical Council of South Sudan.
4. Fundamental Health Care Ethics: doctor-patient relationship, respect for autonomy, patient's right to information, voluntary informed consent, confidentiality, conflict of interest.
5. Common ethical dilemmas issues: abortion, AIDS, assisted procreation, child abuse, dealing with minors, blood transfusion, post-mortem, euthanasia, genetic manipulation, experimentation on humans, tissue and organ transplants, priorities in health care, priorities on who to offer service, right to life, torture, emergency treatment, infamous conduct, fitness to practice, relationships with colleagues, improper professional behavior.
6. Research Ethics: the Role of Research Ethics Committees/Institutional Review Boards – IRBs, Declaration of Helsinki, Belmont Report, Nuremburg Informed consent, Conflict of interest, Benefit of the subjects, Risks disclosure, Academic fraud & plagiarism).

Medicine Fundamentals:

Medicine Fundamentals: Medical Terminology
- Medical Terminology:
  - Introduction
  - Basics
  - Medical prefixes and suffixes
  - Word roots for organs
  - Combining Vowels
- Medical Terminology: Prefixes
  - Prefix use
  - Location or position prefixes
  - Size prefixes
  - Amount prefixes
  - Colour prefixes
  - Negative prefixes
  - Others
- Medical Terminology: Suffixes
  - Suffix use
  - Conditions/Disease suffixes
  - Adjective suffixes
  - Signs and symptoms suffixes
  - Surgical suffixes
  - Medical profession and specialist suffixes
- Medical Terminology: Putting it all together
  - Word Analysis
  - Singular to Plural Forms
  - Eponymous Terms
  - Directional Terms and Body Planes
  - Drug Administration
  - Drug Classes

Recommended Text books

Medical Terminology

1. Collins, Edward, C., Ann DePetris. (2010)A Short Course in Medical Terminology. London: Lippincott William &Wilkins.
2. Chabner, Davi-Ellen. (2005) Medical Terminology: A Short Course. 6th Edition. London: Sanders.
Davies, Juanita, J., (2007) Essentials of Medical Terminology. 22nd Edition. Delmar: Cenngage Learning.

Medicine fundamentals: Clinical Methods

1. History Taking and Communication Skills
2. The patient interview
3. Systems review
4. Verbal and non-verbal communication

Physical Examination Skills

1. General examination
2. Cranial nerves
3. Ear, Nose, Throat and Eyes
4. Upper limb
5. Lower limb
6. Cardiovascular
7. Respiratory
8. Abdomen
9. Neurological including cranial nerves
10. Mental status examination
11. Pelvic examination**Skills Training**

1. Lumbar puncture
2. Venepuncture and cannulation
3. Umbilical vein/artery cannulation
4. Bladder cauterization
5. Suturing
6. Thoracentesis: diagnostic peritoneo-centesis, colposcopy and aspiration Pelvic Inspection
7. Nasogastric intubation and gastric lavage recto- sigmoid intubation and deflation
8. Simple microscopy e.g. for Malaria
9 Urinalysis
10. Examination of stool

Recommended Text books

Clinical Methods

1. Swash, M. and Glynn M. (Eds.) (2007) Hutchinson's Clinical Methods: An integrated approach to clinical practice.22nd Edition. London:
2. Saunders ElsevierJarvis, C. (2004) Physical Examination & Health Assessment.4th Ed. Missouri: Saunders-Elsevier.
3. Bickley, L (2008) Bates' Guide to Physical Examination and History Taking.10th Ed. Philadelphia: Lippincott Williams & Wilkins.
4. Coulehan, J. and Block, M (2005) The Medical Interview: Mastering Skills for Clinical Practice.5th Ed. Philadelphia: F.A. Davis Company.
5. Dehn, R. and Asprey, D. (2006) Essential Clinical Procedures. Edinburgh: Saunders.

COURSE TITLE: UROLOGY CLERKSHIP

Introduction:

The goal of the course is to introduce medical students to the diagnostic principles and management of the genitourinary tract diseases. The course wishes to impart the students with knowledge and skills to manage the diseases in the first instance before referral to a specialist urologist for the definitive and final care.

Pre-requisites: Knowledge and skills gained in the 4th year courses, applied basic sciences. Normal anatomy and physiology of the genitourinary system

Course Aims:

1. To expose the students to learn about the common aspects of urology through hands on exposure during their urology attachment: outpatient, inpatient, operating rooms.
2. To acquire competence in the diagnosis, and management of common urological conditions at the intern level and ready to further build up their competences during the internship year.
3. To achieve competence in recognising these conditions for referring complex cases to an urologist.

Course Objectives /Learning Outcomes

Knowledge:

At the end of the course the student should be able to:

1. Explain the basic sciences' (anatomy, physiology, biochemistry, pathology) roles in the signs and symptoms of disease in relation to the disease severity.
2. Explain the rationale for bedside laboratory investigations in formulating a diagnosis and the ongoing monitoring of the disease process.
3. Interpretation of laboratory results and other investigations to aid diagnosis and patient management.
4. Explain the therapeutic approaches in the management of diseases
5. Identify drugs that are used to treat common diseases

Skills Objectives

At the end of the course the student should demonstrate competence in the following skills:

1. Accurately elicit and interpret signs and symptoms of diseases
2. Accurately enter in the patient's records clearly and concisely written notes
3. Formulate treatment plans for patients
4. Perform appropriate bedside therapeutic and diagnostic procedures
5. Institute basic life support
6. Exhibit good professional communication skills with the patients and their families, colleagues and other members of the healthcare team: verbal, written or by any other means
7. Take an accurate, appropriate, and full urological history.
8. Conduct an appropriate physical urological examination.
9. Use appropriate diagnostic approaches to formulate a diagnosis.
10. Develop and execute a management plan.
11. Educate and counsel the patient and family on the findings and what needs to be done.
12. Obtain information about the community from which the patient is coming from.
13. Develop the necessary skills to critically appraise the published literature before one applies the "new approach" on their patients.
14. Use information technology to access on-line medical information to support the education of the patient and the community.
15. Perform and interpret urinalysis, urine culture and sensitivity tests, post–void residual urine residual urine measurement, gram stain, wet prep, and sperm analysis.

Attitudinal objectives:

At the end of the course the student should be able to demonstrate the following attitudes:

1. Respect patients and their families, peers and other members of the healthcare team
2. Prioritises the patient's welfare
3. Accepts full responsibilities for shortcomings she or he commits in the management of a patient and readily consults experienced senior colleagues.
4. Committed to lifelong learning by actively participating in continuing professional development
5. Promoting team working spirit
6. Demonstrate effective communication skills, caring, respective, ethical, professional, and compassionate behavior when interacting with patients and their families.
7. Demonstrate a commitment to ethical principles with regards to providing or withholding clinical care, confidentiality of patient information, informed consent, and business practices.
8. Demonstrate sensitivity and responsiveness to patient's culture, age, gender, religion and disabilities

9. To practise interprofessional collaboration in delivering care to patients.
10. Develop lifelong learning skills by attending continuing education sessions and engage in self- directed study.
11. Perform bladder catherisation of adult women and men.
12. Perform a suprapubic tap on an infant.
13. Evaluate renal function tests. Carry out the necessary investigations to aid the formulating the diagnosis.
14. When possible information technology should be used to aid in diagnosis and patient education.
15. Make evidence-based decision based on up to date information in the medical literature

Course Content:

Lower urinary tract

1. Adult and children acute and chronic cystitis
2. Differential diagnosis and treatment of urethritis
3. Scrotal masses: hydrocele, spermatocele
4. Torsion of testes
5. Epididymitis
6. Use and misuse of urinary catheters
7. Circumcision
8. Vasectomy
9. Prostatitis and BPH
10. Prostatic cancer: Differential diagnosis, treatment, indications for PSA.
11. Other cancers: penis, testes, bladder
12. Undescended testes, phimosis and paraphimosis; hypospadias; balanitis; varicocele of testes
13. Scrotal trauma

Upper urinary tract

1. Pyelonephrosis
2. Renal and ureteral colic, workup for renal stones and management
3. Renal neoplasms
4. Flank pain

Others

1. Impotence
2. Incontinence
3. Infertility
4. Urinalysis: semen analysis
5. Imaging: IVP, VCUG, Renal scan, CT
6. Pediatric and adult differential diagnosis of haematuria
7. Nocturnal enuresis
8. Urological problems of paraplegics
9. Differential and treatment of vesiculourecteral reflux.
10. U-V reflex
11. Acute urinary obstruction
12. Venereal disease
13. Common cancers

Teaching Methods:

Clinical rotations
Bedside teaching
Tutorials
Seminars
Lectures
Web/ICT based learning and teaching

Assessment Methods

Rationale:

A student who fails the clinical competence assessment of the course shall be deemed to have failed the course. The assessment methods used will reflect the learning objectives of the course.

Continuous Assessment-	**40%**
Final Examination (written and clinical) -	**60%**

Recommended Text Books

1. Merseburger A, Kucyk M, Moul J. (2014). Urology at a Glance (2014 Edition). Springer. ISBN-13: 978-3642548581, ISBN-10:364254858X.
2. Reynard J, Brewster S, Biers S (2013). Oxford Handbook of Urology (Oxford Medical Handbooks) (3rd Edition). Oxford University Press, ISBN-13:978-0199696130.ISBN-10: 9780199696130.
3. Dunnick NR, Newhouse JH, Cohan RH, Maturen KE. (2017). Genitourinary Radiology (6th Edition). LWW.ISBN-13:978-1496356192.ISBN-10:9781496356192.

Journals and Websites to be provided by the lecturer.

COURSE TITLE: FOUNDATIONS IN CLINICAL MEDICINE:

Introduction

This course offers students the opportunity to learn basic principles required for the practice of medicine through interactive large and small group seminars, direct patient interaction, and one-on-one mentorship by practising clinicians, and standardized patient/ simulation training sessions. Topics covered in this course include medical interviewing, the screening physical examination, doctor-patient relationship, clinical reasoning, humanism and professionalism, and health promotion/ disease prevention.

Course Aim

To introduce students to essential aspects of effective and compassionate care of patients in a professional and ethical manner.

Learning Objectives/ Course Objectives

By the end of this course the student should be able to:

1. Take a comprehensive history of a patient
2. Conduct a systematic approach to examining a patient
3. Demonstrate holistic attributes and appropriate linguistic skills
4. Examine a patient system by system
5. Record one's findings and communicate them to colleagues.
6. Demonstrate skills in investigating and observing in the skills lab and on standardised patients.

Course Content

History taking and communication skills

1. The patient interview
2. Systems review
3. Verbal and non-verbal communication

Physical Examination Skills

1. General examination
2. Cranial nerves
3. Ear, Nose, Throat and Eyes
4. Upper limb
5. Lower limb
6. Cardiovascular
7. Respiratory
8. Abdomen
9. Neurological including cranial nerves
10. Mental status examination
11. Pelvic examination

Skills Training

1. Lumbar puncture
2. Venipuncture and cannulation
3. Pelvic examination
4. Catherisation
5. Suturing
6. Paracentesis / thoracentesis / pericardiocentesis
7. Nasogastric intubation

8. Ultrasound.
9. Urinalysis
10. Examination of stool

Teaching/Training Methods

Small-group learning
Demonstrations and/or practice opportunities
Cross-cultural, standardized patient (SP) interview
Interactive lectures,
Skill-building small group sessions,
Clinical reasoning exercises,
Role-play, and
Directly supervised patient interaction

Assessment Methods:

Continuous assessment -	**40%**
Continuous assessment tests/reflective portfolio -	35%
Laboratory/practical reports/OSCE -	5%
Final written examination -	**60%**
Paper 1 - Essays and short notes-	30%
Paper 2 -Multiple choice questions- OSCE	30%

Recommended Text Books

1. Swash, M. and Glynn M. (Eds) (2007). Hutchinson's clinical methods: an integrated approach to clinical practice (22nd Edition). Edinburgh, London. Saunders Elsevier. ISBN 978 0 7020 27987.
2. Macleod J (ed). Davidson's Principles and Practice of Medicine: a text book for students and doctors. (14th Ed). Churchill Livingstone. Edinburgh, 1984.
3. Bickley, L (2008). Bates' Guide to Physical Examination and History Taking (10th Ed). Lippincott Williams & Wilkins. ISBN-10: 0781780586.
4. Kumar P, Clark M. Clinical Medicine (13th Ed). Bailliere Tindall; London 1994.
5. Cook G. Mansons Tropical Medicine (20th Ed). WB Saunders Company Ltd; London, 1996.
6. Macleod J. Clinical Examination (6th Ed.) Churchill Livingstone. Edinburgh, 198.
7. Toghill PJ. Examining Patients. An introduction to clinical medicine. Edward Arnold. London 1990.

COURSE TITLE: <u>INTERNAL MEDICINE JUNIOR CLERKSHIP</u>

Introduction

This course introduces the clinical skills for obtaining relevant history and eliciting physical signs. The student is expected to acquire the attitudes required to practice Clinical Medicine through observation and practice. The student is also introduced to bedside practical procedures and investigations in Internal Medicine.

Course Aim

To introduce the principles of practice in Internal Medicine

Learning Outcomes/ Course Objectives

Knowledge objectives:

At the end of the course the student should be able to:

1. Take a sensitive and thorough medical history
2. Recognise symptoms and signs of common disease conditions
3. Recognise symptoms and signs of common medical emergencies
4. Explain the physiological, anatomical and pathological basis for symptoms and signs of diseases
5. Analyse and synthesise symptoms and signs to identify the underlying disease processes

6. Acquire knowledge about disorders of different systems
7. Identify laboratory or bedside investigations required to evaluate various disease states to make a diagnosis or monitor clinical progress
8. Interpret results of laboratory and clinical investigations in order to make a diagnosis and assist the clinical management of patients.

Skills Objectives:

At the end of the course, the student should demonstrate competence in the following skills:

1. Obtain a clinically useful medical history from patients
2. Elicit physical signs using correct techniques
3. Perform basic bed side procedures
4. To perform a complete history and physical examination of a patient with a febrile illness
5. Demonstrate understanding of immunisations
6. Demonstrate ability to examine the skin: preparation, describe skin lesions, inspection (shape, colour, shape, size, border, excoriation, ulcer/erosion, weeping,, crusting, hyperkeratosis, blood vessels,, odour
7. Able to carry out a skin snip
8. Demonstrate ability to carry out a blood film and stain it
9. Understand appropriate antibiotic use in different situations:
   i) community acquired infections, pneumonia, ii) nosocomial pneumonia ii) bacterial endocarditis iii) sepsis iv) diabetic soft tissue infections iv) urinary tract infections
10. Interpersonal skills and communication: effective communication with patients, families, colleagues and other healthcare professionals
11. Present information concisely and clearly
12. Professionalism

Attitudinal Objectives:

At the end of the course, the student should demonstrate the following attitudes:

1. Respect of the patient's privacy, religious, cultural or other beliefs
2. Engage in interprofessional collaborative practice to improve patient outcomes
3. Confidentiality of the information obtained from patients in the course of his/ her training
4. Awareness of his/her professional limitations
5. Commitment to life-long learning
6. Respect for other health care professionals

Course Content

Introduction to bedside medicine

1. The doctor and the other members of health care
2. Doctor patient relations
3. History taking and physical examination
4. Laboratory investigations and invasive procedures
5. Principles of in-patient and out-patient care
6. Community-based versus hospital-based medicine

Infectious Diseases: Emphasis on common conditions in the Republic of South Sudan

1. Principles of infectious diseases: viral, bacterial, fungal, and parasitic
2. Pathophysiology of symptoms and signs of infection
3. Clinical features of common infectious conditions in South Sudan
4. Approaches to the investigation of infectious diseases
5. Management and care including prevention
6. Emergent Infectious Diseases
7. Causes of fever
8. Interpretation: culture and sensitivity data on: sputum, urine, blood, wound and quantitative burn cultures. Serology studies: viral diseases (HIV, hepatitis, EBV, CMV, others), syphilis, etc; parasitic and bacterial
9. Preparation and interpretation of gram stains and AFB smears
10. Pharmacokinetics, side effects, toxicities, dosing of antibiotics

Respiratory Medicine

1. Clinical examination of the respiratory system
2. Applied anatomy and physiology
3. Investigation of respiratory diseases

Pulmonary function tests pulmonary diagnostic tests

Spirometry
Bronchial challenge test
Lung volumes and DLCO
Pulmonary testing interpretation
6 minute walk test
Pulse oximetry
Imaging and bronchoscopy

4. Principles of respiratory medicine
5. Pathophysiology of signs and symptoms of respiratory disease
6. Clinical features of common respiratory diseases in South Sudan.
   - Cough
   - Breathlessness
   - Chest pain
   - Haemoptysis
   - Incidental image findings
   - Pleural effusion
   - Respiratory failure
7. Obstructive pulmonary disease
   - Asthma
   - Chronic obstructive pulmonary disease (COPD)
   - Bronchiectasis
   - Cystic fibrosis
8. Infections of the respiratory system
   - Upper respiratory tract infections
   - Pneumonias
   - Suppurative lung disease (lung abscess, empyema, bronchiectasis
   - Chronic bronchitis and emphysema
   - Pulmonary tuberculosis
   - Pulmonary fibrosis
   - Phelumocosis
   - Fungal infections
9. Tumours of the bronchus and lungs
   - Carcinoma of the bronchus and bronchial adenoma
   - Tumours of the mediastinum
   - Secondary lung tumours
   - Primary lung tumours
   - Lung tumours in South Sudan
10. Interstitial and infiltrative pulmonary diseases
    - Diffuse parenchymal lung disease
    - Lung disease caused by organic and inorganic dust and systemic inflammatory diseases, irradiation and drugs
11. Pulmonary vascular lung diseases
    - Venous thromboembolism
    - Pulmonary hypertension
12. Diseases of the upper airway
    - Nasopharynx
    - Sleeping disorders
    - Laryngeal and tracheal disorders
13. Diseases of the pleura , diaphragm and chest wall
    - Pleura
    - Diaphragm

Chest wall

14. Pneumothorax

Cardiovascular Medicine

1. Principles of cardiac function in health and disease
2. Pathophysiology of signs and symptoms of cardiovascular system and diseases
3. Clinical features of common cardiovascular diseases
4. Approaches to the investigation of cardiovascular diseases
5. Pathophysiology of cardiac failure
6. Valvular heart diseases (RHD)
7. Hypertension
8. Ischaemic heart disease
9. Infective endocarditis
10. Common arrythymias
11. Cardiomyopathy
12. Cardiac arrest
13. Pulmonary embolism
14. Diseases of the pericardium

Clinical syndromes:

1. Urinary tract infections
2. Sinusitis/otitis: diagnosis, treatment possible complications
3. Tuberculosis: epidemiology,clinical manifestations, diagnosis, management
4. Skin, soft tissue infections, management and complications
5. Pneumonias: community acquired, nosocomial
6. Meningitis, encephalitis, other nervous system infections
7. Opportunistic infections; clinical presentation, management, prophylaxis
   Diseases
8. Surgical wound
9. Sepsis
10. Fungemia
11. Osteomyelitis
12. Infections in trauma patients
13. Fever

Emerging infectious diseases and outbreaks

HIV, AIDS, COVID-19/Ebola/Zika /Hepatitis

A. HIV and AIDS

1. Aetiology, pathophysiology
2. Clinical manifestations.
3. Epidemiology
4. HIV tests reactivity:
5. Management and care: guided by National Guidelines for HIV and AIDS
   - i) HIV diagnostic algorithm: HIV-1 and HIV-2
     Screening with an antigen-antibody test
     Testing of reactive samples using HIV-1/2 differential assay
     Confirmatory testing
     Point-of-care sampling (oral swab, finger prick blood sample)
   - ii) Serologic tests: 1^{st} -4^{th} generation
     Serological diagnostic tests: HIV antigen-antibody laboratory based
     HIV antigen-antibody point-of care tests
     HIV antibody laboratory-based tests
     HIV antibody point-of-care tests

HIV diagnostic HIV 1 /2 differential assays
HIV nucleic acid diagnostic test
HIV-1 Western Blot laboratory tests
In-home HIV testing

6. HIV testing algorithm: Initial testing
   Differential assay
   HIV Nucleic acid testing
   Interpretation of results
7. False-negative and false-positive HIV tests
8. Communicating test results

Antiretroviral Medications and Initial Therapy

a) Reverse transcription and reverse transcriptase inhibitors
b) HIV reverse transcriptase, reverse transcription, reverse transcriptase inhibitors (nucleoside reverse transcriptase inhibitors, non-nucleoside reverse transcriptase inhibitors)
c) HIV integration and integrase strand transfer inhibitors
d) HIV integrase, HIV integration, Integrase strand transfer inhibitors
e) HIV protein processing and HIV protease inhibitors (HIV protease, polyprotein processing and maturation, protease inhibitors
f) Initiation of antiretroviral therapy:
G) To reduce morbidity and mortality
g) follow National Guidelines on antiretroviral therapy
h) Factors affecting antiretroviral regimen
i) National Guidelines
k) Pre-treatment HIV RNA level
l)Pre-treatment CD4 Cell count
   Pre-treatment of HIV, drug resistance
   - Food requiremnts: abacavir-lamivudine, tenoforvir DF-emtricitabine, tenofovir alafenamide- emtricitabine can be taken with or without food.
   Rilpivirine, atazanarvir, efavirenz
   - Chronic kudney disease
   - Osteoporosis
   - Psychiatric illness
   - Demntia
   - Cardiac problems

m) Response to ARVS
n) Prevention of HIV and AIDS. National Guidelines on HIV and AIDS

HIV and Immune reconstitution inflammatory syndrome (IRIS)

1. Definitions: IRIS, signs and symptoms, Immune restoration disease, causes of IRIS, paradoxical IRIS, and unmasking IRIS
2. Signs and symptoms of IRIS
3. Pathophysiology of IRIS (paradoxical, unmasking), mortality
4. Timing of ART initiation in patients with opportunistic infections and prevention of IRIS

Opportunistic Infections

Initiation of ART during treatment of opportunistic infections
Pulmonary tuberculosis
TB meningitis, Extrapulmonary TB
Cryptococcal meningitis
CMV Retinits
Cryptosporidiosis
Microsporidiosis
Progressive multfocal leukoencephalopathy
Kaposi's sarcoma
Pneumocystis jiroveci pneumonia
Hepatitis B virus infection
Hepatitis C virus infection

Herpes simplex virus (HSV) and varicella zoster (VZV)
Candidiasis

HIV-associated malignancies

Epidemiology
Pathophysiology
Signs and symptoms, management
Non-Hodgkin's lymphoma
CNS lymphoma
Lymphoproliferative disorders
Kaposi sarcoma
Cervical cancer
Anal cancer

COVID-19 Disease

i) Aetiology: SARS-CoV-2, pathophysiology, diagnosis, , prevention efforts
Basic virology/immunology
Investigations and therapeutics
Clinical features
Managemnt: home care, hospital facilities, ICU care
Acute, long term
Vaccines
ii) Epidemiology: pandemic,public health interventions, effect of preventive measures (economy, education, community, education)
Local and global responses, mitigation measures
Epidemiological principles in the spread (n super spreading) of COVID-19
Morbidity and mortality. Locally and globally
iii) Mental health health issues under the COCID-19 pandemic
Community and healthcare workers
Definition of RO, Re, flattening of the curve, epidemic curve
COVID-10 and socioeconomic status: locally and globally
iv). Communicating information about COVID-19 (aetiology, treatment, mitigation measures, vaccines)

C. ZIKA VIRUS

i). Virology and pathogenesis: positive-sense single-stranded RNA virus, Flaviviridae family, mosquito-borne viruses (Dengue Virus (DENV), West Nile fever virus (WNV), yellow fever virus (YEV)
ii) Epidemiology: Africa, Asia, Americas
iii). Transmission: -transmitted by mosquitoes, primarily the Aedes (Stegomyia) genus including other Aedes species (Ae.aegypti, Ae.africanus, Ae. Hensilli, Ae. Albopictus

- Nonvector transmission: congenital, perinatal, sexual, possibly blood transmission, animal bite

iv). Clinical manifestations: incubation period: 3-12 days,
Clinical features: subclinical, mild influenza –like illness, severe manifestations (Guillain- Barre syndrome in adults, microcephaly in babies born to infected mothers
Asymptomic in most cases, all ages are affected
Symptomatic: mild, self-limiting, nonspecific: rash, fever, arthralgia, myalgia, fatigue, headache, conjunctivitis
Severe symptoms: microcephaly in infants
v). Laboratorty invdestigations: often, normal blood count, non-specific changes: mild lymphopenia, mild neutropenia, mild-to-moderate thrombocytopenia
vi). Diagnosis: Clinical evaluation unreliable.
Laboratory testing important to avoid clinical overlap with other arbor viruses (Chikungunya virus (CHIKV), Dengue virus (DENV).
PCR- based assay
Molecular amplification (RT-PCR) on serum, specific diagnostic
Serology testing limited, cross reactivity (IgM and IgG
Urine and saliva may be used
vii).Management and Prevention: No specific treatment available

Supportive management: rest, fluids, antipyretics, analgesics (aspirin and nonsteroidal antinflammatory drugs to be avoided.
viii).Prevention: prevent mosquito bites: personal level, insect repellents, bed nets
Community level: eliminate potential mosquito breeding sites, potted plants, water storage units, insecticide spraying, serial foetal monitoring
D. Ebola Virus (EBOV): Ebola virus disease (EVD), EBOVA Makona
i.Virology and pathogenesis: Member of the Ebola virus genus, Filoviridae family of negative-sense, single- stranded , acute haemorrhagic fever
Discovery history
ii) Epidemiolgy:West Africa, East Africa
iii). Signs and symptoms: fever, aches and pains (severe headaches , muscle and joint pains), weakness and fatigue, sore throat, loss of apetite, gastrointestinal symptoms (abdominal pain, diarhea, vomiting), unexplained haemorrhage, bleeding or bruising, red eyes, skin rash, hiccups (late-stage), mimicking influenza, malaria or typhoid fever
EVD: rare, severe deadly
Antobodies to infection detectable in blood, 10 years after recovery
iii). Transmission: contact with an infected animal (fruit bat, nonhuman primate), spillover event:
person to person, large numbers infected
spreads: direct contact,broken skin or mucous membrane, eyes, nose, mouth: body fluids (urine, saliva, sweat, faeces, vomit, breast, amniotic fluid, semen, sick person or dead
infected fruit bats ,nonhuman primates (apes and monkeys)
semen (recovered person (oral, vaginal or oral sex), vaginal fluids of infected person
Incubation period
Spread only when one is symptomatic
iv). Risk: Healthcare workers while caring for Ebola patients, family and friends.
Little risk for travellers or general public except close contact with sick person (3 feet or 1 metre)
v). Persistence of the virus:

F. Hepatitis A, B, C

Hepatitis A (HAV)

i) Virology: enterovirus picornavirus, highly infectious, pathophysiology
ii) Transmission: faecal-oral route spread, asymptomatic infected persons excrete in faeces for 2-3 weeks, common infection in children, overcrowding and poor sanitation, outbreaks, water and shellfish transmission, no chronic carrier status
iii) Investigations: HAV antigen, anti HAV-antigen, IgM antibodies for diagnosis
Excreted in stool 7-14 days,
iv) Clinical features: Acute hepatitis acute liver faiulure, aplastic anemia, chronic liver disease, cirrhosis, relapsing hepatitis
Usually self-limiting
Severity age-related
Jaundice, dark urine
Enlarged tender liver
Malaise
Anorexia
Nausea
Splenomegaly
Rising levels of serum alanine and aspartate aminotransferase
High bilirubin level
v) IgM antibody to antigen HAV
vi) Management: Community level: prevention, improved social conditions
Individual level: immunisation, immune serum globulin

Hepatitis B (HBV)

i) Virology: hepatitis B virus; core DNA, DNA polymerase for replication, morphology
Hepatitis B core antigen (HBcAg)

Hepatitis B e antigen (HBeAg)
Chronic infection: presence of HBsAg and anti-HBc (IgG

ii) Clinical features: malaise, anorexia,, nausea, vomiting, hepatomegaly, splenomegaly
iii) Source of HBV: horizontal transmission-injection drug use, infected transfused blood,tattoo/acupuncture needles
Vertical transmission: HBsAg-positive mother
iv) Management: supportive treatment
Acute and Chronic HBV infection
Interferon-alfa, lamivudine
v) Prevention: Vaccine
vi) At risk groups: Sharing toothbrushes/ razor
Vertical transmission
Unscreened blood product
Needlestick injury
Iatrogenic parenteral transmission (contaminated needles)
Medical and nursing staff
Patients with chronic liver disease
Chronic dialysis patients

Hepatitis C virus (HCV)

Virology: RNA flavivirus, several genotypes
Signs and symptoms: Bleeding easily
Bruising easily
Fatigue
Poor appetite
Jaundice
Dark coloured urine
Itchy skin
Ascites
Weight loss
Confusion, drowsiness and slurred speech (hepatic encephalopathy)
Spiderlike blood vessels on the skin (spider angiomas)
Investigations: Serology and virology
Molecular analysis
Liver function tests
Liver histology
Management: Aim is to eradicate the infection
Pegylated α-interferon weekly subcutaneously, oral ribavirin; side effects
Treatment period
Liver transplant
Risk factors for progression to cirrhosis: male gender, immunosuppression, heavy alcohol
Misuse
Risk factors for acquiring chronic hepatitis C infection: IV drug abuse
Unscreened blood products
Vertical transmission
Needlestick injury
Iatrogenic parenteral transmission
Sharing toothbrush/razors

Renal and urinary tract Medicine

Clinical examination of the kidney and urinary tract

Applied anatomy and physiology

1. Approaches to the investigation of kidney ad urinary tract disease
2. Principles of kidney function in health and disease
3. Pathophysiology of signs and symptoms of kidney and urinary tract diseases
4. Clinical features of common kidney and urinary tract diseases
   - Urinary tract infection
   - Loin pain
   - Abnormal micturition
   - Erectile dysfunction
   - Haematuria
   - Proteinuria
   - Oedema
   - Hypertension
   - Acute renal failure
   - Chronic kidney disease (chronic, renal failure)
5. Renal replacement therapy
6. Renal vascular disease
7. Glomerular diseases
   - Glomerulonephritis
   - Inherited glomerular disease
8. Tubulo- interstitial diseases
   - Interstitial nephritis
   - Cystic kidney disease
   - Isolated defects of tubular function
9. Diseases of the collecting system and ureters
10. Diseases of the lower genitourinary tract
11. Diseases of the prostate gland
12. Tumours of the kidney and the urinary tract
    - Tumours of the kidney
    - Tumours of the renal pelvis, ureters, and bladder
13. Renal involvement in systemic conditions
14. Drugs and the kidney

Gastrointestinal (GIT) Medicine

Clinical examination of the gastrointestinal system

Basic sciences: applied anatomy and physiology Principles of GIT function in health and disease

Pathophysiology of signs and symptoms of GIT tract diseases

Clinical features of common GIT tract diseases

Approaches to the investigation of GIT diseases

Principles of GIT function in health and disease

Presentation of GIT diseases: dysphagia, dyspepsia, vomiting, GIT bleeding, diarrhoea, malabsorption, weight loss, constipation, abdominal pain

Diseases of the mouth and salivary glands

Diseases of the oesophagus: gastrooesophageal reflux, motility disorders, tumours of the oesophagus, perforation of the oesophagus, congenital malformations, bleeding

Diseases of the stomach and duodenum: gastritis, peptic and duodenal ulcers, functional disorders, tumours of the stomach

Diseases of the small intestines: disorders causing malabsorption, motility disorders, miscellaneous disorders of the small intestine, adverse food reactions, infections of the small intestines, tumours of the small intestines

Diseases of the pancreas: acute pancreatitis, chronic pancreatitis, congenital malformations, tumours of the pancreas

Inflammatory bowel disease
Irritable bowel syndrome
Ischaemic gut injury
Disorders of the colon and rectum**:** tumours of the colon and rectum, diverticulosis, constipation disorders, of defaecation, colonic infections, anorectal disorders, diseases of the peritoneal cavity

Liver and biliary tract diseases

Clinical examination of the abdomen for liver and biliary diseases
Applied anatomy and physiology of the liver and biliary system
Hepatobiliary disease investigations
Tests: (liver function, haematological, immunological,), radiological imaging, liver biopsy, non-invasive markers of hepatic fibrosis
Clinical presentation of liver diseases
Abnormal liver function tests
Jaundice
Acute liver failure
Hepatomegaly
Variceal bleeding
Ascites
Hepatic encephalopathy
Cirrhosis
Portal hypertension
Hepatic infectious diseases
Viral hepatitis
HIV liver infection
Alcoholic liver disease
Non-alcoholic fatty liver disease
Drugs, toxins and the liver
Hepatotoxic drug reactions
Inherited liver diseases
Haemochromatosis
Wilson disease
Alpha, antitrypsin deficiency
Gilbert syndrome
Autoimmune hepatitis
Intrahepatic biliary diseases
Primary biliary cirrhosis
Secondary biliary cirrhosis
Primary sclerosing cholangitis
Cystic and fibropolycystic disease
Intrahepatic cholestasis
Liver tumours and focal hepatic lesions
Hepatocellular carcinoma
Secondary malignant tumours
Benign tumours
Liver abscess
Vascular hepatic diseases
Hepatic arterial disease
Portal venous thrombosis
Hepatopulmonary syndrome
Portopulmonary hypertension
Hepatic venous outflow obstruction
Nodular regenerative hyperplasia of the liver
Pregnancy and the liver
Intercurrent and pre-existing liver diseases
Pregnancy- associated liver disease
Liver transplantation

Gallbladder and extrahepatic biliary disease

Gallstones
Cholecystitis
Choledocholithiasis
Tumours of the gallbladder and bile duct

Endocrine Medicine

Clinical examination in endocrine diseases
Functional anatomy and physiology
Endocrine pathology
Investigations of endocrine diseases
Imaging Techniques: role and interpretation of imaging techniques in diagnosis and management of Endocrine disease

1. Principles of endocrine function in health and disease
2. Pathophysiology of signs and symptoms of disorders
3. Clinical features of common endocrine diseases
4. Approaches to the investigation of endocrine diseases
5. Causes, diagnosis, management and care of patients with disorders of the hypothalamus, pituitary gland
6. Basal and dynamic tests of pituitary function
7. Management of functioning and non-functioning pituitary gland
8. Diagnose and manage hypopituitarism, diabetes insipidus
9. Managing patients during and after pituitary tumour surgery
10. Diagnose and manage patients with SIADH, thirst dysregulation and other water balance disorders
11. Disorders of growth: assessment of normal growth, pubertal stages and treat growth disorders
12. **Disorders of the thyroid gland**
13. Anatomy and physiology
    Clinical features: thyrotoxicosis, hypothyroidism, asymptomatic abnormal thyroid function tests thyroid enlargement, autoimmune thyroid disease, transient thyroiditis, iodine-associated thyroid disease, simple and multinodular goitre, thyroid neoplasia, congenital thyroid disease
14. **Parathyroid glands**: Functional anatomy and physiology
    Investigation of parathyroid diseases
    Disorders of the parathyroid:
    Clinical features: hypercalcaemia,
    hypocalcaemia,
    primary hyperthyroidism,
    familial hypocalciuric,
    hypercalcaemia,
    hypothyroidism
15. Other endocrine and metabolic disorders:
    hypoglycaemia,
    neuroendocrine tumours
    ectopic hormone production
16. **Adrenal glands**
    Functional anatomy and physiology
    Clinical features:
        Cushing's syndrome
        Therapeutic use of glucocorticoids
        Adrenal insufficiency
        Incidental adrenal mass
        Primary hyperaldosteronism
        Phaeochromocytoma and paragangloma
        Congenital adrenal hyperplasia

17. **The reproductive system**:

Functional anatomy and physiology

Investigations of diseases of the reproductive system

Clinical features

Delayed puberty

Amenorrhea

Male hypogonadism

Infertility

Gynaecomastia

Hirsutism

Klinefelter syndrome

Polycystic ovarian syndrome

Turner's syndrome

Testicular tumours

18. **The hypothalamus and pituitary gland**

Applied physiology and anatomy

Investigations of diseases of the hypothalamus and pituitary gland

Clinical features

Pituitary disease

Hypopituitarism

Pituitary tumour

Hyperprolactaemia/galactorrhea

Prolactinoma

Acromegaly

Craniopharyngioma

Diabetes insipidus**19. Diseases affecting multiple endocrine glands**

Multiple endocrine neoplasia

Werner's syndrome

Sipple's syndrome

20. Autoimmune polyendocrine syndromes

Type 1 and Type 2

Type 1

Addison's disease

Hypoparathyroidism

Type 1 diabetes

Primary hypothyroidism

Chronic mucocutaneous candidiasis

Nail dystrophy

Dental enamel hypoplasia

Type 2

Addison's disease

Primary hypothyroidism

Grave's disease

Pernicious anaemia

Primary hypogonadism

Type 1 diabetes

Vitiligo

Coeliac disease

Myasthenia gravis

Diabetology (Diabetes Mellitus, DM)

1. Pathophysiology of signs and symptoms
2. Clinical features
3. History taking and examination
4. Management of diabetic patients
5. Multidisciplinary care approach
6. Acceptable target range of Hb1Ac for diabetic patients
7. Approaches to investigation
8. Systemic manifestations : eye diseases,renal diseases and hypertension, neuropathy and erectile dysfunction, foot disease, lipid disease, diabetic retinopathy
9. Predisposing factors and prevention measures
10. Role of information technology in diabetic care
11. Diabetic care support groups
12. Pathophysiology of metabolic disturbances and principles of management
13. Pathophysiology of metabolic disturbances and principles of management, investigation, prevention: hyperglycaemic and hypogycaemic emergenc
14. Impact of other treatments on management of glycaemia:steroids/parenteral nutrition
15. Interaction of surgery/acute illness and diabetes
16. Diabetes in conception and pregnancy,contraception, surgery,cardiovascular and cerebrovascular illnesses
17. Age-related conditions and diabetes: young people, elderly, co-morbidities in the elderly
18. Effect of diabetes on growth, physiological and psycho-social factors affecting glycaemia, effect of individual behaviour
19. Therapeutics to take into account co-morbidities and other medications patient is taking

Neurological Medicine

1. Principles of neurological function in health and disease
2. Pathophysiology of signs and symptoms of neurological diseases
3. Clinical examination of the nervous system
4. Applied anatomy of the nervous system
5. Approaches to the investigation of neurological diseases
6. Clinical features of common neurological diseases
   Headache and facial pain
   Dizziness, blackouts and funny turns
   Sleep disturbance
   Weakness
   Abnormal gait
   Disorders of balance
   Abnormal movements
   Sensory disturbance
   Coma
   Acute confusional state
   Memory loss
   Personality change
   Speech and language disturbance
   Disorder of perception
   Brain-stem lesions
   Swallowing difficulty
   Visual disturbance and other ocular abnormalities
   Sphincter disturbance

Headache syndromes
Vestibular disorders
Epilepsy
Sleep disorders
Cerebrovascular disease
Stroke
Subarachnoid haemorrhage
Cerebral venous disease
Inflammatory diseases
Neurodegenerative diseases
Infections of the nervous system

Meningitis
Parenchymal viral infections
Parenchymal bacterial infections
Diseases caused by bacterial toxins
Transmissible spongiform encephalopathies
Intracranial mass lesions and raised intracranial pressure
Raised intracranial pressure
Intracranial neoplasms
Paraneoplastic neurological disease
Hydrocephalus
Idiopathic intracranial hypertension
Disorders of the spine and spinal cord
Cervical spondylosis
Lumbar spondylosis
Spinal cord compression
Intrinsic diseases of the spinal cord
Diseases of peripheral nerves
Disorders of the neuromuscular junction
Diseases of muscle

Haematology & Medical Oncology

1. Principles of blood, bone marrow and reticulo-endothelial function in health and disease
2. Clinical examination in blood diseases
3. Approaches to the investigation of haematological disorders and neoplastic disorders
   The full blood count
   Blood film examination
   Bone marrow examination
   Investigation of coagulation

4. Applied anatomy and physiology
   Haematopoiesis
   Blood cells and their functions
   Haemostasis
5. Pathophysiology of signs and symptoms of haematological disorders and cancer diseases
6. Clinical features of common haematological disorders
   Anaemia
   High haemoglobin
   Leucopaenia
   Leucocytosis
   Lymphadenopathy
   Splenomegaly
   Bleeding
   Thrombocytopenia
   Thrombocytosis
   Pancytopenia
   Infection
   Venous thrombosis

Blood products and transfusion
Blood products
Adverse effects of transfusion
Safe transfusion procedures
Bone marrow and peripheral blood stem cell transplantation
Allogenic BMT
Autologous BMT
Anticoagulant and antithrombotic therapy
Heparins

- Courmains
- Prophylaxis of venous thrombosis

Anaemias
- Iron deficiency anaemia
- Anaemia of chronic disease
- Megaloblastic anaemia
- Haemolytic anaemia

Haemoglobinopathies

Haematological malignancies
- Leukaemias
- Lymphomas
- Paraproteinamias

Aplastic anaemia
- Primary idiopathic acquired aplastic anaemia
- Secondary aplastic anaemia

Myeloproliferative disorders

Bleeding disorders
- Disorders of primary haemostasis
- Coagulation disorders

Thrombotic disorders

Oncology

Clinical examination of the cancer patient

Applied anatomy and physiology

Environmental and genetic determinants of cancer

Investigations in oncology
- Histology
- Imaging
- Biochemical markers

Clinical features in oncology
- Palpable mass
- Weight loss and fever
- Finger clubbing
- Ectopic hormone production
- Neurological paraneoplastic syndromes
- Cutaneous manifestation of cancer

Emergency complications of cancer

Metastatic disease

Therapeutics in oncology
- Surgery
- Systemic chemotherapy
- Radiation therapy
- Hormone therapy
- Immunotherapy
- Biological therapies

Specific cancers in South Sudan

Musculoskeletal diseases

Clinical examination of the musculoskeletal system

Applied anatomy and physiology

Investigation of musculoskeletal diseases

Synovial fluid analysis

Imaging

Blood tests

Tissue sampling

Electromyography

Clinical features

Pain in a single joint

Oligoarthritis

Polyarthritis

Fracture

Bone pain without fracture

Regional periarticular pain

Back and neck pain

Muscle pain and weakness

Rheumatic disease presenting as systemic illness

Principles of management of musculoskeletal disorders

Core interventions

Pharmacological options for direct symptom control

Non- pharmacological interventions

Osteoarthritis

Inflammatory joint disease

Rheumatoid arthritis

Seronegative spondylitis

Crystal associated disease

Bone and joint infection

Fibromyalgia

Systemic connective tissue disease

Systemic lupus erythematosus

Systemic sclerosis

Mixed connective tissue disease

Sjogren syndrome

Polymyositis and dermatomyositis

Systemic vasculitis

Disease of bone

Osteoporosis

Osteomalacia and rickets

Paget's disease

Primary tumours of the musculoskeletal system

Metastatic bone disease

Other bone diseases

Rare inherited disorders of the bone

Musculoskeletal presentation of diseases in other systems
Miscellaneous conditions

Rheumatology

Clinical examination of the patient for rheumatologic disorders

Epidemiology
Aetiology
Principles of bone and joint function in health and disease
Pathophysiology of signs and symptoms of rheumatologic disorders
Clinical features of common rheumatologic disorders.
Approaches to the investigation of rheumatologic disorders
Spinal pain
Osteoarthritis
Systemic manifestations: respiratory, ocular, neurological, haematological, dermatological

Musculoskeletal pain problems and soft tissues rheumatism

Emergency Medicine/Intensive Care Unit

Skills

1. Clinical care skills

History and examination
Documentation
Decision making
Time management
Safe prescribing
Continuity of care
Therapeutic interventions

2. Communication skills

With: colleagues, patients and caregivers, family, breaking bad news, team members

3. Maintaining good medical practice-lifelong learning

Audit and clinical outcomes
Critical appraisal
Information management

4. Ethical professional: behaviour, probity, professional attributes, career and professional development

5. Ethics and legal issues

Learning Objectives

Acquire basic life support skills: diagnosis of and treatment of shock, basic procedural skills, demonstrate the skills on real patients or simulation
Demonstrate capacity to differentiate and treat common acute problems
Carry out comprehensive assessment of a patient
Demonstrate proficiency in basic life support skills and cardiopulmonary resuscitation
Recognise and initiate first aid for airway obstruction
Recognise and intervene in managing shock in patients of all ages
Able to rapidly resuscitate and stabilise a patient with intravenous fluid/blood administration
Understand principles of management of patients with cerebral illness
Demonstrate proficiency in using a defibrillator
Understand principles of wound care
Understand principles of trauma management, basic trauma management skills, ABC approach, and full spine immobilisation
Demonstrate mastery of basic procedures: venous access, airway management
Recognise life-threatening illness and injury, basic stabilisation
Demonstrate capacity to prioritise patients

Acute care common stem

Assessment of an acutely ill patient
Commencement of resuscitation
Diagnose most likely underlying problem
Institute appropriate investigations
Basic life support

Respiratory Diseases

Applied respiratory anatomy and physiology
Normal arterial blood gas
Differential diagnosis diagnostic approach, respiratory distress, acute hypoxia, hypercarbia
Management of respiratory distress: acute pulmonary embolism, upper airway obstruction, status asthmatics, pneumonia and ARDS.
Indications for intubation and mechanical ventilation
Airway obstruction
Respiratory failure
Cardio-respiratory arrest
Cardio-pulmonary resuscitation (necessary resuscitation equipment and medications)
Apnea
Breathing difficulty
Chest pain
Asthma
Shortness of breath
Pulmonary embolus
Pneumothorax
COPD
Pneumonia
Hyperventilation

Cardiovascular Disease

Applied cardiovascular physiology and anatomy
Determinants of cardiac output, principles of oxygen delivery
Understanding: preload, after load, contractility
Role vasopressors and inotropes
Hypotension
Orthostatic hypotension
Differential diagnosis of circulatory shock (cardiogenic, hypovolemic, obstructive, distributive
Diagnostic plan and management
Arrhythmias: recognise, supraventricular and ventricular arrhythmias, assessment of precipitating cause
Myocardial infarction - Recognition: initiate therapy, acute MI, identify potential complications
Shock
Cardiac arrest
Abdominal aortic aneurysm
Acute coronary syndromes
Thoracic aortic dissection aneurysm
Congestive heart failure
Angina pectoris
Stroke
Syncope
Basic elctrocardiographic analysis

Neurology

- Applied physiology and anatomy
- Epilepsy (grand mal,status epilepticus, petit mal seizur, partial seizures
- Anaphylaxis
- Allergic reaction
- Altered mental status
- Headache
- Intracranial haemorrhage
- Ischaemic stroke
- Meningitis
- Encephalitis
- Migraine
- Vertigo
- Acute stroke
- Acute mental status change

Trauma

- Chest trauma
- Neck trauma
- Abdominal trauma
- Closed head injury
- Cervical spine
- Spinal injury
- Maxillofacial trauma
- Burns
- Orthopaedic trauma
- Major trauma

Dental Emergencies

- Dental abscess
- Dental fractures
- Pain

Ear, Nose and Throat

- Epistaxis
- Infections of the head and neck
- Foreign body inhalation

Psychiatry

- Acute suicidal and homicidal ideation
- Agitation
- Anxiety
- Mood disorders
- Substance abuse
- Personality disorders

Paediatrics

- Basic management of paediatric airway
- Basic paediatric resuscitation
- Common infectious diseases of children
- Fever in the first 6 months of life
- Common injuries in children

Neonatology

- Neonatal resuscitation
- Hyperbilirubinemia
- Disorders of feeding
- Neonatal fever

Renal

Applied renal physiology and anatomy
Acute renal failure, oliguria, differential diagnosis, management
Indications for emergency dialysis
Acid-base balance, electrolyte disturbances, differential diagnosis, management

Gastrointestinal

Applied gastrointestinal and hepatic physiology
Acute abdomen, differential diagnosis, diagnostic approach, management
Gastrointestinal haemorrhage.
Differential diagnostic approach, management, indications for endoscopy
Liver dysfunction
Hepatic encephalopathy: differentials, diagnostic approach, management
Accidental poisoning
Dehydration due to diarrhoea
Abdominal pain
GI bleeding
Appendicitis
Biliary disease
Small bowel obstruction
Mesenteric ischemia
Perforated viscus
Acute hepatitis
Liver failure
Acute cholecystitis and cholangitis

Toxicology

Treatment of acute ingestion
Identification of basic toxidromes

Genitourinary

Ectopic pregnancy
PID + TOA
Ovarian torsion
Testicular torsion
Acute urinary retention
Nephrolithiasis and colic
Sexually transmitted diseases

Haematological Disease

Applied haematological physiology
Coagulopathy, differentials, diagnostic approach
Anaemia: indications for blood plasma products transfusion
Infectious Disease
Applied physiology and microbiology of common infections in ICU
Fever: differentials, diagnostic approach, management
Nosocomial pneumonia, catheter- related infections
Appropriate antibiotic therapy
Sickle-cell anaemia
Disorders of clotting

Metabolic/Nutrition/Endocrine and Electrolytes

Principles of nutrition: enteral, parental
Nutritional status evaluation, differences with a critically ill patient
Sodium or glucose imbalance
Potassium imbalance
Diabetic keto-acidosis
Hyperglycaemia
Hypoglycaemia
Hyperkalaemia
Thyroid storm
Acute adrenal crisis
Myxedema

Dermatology

Blistering and exfoliative diseases
Differential diagnosis of rash
Parasitic and infestations

Rheumatology and Immunology

Crystalline arthropathy
Arthritis
Immune disorders
Anaphylaxis

Infectious Disease and sepsis

Endemic infectious disease
Sepsis
Common infectious diseases or conditions (pneumonia)

Pain and Psychosocial

Pharmacology: principles of management of sedation, anxiety and pain
Recognise, manage, psychosocial issues, family, patient caused by catastrophic illness
Ethical issues
Decisions
Patient autonomy
Informed consent
Directives
Therapy: withholding, withdrawing
End of life discussions/decisions
Psychiatry proble

General conditions

Major trauma
Heat stroke
Snake bites/stings
Scorpion bites
Sepsis
Burns and scalds
Smoke inhalation
Drowning
Acute compartment syndrome
Hyperthemia
Hypothemia

Objectives for Procedures

Student should develop basic competency in:
Central venous access: internal jugular, subclavian, femoral artery, intravenous line
Endotracheal intubation
Arterial line insertion: radial artery, femoral artery
Chest tube insertion
Electro cardio version

Teaching Methods

Bedside teaching Tutorial
Seminars
Lectures Operating room Small group teaching
Self- learning
Peer teaching and learning
Computer-based modules

Contact Hours

Minimum 15 hours per week

Tutorial - 5 hours per week
Seminars - 2 hours per week
Lectures - 1 hour per week
Operating room - 6 hours per week

Assessment Methods:

Shall include assessment of knowledge, skills, and attitudes and aligned to the learning outcomes

Continuous assessment: 40%

Log book- 5%
Written paper 15%
(Essay, MCQ, SBA, EMQ)
Clinical examination
OSCE- 20%

Long/short case

Final Examination 60%

Written: Paper I-Essay and short answer questions - 20%
Paper II MCQ - 10%
Clinical: OSCE - 25%
Oral examination - 5%

Pass mark: 50%.The clinical component must be passed to pass the course.

Recommended Text Books

1. Dorland J (2008). Dorland's Pocket Medical Dictionary. Saunders, Philadelphia. ISBN: 10141600108.
2. Elis H, Calne R, Watson C (2006). Lecture Notes in General Surgery. Wiley-Blackwell Publishers, New York, Oxford.ISBN: 978-1-4051-3911-3.
3. Lumley JSP, (1997). Hamilton Bailey's Demonstration of Physical Signs in Clinical Surgery. Hodder Arnold Publications, London.ISBN: 0750616210.
4. Tardiff J, Derr P, McEvoy M (2016). Emergency and Critical Care: Pocket Guide (8th Ed.) Jones and Bartllett Learning. ISBN-13:978-1284136999, ISBN-10:128413699.
5. Diepenbrock N, (2015). Quick Reference to Critical Care (5th Ed.). Lippincott Wilkins, ISBN-10:97814511194265
6. American Heart Association (2016). Basic Life Support (BLS). Channing L Bete Co Inc. ISBN-13: 978-1451194265, ISBN-10:1616694076.
7. Romello JM, Kvetan V, Pastores S (2016).Lange Critical Care (1st Ed). McGraw- Hill Education / Medical. ISBN-13:9780071820813, ISBN-10:9780071820813.

Journal and Websites to be advised by the lecturer.

Critical Care Medicine

Clinical examination of the critically ill patient

Physiology of critical illness

Oxygen transport
Cardiovascular component of oxygen delivery flow
Oxygen component of oxygen delivery content
Oxygen consumption
Relationship between oxygen consumption and delivery
Pathophysiology of the inflammatory response

Recognition and assessment of the critically ill patient

Recognition of the severity of the illness
Assessment and initial resuscitation of the critically ill patient
Approaches to the investigation of medical emergencies
Clinical decision making and referral to critical care

Clinical presentation and evaluation of the critically ill patient

Principles of critical care medicine
Circulatory failure (shock)
Respiratory failure (including cute respiratory distress syndrome, ARDS)
Acute kidney injury

Neurological failure (coma)
Sepsis
Disseminated intravascular coagulation (DIC)

General principles of critical care management

Monitoring
Daily clinical management in the ICU

Management of major organ failure

Circulatory support
Respiratory support
Renal support
Gastrointestinal and hepatic support
Neurological support
Management of sepsis

Discharge from intensive care

Withdrawal of care
Brain-stem death

Scoring systems in intensive care

Outcome of intensive care

Geriatric Medicine

1. Basic sciences:
   i).Ageing: physical and cognitive function, immune competence, personality
   Pharmacokinetics and pharmaco-dynamic
   ii.) Biochemical, molecular, cellular, genetic theories
   iii). anatomical and histological changes associate with ageing,
   iv). Pathology of normal ageing and associated disease processes
   v) Physiology of ageing
   vi) Specific disease process: dementia, delirium, depre3ssion, continence, osteoporosis, falls, Parkinsonism and movement disorders Alzheimer disease stroke
   vii) Multidisciplinary care
2. Professional approach to the older person: History taking, physical and mental state examination
3. Diagnosis and management of common elderly patient: i) multiple pathology: physical, psychological
   ii) Multiple drug therapy' polypharmacy; concept of safe prescription, differing physiology, drug Interactions
   iii) Falls
   iv) Mobility problems
   v) Incontinence-urinary, faecal
   vi) Pressure sore
   vii) Stroke
   viii) Confusion-acute and chronic
   ix) Communication or visual difficulties
   x) Terminal care
4. Role of carers
6. Rehabilitation, discharge plan, primary and secondary prevention
7. Ethical issues in care of the elderly: autonomy, mental capacity, euthanasia and assisted suicide, withdrawal and withholding of medical treatment, cardiopulmonary resuscitation
9. Communication skills: patients, family's carers, breaking bad news
11. Health and social services in the provision of long-term care of the elderly

Adolescent Medicine

Adolescent Health

1. Social history, screening for risk factors for potential morbidity and mortality
4. Health maintenance at different stages of adolescence
5. Immunisation for up to date and catch up

6. Screening: vision, hearing, blood pressure, haematocrit, vitamin D, cholesterol and lipids
7. Cultural competence and humility: socio-cultural aspects, cultural values, cultural sensitive healthcare
8. Harm reduction: primary and secondary prevention strategies for behavior change
9. Social determinants of health impact on adolescents
10. Guidance from parents for normal psychosocial development, parents' communication on sensitive issues
11. Physiologic development: sexual maturity raring, staging physiologic development, pubertal development
12. Social and cognitive development: continuum of development, brain maturation, executive function, influence on risk taking behaviour
13. Gender identity and sexual orientation: difference between gender identity and sexuality
14. Development of gender identity and sexual orientation
15. Health rights, reproductive health and psychiatric care, confidential treatments
16. Sexual and reproductive health: prescribing contraception to adolescents and young adults (cultural and legal issues)
17. Contraceptive methods: typical failure rates, mechanism of action, benefits, side effects, common myths, shared-making on contraceptives counselling
18. Pregnancy counselling: non-judgmental about pregnancy options and community resources
19. Public health impact: unintended pregnancy, abortion, teen parenting
20. Abortion: evidence-based information, medication, aspiration abortion, safety, efficacy, indications, expected side effects
21. Male reproductive health: male adolescent health care needs, sexual male sexual history
22. Sexual and gender minorities: screening LGBTQIA+ youth, sensitive language, evidence-based support
23. Sexually transmitted infections: guidelines for STI/HIV screening, prevention and clinical, diagnostic for pelvic inflammatory disease, vaginitis, urethritis
24. Menstrual cycle and common disorders: normal menstrual cycle, anovulatory cycling during pubertal development
25. Evaluation and management: amenorrhea, irregular menses, abnormal uterine bleeding, dysmenorrhea, options of menstrual regulation
26. Psychological and Behavioural health: screening mental health issues, depression, and anxiety, non-suicidal self- harm, suicidal ideation, referral, presentation and diagnosis of ADHD (early, middle, late adolescence and young adults, behavioural and pharmacologic treatments for ADHD management of suicidality
27. Eating disorders, overweight, obesity
28. Substance use and abuse, community resources
29. Safety and violence: physical, intimate partner violence, juvenile justice, bullying and cyberbullying

Teaching Methods and Teaching Hours:

Lectures -	6 hours per week
Bedside tutorials -	5 hours per week
Ward rounds/clinics/admissions -	12 hours per week
Seminars -	1 hour per week
Study guides and other student centred learning methods	
Problem-based case studies -	5 hours per week

Assessment Methods

Continuous assessment -	**40%.**
Student professional profiles - (Professionalism, team work skills, dress code, attendance)	5%
Log books –	5%
Portfolio-	?

Case write-ups – 10%
Clinical exams - 20%

Final Examination - 60%

Written papers - 30%
Clinical exams/OSCE- 30%
Long and short cases- ?

Assessment criteria: Knowledge of applied basic and clinical sciences, clinical competence, and professionalism and ethics. Failure in clinical competence means that the student fails that course. Assessment methods must reflect the learning objectives/learning outcomes.

Recommended Text Books

1. Swash, M. and Glynn M. (Eds) (2007). Hutchinson's Clinical Methods: An integrated approach to Clinical practice (22nd Edition). Edinburgh, London. Saunders Elsevier.ISBN 978 0 7020 27987.
2. Colledge NR, Walker BR, Ralston SH (Eds). Davidson's Principles and Practice of Medicine: a text book for students and doctors. (21st Ed). Churchill Livingstone. Edinburgh, 2010. ISBN 978-0-7020-3085-7
3. Bickley, L (2008). Bates' Guide to Physical Examination and History Taking (10th Ed). Lippincott Williams & Wilkins. ISBN-10: 0781780586.
4. Kumar P, Clark M. Clinical Medicine (13th Ed). Bailliere Tindall; London 1994.
5. Cook G. Mansons Tropical Medicine (20thEd). WB Saunders Company Ltd; London, 1996.
6. Macleod J. Clinical Examination (6th Ed.) Churchill Livingstone. Edinburgh, 198. Toghill PJ.

COURSE TITLE: INTERNAL MEDICINE SENIOR CLERKSHIP

Introduction

The goal of this clerkship is to assist the students to become competent in the basic assessment and management of common medical problems in internal medicine in readiness for pre-registration medical practice.

Pre-requisites: Internal Medicine Junior Clerkship

Course aims:

1. To learn to function as an internal junior house officer
2. Acquire the necessary responsibility and commitment to patient care
3. Developing compassion towards patients
4. Effectively working as a team
5. Improving clinical skills
6. History taking
7. Physical examination
8. Accurate oral and written presentation
9. Accurate diagnostic reasoning
10. Performing appropriate diagnostic and management procedures

Learning Outcomes/Course Objectives:

On completion of the course the student should be able to:

1. Obtain an accurate, appropriate, complete medical history and record it legibly
2. Conduct and record an accurate physical examination
3. Communicate with patients and their families in a manner that is facilitative, efficient, effective, and educative.
4. Identify social and psychologic issues that may be contributing to the patient's problems.
5. Using pathophysiology knowledge of the symptoms and signs establish clinical correlations on the disease
6. Offer differential diagnoses
7. Craft a plan to confirm the diagnosis
8. Obtain more information (text books, syllabus, journals, electronic resources) relating to the patient's disease.
9. On patient progress: observe, review, reassess, and record the progress in patient's log. Present your findings to the healthcare team.
10. Communicate clearly to colleagues and other members of the team
11. Take part in clinical procedures
12. Formulate a treatment plan for the patient in line with the needs of the patient
13. Formulate an ongoing health care plan for the patient aligned to their socio-economic status.

Content:

1. To acquire knowledge, skills, and attitudes with regards to the core problems in internal medicine: abdominal pain, chest pain, cough, dyspnoea, joint pain, anaemia, dysuria, weight loss, back pain, dysuria, altered mental status, fluids/electrolytes/acid/base balance disorders, congestive heart failure, COPD, depression, hypertension, diabetes/obesity, renal failure, common cancers, thyroid/parathyroid, HIV/AIDS, SARS-Cov-2. Emerging infectious diseases, malaria, nutrition, TB, pneumonia
2. To acquire knowledge, skills, and attitudes necessary for general and physical examination in internal medicine.
3. To acquire knowledge, skills and attitude necessary for prevention and rehabilitation aspects of diseases common in internal medicine.
4. To acquire knowledge, skills and attitudes for treatment and management of diseases common in internal medicine.
5. Ability to independently manage an outpatient clinic and a ward.

Teaching Methods

Clinical rotations
Bedside teaching
Tutorials
Seminars
Lectures
Web/ICT learning
Assessment

Assessment Methods

Continuous assessment -	**40%.**
Student professional profiles - (Professionalism, team work skills, dress code, attendance)	5%
Log books – Portfolio-	5%
Case write-ups –	10%
Clinical exams -	20%
Final Examination -	**60%**
Written papers -	30%
Clinical exams/OSCE- Long and short cases-	30%

Assessment criteria: Knowledge of applied basic and clinical sciences, clinical competence, and professionalism and ethics. Failure in clinical competence means that the student fails that course. Assessment methods must reflect the learning objectives/learning outcomes.

Recommended Text Books

1. Glynn M, Drake E (Editors) (2017). Hutchinson's Clinical Methods: An integrated approach to clinical practice (24th Edition). Elsevier. ISBN-13:978-0702067396, ISBN-10:0702067393;
2. Bickley L. (2008). Bate's Guide to Physical Examination and History Taking (12th Edition). Lippincott Williams and Wilkins. ISBN-13: 978-14699893149, ISBN-10:978-1469893419.
3. Kumar P, Clark ML. (2016. Kumar and Clark's Clinical Medicine (9th Edition). Elsevier. ISBN-13:978-0702066016, ISBN-10:9880702066016.
4. Ralston SH, Penman ID, Strachan MW, Hobson R (Editors) (2018). Davidson's Principles and Practice of Medicine (23rd Edition). Elsevier. ISBN-13: 978-0702070280.ISBN-10:0702070289.

Journals and Websites to be advised by the lecturer

(2) Course title: General Surgery

Credit hours: 35

Contact hours: 135

Clinical Rounds: 1890

Semesters for the courses to be taught: SVI(Credit hours:8, Contact hours:30, Clinical Rounds:270), S IX(Credit hours:15, Contact hours:45, Clinical Rounds:540), SXI (Credit hours: 12, Contact hours: 60, Clinical Rounds: 360), SXII (Credit hours: 16, Clinical Rounds: 720)

COURSE TITLE: SURGERY JUNIOR CLERKSHIP

Introduction

This course introduces the principles and practice of surgery with emphasis on the surgical pathology seen in South Sudan. Students will learn the clinical examination of a surgical patient and inculcate the appropriate attitude skills in the practice of surgery.

Course Objectives

Knowledge Objectives

At the end of the course the student should be able to:

1. Explain the physiological, anatomical and pathological basis of surgical disease;
2. Recognize symptoms and signs of the common surgical disease conditions;
3. Analyse symptoms and signs of surgical disease processes to arrive at a differential diagnosis;
4. Identify and interpret laboratory, imaging, and bedside investigations required to make a diagnosis and/or monitor clinical progress.

Skills Objectives

At the end of the course the student should be able to:

1. Obtain a detailed clinical history from the surgical patient;
2. Elicit physical signs in a patient with emphasis on correct techniques;
3. Perform basic surgical procedures

Attitudinal Objectives

At the end of the course the student should have:

1. Awareness of medical ethics with regard to confidentiality of information, privacy, religious and cultural beliefs;
2. Awareness of his/her professional limitations;
3. Commitment to lifelong learning;
4. Respect for other health care professionals;
5. Cultivated attributes such as responsibility, sense of duty, punctuality.

Course Content:

Introduction to Surgery

1. The doctor and the health care team, the doctor-patient relationship
2. History taking in the surgical patient.
3. Physical examination technique by system.
4. Laboratory and radiological investigations, imaging, and investigations in surgery.
5. Endoscopic investigations e.g. oesophagoscopy, bronchoscopy, laparoscopy.
6. The operating theatre, sterility, asepsis.
7. Infection prevention and control.

Basic Principles of Surgery

1. Hypovolaemic and septic shock, fluid and electrolyte balance.
2. Blood transfusion, blood and blood products.
3. Monitoring the surgical patient.
4. The critically injured patient-assessment and management.
5. Surgical emergencies.
6. Common medical conditions in surgery: HIV in surgery, congestive cardiac failure, hypertension, diabetes, obesity and malnutrition, endocrine disorders, jaundice and the uraemic patient.
7. Pre-operative management and preparation of a patient for surgery
8. Peri-operative assessment.
9. Post- operative management
10. Assist during surgical operation
11. Body response to injury
12. Surgical wounds and infections
13. Surgical infection
14. Antibiotics in surgery
15. Pain management in surgical
16. Management of comatose patients
17. Use of blood in surgery
18. Fluid and electrolytes therapy in surgical patient
19. Principles of surgical jaundice
20. Shock in surgical patient
21. General principles of trauma management
22. Stomas
23. Tubes and drains
24. Acute limb ischaemia
25. Principal of vascular surgery
26. Neurosurgery
27. Pediatric surgery
28. Skin conditions in surgery
29. Tropical surgery Hydatid disease, Madura etc
30. Nutrition in surgery

Gastrointestinal system

Oesophagus

1. Signs and symptoms of oesophageal pathology
2. Approaches to investigation of oesophageal disorders
3. Diverticular
4. Strictures
5. Achalasia
6. Esophageal cancers
7. Barrete oesophagus
8. Gastroesophageal reflux disease
9. Hiatus hernia
10. Esophageal varices
11. Portal hypertension
12. Congenital anomalies

Stomach

1. Signs and symptoms of stomach pathology
2. Approaches to investigation of stomach disorders

Intestines

1. Signs and symptoms of intestinal pathology
2. Approaches to investigating disorders of the intestines
3. Gastric outlet obstruction
4. Peptic ulcer disease

Anal conditions

1. Signs and symptoms of anal pathology
2. Approaches to investigating disorders of the anal region

Liver and Biliary Tree

1. Signs and symptoms of liver pathology
2. Approaches to investigating disorders of the liver and biliary tree
3. Obstructive jaundice
4. Anomalies of the biliary tree

Pancreas

1. Signs and symptoms of pancreatic disorders
2. Approaches to investigating disorders of the pancreas

Paediatric conditions of the gastrointestinal tract:

1. Intussusception,
2. Pyloric hypertrophic stenosis,
3. Worm obstruction,
4. Congenital bands,
5. Hirschsprung's disease
6. Imperforate anus

Hernia

1. Definition of a hernia.
2. Clinical examination and anatomical considerations.
3. Classification of hernias.
4. Clinical presentation of umbilical, paraumbilical, diaphragmatic, inguinal, femoral, spegilian and incisional hernias.

Respiratory Tract.

1. Signs and symptoms of upper airway obstruction
2. Methods of airway access

Signs and Symptoms of Traumatic Conditions

1. Fracture ribs
2. Flail chest
3. Pneumothorax
4. Haemo-pneumothorax
5. Diaphragmatic trauma
6. Principles of trauma in general
7. Head and neck injuries
8. Chest injury
9. Abdomen and pelvis

Chest drainage

1. Tumours of the thorax
2. Investigations of the respiratory system

The Nervous System

1. Neurological examination and examination of cranial nerves.
2. Assessment of head injury patient
3. Congenital anomalies of the nervous system
4. Urological, gastrointestinal, respiratory and musculoskeletal problems of the spinal injury patient
5. Peripheral neuropathy and nerve injuries
6. Investigations of the nervous system

The Cardiovascular System

1. Surgical anatomy of the cardiovascular system
2. History taking and examination of the patient with cardiovascular pathology
3. Signs and symptoms of cardiovascular disorders
4. Investigations of the cardiovascular system

The Endocrine System

1. Basic surgical anatomy
2. Physiology and pathology of the endocrine system
3. Laboratory and radiological investigations of the endocrine system
4. Pituitary gland: tumours and clinical presentation
5. Hyperparathyroidism

The Thyroid Gland:

1. Colloid goitre
2. Thyrotoxicosis
3. Tumours
4. Symptoms, signs and investigations;
5. Complications of thyroid disease.

The Pancreas

1. Diabetes
2. Tumours
3. Pancreatitis
4. Stress on pancreatic head cancer
5. Pseudocyst of the pancreas
6. Outline of pancreatic surgery

The Adrenal Gland:

1. Tumours and clinical manifestations;
2. Secondary hypertension in surgical practice

The Breast:

1. Anatomy and physiology
2. Functions and disorders of the breast
3. Benign and malignant lesions of the breast,
4. Differential diagnosis and investigations
5. Cancer of the breast
6. Axillary lymph node and axillary surgery

The Integumentary System

1. Surgical anatomy and functions of the skin
2. Symptoms and signs of infections and other surgical disorders of the skin
3. Investigation of surgical conditions of the skin

The Burned Patient

1. Percent surface area estimation
2. Fluid replacement
3. Immediate management.
4. Complications in the burns patient
5. Grafting

Common ulcers and lumps in skin and sub-dermal structures

1. Melanoma
2. Basal cell carcinoma
3. Squamous cell carcinoma
4. Naevi

Pigmented lesions of the skin; differential diagnosis and biopsy

Ulcers of varying aetiology

Haemopoietic and Lymphoreticular System

1. Haemopoiesis.
2. Haemolytic disease in surgery.
3. Bleeding disorders and haemostasis.
4. Disorders of immunity.
5. Lymphoedema.

Spleen

1. Signs and symptoms of splenic disorders;
2. Approaches to investigating disorders of the spleen.

Head and Neck

1. Surgical anatomy of the head and neck.
2. History taking and examination of the patient with head and neck pathology.
3. Signs and symptoms of head and neck disorders.

Urology

1. Surgical anatomy of the genitourinary system.
2. Congenital anomalies and infections of the urinary tract and genitalia.

3. Signs and symptoms of disorders of the genitourinary tract.
4. Physical examination including digital rectal examination.
5. Laboratory and radiological investigations of the urinary tract.
6. Trauma to the genitourinary tract.
7. Common urological emergencies.
8. Common urological conditions.
9. Common urological malignancies.
10. Basic urological procedures (urethral catheterization, suprapubic cystostomy).
11. Basic equipment and materials in urology:
12. Kidney neoplasia
13. Renal stones
14. Ureteric condition
15. Bladder outlet obstruction
16. Bladder stones
17. Benign prostatic hyperplasia
18. Carcinoma of the prostate
19. Scrotal conditions
20. Bladder cancer
21. Haematuria
22. General principles of cancer surgery
23. Transplant surgery
24. Endoscopic surgery

Catheters of various types

1. Bougies;
2. Cystoscopes.

Introduction of technology in urology.

Surgical Gynaecology

Examination of internal and external genitalia.

Common gynaecological conditions encountered in surgical practice:

1. Fibroid uterus;
2. Ectopic pregnancy;
3. Tubo-ovarian mass;
4. Pelvic inflammatory disease.

Paediatric Surgery

1. Surgical anatomy of the pediatric patient.
2. History taking and examination of the pediatric pathology.
3. Signs and symptoms of pediatric disorders.
4. Investigation of pediatric disorders.

Laboratory Investigations

Performing and pre-operative of basic tests such as:

1. Full blood count;
2. Urea electrolytes;
3. Liver function tests;
4. Urinalysis;
5. Bacterial cultures;
6. Cerebrospinal fluid analysis;
7. Fine Needle Aspiration (FNA).

Surgical Radiology

Interpretation of radiographs of the:

1. Chest;
2. Abdomen;
3. Skull;
4. Spine;
5. Limbs.
6. Indications for and interpretation of contrast studies.

7. Introduction to ultrasonography.
8. Introduction to current advances in diagnostic imaging.

Teaching/Training Methods and Contact Hours

Bedside teaching -	Minimum15 hours/week
Lectures -	1 hour/week
Seminars -	2 hours/week
Tutorials -	5 hours/week
Operating theatre -	6 hours/week
Total -	35 hours/week

Small group teaching and other techniques such as student oriented teaching; self-learning, peer teaching and computer based modules shall be encouraged where appropriate and when possible.

Assessment Methods

Assessment shall include assessment of knowledge, skills and attitudes:

Continuous Assessment-	**40%**
Evaluation of the log-book:	5%
Written exam- MCQs, Portfolio:	15%.
OSCE –	20%
Final Examination –	**60%**
Written: Paper I- Essays and short answer questions –	20%.
Paper II - Multiple Choice questions –	10%
Clinical: OSCE-	25%
Final oral exam-	5%.

Pass mark: 50% or better: the clinical component must be passed in order to pass the Examination.

Journals and Website to be advised by the lecturer

Recommended Text Books

1. Williams NO, O'Connel PR, McCaskie. (Editors, 2018). Bailey and Love's Short Practice of Surgery (27th Edition). CRTC Press.ISBN.-13:978-1498796507, ISBN-10:1498796508.
2. Beauchamp RD, Kenneth L, Maltox B et. Al. Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice. ISBN: 141603765X; ISBN13: 9781416036753
3. Brunicardi FC et al. Schwartz's Principles of Suregry 11th Edition. PDF downloadable on Google.
4. Dorland, (2008). Dorland's Pocket Medical Dictionary, Saunders, Philadelphia. ISBN: 101416001018.
5. Ellis, H., Calne, R. and Watson, C. (2006). Lecture Notes: General Surgery, Wiley-Blackwell Publishers, New York, Oxford. ISBN: 978-1-4051-3911-3.
6. Lumley, J.S.P (1997). Hamilton Bailey's Demonstrations of Physical Signs in Clinical Surgery, Hodder Arnold Publications, London. ISBN: 0750616210.
7. McRae, R. (2004). Clinical Orthopaedic Examination, Churchill-Livingstone, Edinburgh.ISBN: 0443074070.
8. Solomon, L., Warwick, J.D. and Nayagam, S. (2005). Apley's Concise System of Orthopaedics and Fractures, Hodder Arnold Publications, London. ISBN 0 407 40656 5.
9. Williams, N.S., Bulstrode C.J.K. and O'Connell R.P. (2008) Eds. Bailey and Love's Short Practice of Surgery, 25th Edition, Hodder Arnold Publications, London. ISBN: 034093932X.
10. Agur, A.M.R. and Dalley, A.F. (2008). Grant's Atlas of Anatomy, 12th Edition, 8. Lippincott, Williams and Wilkins, Baltimore. ISBN: 0-7817-7055-6.
11. Apley, G., Solomon, L., Warwick, D. and Nayagam, S. (2001). Apley's System of Orthopaedics and Fractures, Hodder Arnold Publications, London. ISBN: 0-407-40656-5.
12. Ellis, H. and Watson, C. (2001). Pocket Diagnosis in General Surgery: A Companion to Lecture Notes, Wiley-Blackwell Publishers, New York, London. ISBN: 978-0-632-05479-4.
13. Hamblen, D. and Simpson, H. (1997). Adam's Outline of Fractures: Including Joint Injuries, Churchill-Livingstone, and Edinburgh. ISBN: 0-443-10297-X.
14. King, H.M. & Bewes, P., (1987). Primary Surgery Volume 2 (Trauma), Oxford Medical Publications, Oxford. ISBN: 0-19-261 699-8.

COURSE TITLE: SURGERY SENIOR CLERKSHIP

Introduction

The clerkship expects the student to be an active member of the team he is assigned to and as such he is expected to attend all activities of that team including night calls, emergency and operating rooms. This mainly involves history taking, performing physical examinations, writing work-ups and participating in diagnostic and therapeutic exercises within his limited competences during patient care. The student is expected to develop cognitive, manipulative and attitudinal skills as part of his training in surgery.

Pre-requisites: Surgery Junior Clerkship

Course aim

1. Obtaining patient history, physical examinations, performing investigations
2. Admitting and discharging patients
3. Participating in outpatient clinics
4. Preparing the patient record, pre- and post-operative orders, progress notes, description of surgical procedures and discharge summaries.
5. Attending to rounds on inpatients and same-day surgery
6. Proper operating room procedures
7. On-call participation and managing surgical patients
8. Surgical knowledge: Demonstrate knowledge of applied basic sciences and surgical sciences and its
9. application to patient care
10. Interpersonal and Communication Skills: Must communicate well with patients, their families, peers and other health professionals caring for the same patient.
11. Preventive and Rehabilitative Practice: Demonstrate awareness of care beyond the curative care: showing ability to work within the healthcare system to provide optimal care.

Learning Outcomes/ Learning Objectives

On completion of the course the student should be able to:

1. Describe the fundamentals of applied basic sciences to the practice of clinical surgery
2. Describe the structure and function of the body under surgical diseases
3. Describe the manifestations of surgical disease and their pathophysiology on radiographs, laboratory findings.
4. Describe fundamentals of post-operative pain management.
5. Accurately present to, the health care team in the hospital and outpatient sites, the following with regards to the patient's condition: progress, results of laboratory investigations, and imaging studies.
6. To assure safe and compassionate care and discharge plan the student is expected to work collaboratively with the healthcare team serving the patient.
7. Demonstrate the ability to obtain a thorough and accurate medical and surgical history
8. Demonstrate the ability to perform a physical examination that allows formulation of a differential diagnosis
9. Provide a written report of the progress of a patient complete with interpretation of the laboratory results.
10. Perform the following procedures: venepuncture, insertion of nasogastric feeding tube, insertion of a urinary bladder catheter, intravenous line insertion, and suture of minor lacerations.
11. Practise universal infection control precautions when carrying out procedures.
12. Show respect to peers, patients and their families, other healthcare professionals.
13. Be sensitive to cultural diversity and their norms
14. Use sterile techniques when carrying our surgical procedures
15. Observe and discuss ethical considerations when engaging surgical patients
16. Evaluate patients presenting with surgical emergencies
17. Demonstrate ability to manage intravenous fluid and electrolyte resuscitation and management in a surgical patient.
18. Exhibit professional behaviour stands all the time

Course Content

1. Acute abdomen
2. GI bleeding
3. Bowel obstruction
4. Breast diseases module
5. Hepato-biliary and pancreatic surgical diseases
6. Endocrine surgical pathology
7. Cardiac and thoracic surgical pathology
8. Vascular disease (carotid, aortic, and peripheral vascular system)
9. Paediatric surgery

10. Trauma, burns, surgical critical care
11. Plastic and reconstruction surgery

Teaching / Training Methods and hours

40 hours / week x 8 weeks = 320 hours

Clinical rotations
Bedside teaching
Lectures
Tutorials
Seminars
Web / ICT learning

Assessment

The criteria for assessment is knowledge of applied basic sciences and surgical sciences, clinical competence, and professionalism and ethics. Failure in clinical competence assessment will mean that the student has failed the course. Reliable and appropriate assessment methods will be used reflecting the learning the learning outcomes/learning objectives of the course.

Continuous assessment -	40%
Ward Attendances	
Portfolio	
Log Book	
Assignments	
Clinical (Long and Short Cases)	
OSCE	
Case Write up	
Final Examination -	60%
OSCE	
Long and Short Cases	
Written Papers	
MCQ	
EMG	
SBA	
Viva Voce	

Recommended Textbooks

15. Williams NO, O'Connel PR, McCaskie. (Editors, 2018). Bailey and Love's Short Practice of Surgery (27th Edition). CRTC Press.ISBN.-13:978-1498796507, ISBN-10:1498796508.
    Journals and Website to be advised by the lecturer
16. Glynn M, Drake W, (Editors, 2017). Hutchinson's Clinical Methods: An integrated approach to clinical practice (24th Edition). Elsevier. ISBN-13:978-0702067396, ISBN-10: 0702067393.
17. Bickley L (2008). Bates's Guide to Physical Examination and History taking (12th Edition). Lippincott Williams and Wilkins. ISBN-13: 9781469893419, ISBN-10:978-14698993419.
18. Lumley JS, D'Cruz AK, Hoballah Scott-Connor CE (2016). Hamilton Bailey's Demonstration of Physical Signs in Clinical Surgery (19th Edition). CRC Press.ISBN-13:978-10:1444169181.

(3) Course title: Obstetrics& Gynaecology and Reproductive Health

Credit hours: 28

Contact hours: 120

Practicals/Clinical Rounds: 900

Semesters for the course to be taught in:

X (Credit hours: 14, Contact hours: 90, Clinical Rounds: 360),

XI (Credit hours: 6, Contact hours: 30, Clinical Rounds: 180),

SXII (Credit hours: 8, Clinical Rounds: 360).

9.42.1. Introduction

The Obstetrics and Gynaecology (OBG XXX) course is the Junior Obstetrics and Gynaecology clerkship that introduces the student to the discipline of Obstetrics and Gynaecology. The discipline is concerned with the health of a pregnant woman and the general well-being of a woman. A pregnant woman requires special heath care both for herself and the pregnancy.

9.42.2. Course Aim

To provide a comprehensive understanding of issues related to pregnancy: pre-conception, conception, pregnancy, onset of labour, and puerperium period. The course also introduces the student to the complex interactions of social, cultural and physiological processes that female undergo from puberty to menopause and after.

9.42.3. Learning Outcomes/Course Objectives

By the end of this clerkship the student should have acquired the expected knowledge, skills and attitudes to practise obstetrics and gynaecology at the house officer, general practitioner and readiness to commence specialist training in obstetrics and gynaecology.

9.42.3.1. Knowledge Objectives

1. Describe the anatomical, physiological, and pathological basis of common obstetric and gynaecological conditions
2. Understand the theories of onset of labour and recognize symptoms and signs of onset of labour
3. Recognize symptoms and signs of common obstetric and gynaecological conditions.
4. Analyse symptoms and signs of obstetric gynaecological processes to arrive at a diagnosis.
5. Identify and interpret laboratory and other investigations required to make a diagnosis and/or monitor clinical progress of such patients.
6. To understand basic Knowledge of ultrasound, use in Obstetrics and Gynaecology

9.42.3.2. Skills Objectives

1. Obtain a detailed history from an Obstetric and Gynaecological patient
2. Identify physical signs in a patient with emphasis on correct procedure
3. Perform obstetric examination, including palpation and auscultation
4. Perform speculum examination under supervision
5. Conduct normal deliveries according to guidelines (Clerk sheets) under supervision
6. Draw a partogram to monitor progress of labour and identify problems in the progress
7. Perform vaginal examination under supervision for Obstetric and Gynaecological patient
8. Counselling female patient regarding contraception
9. Perform basic ultrasound scanning
10. Attitude objectives
11. Awareness of medical ethics in handling of female patients

12. Deal with female patients regarding intimate details of their lives in a sensitive and respectful manner
13. Deal with aspects of morbidity, maternal death and death of new-borns
14. Awareness of professional limitations.
15. Respect for other health professionals, both junior and senior
16. Should have good personal predisposition
17. Manage prolonged labour
18. Manage amniotic fluid disorders
19. Understand Rh immunisation
20. Diagnosing and managing bleeding in late pregnancy
21. Manage premature labour with PROM

9.42.4.1. Course Content – Semester IX:

Week	Content	Content output
Week 1	History taking in Obstetrics and Gynaecology	○ Etiquette in taking a history ○ Dating the pregnancy ○ Taking the history ○ Identifying risk ○ Examination ○ History template
Week 2	Placental Anatomy and Physiology	○ Overview of the delivered placenta. ○ Placental Development ○ Placental Abnormalities ○ Maternal-fetal relationship ○ Placental transport. ○ Placental Endocrinology ○ Sex differences in placental function
Week 3	Maternal physiology	○ Gestational weight Gain during pregnancy ○ Cardiovascular Changes in pregnancy ○ Hematologic Changes. ○ Respiratory Changes ○ Urinary changes ○ Endocrine Changes ○ Immunological Changes ○ Breast Changes ○ Skin Changes
Week 4	Preconception and prenatal care.	○ Definition and Goal of Care ○ Components of preconception care ○ Preconception Health Counselling ○ Prenatal care (ANC)
Week 5	Genetic Counseling and Genetics Screening	○ Chromosomal Abnormalities (trisomy21,18,13, monosomy X, Klinefelter Syndrome)
Week 6	Basics of Obstetrics Ultrasound.	○ Indications for Ultrasound use in Obstetrics and Gynaecology ○ First Trimester Ultrasound ○ Second trimester Ultrasound

		○ Third trimester Ultrasound ○ Antenatal fetal testing ○ Assessment of fetal lung maturation
Week 7	Normal Labor and Delivery	○ Labour Definition and Physiology ○ Mechanics of normal labour (power, passage & passenger). ○ Cardinal Movements of Labour ○ Normal progress of labour and use of partograph ○ Active management of the third stage of labour ○ Episiotomy ○ Essential new-born care
Week 8	Abnormal Labor	○ Abnormalities of Latent Phase ○ Abnormalities of Active phase ○ Abnormalities of second stage ○ Abnormalities of third stage ○ Precipitous Labor
Week 9	Malpositions and malpresentations	○ Brow presentation ○ Face presentation ○ Shoulder presentation ○ Shoulder dystocia ○ Breech presentation
Week 10	Induction and Augmentation of Labor	○ Definitions ○ Indications and contraindications ○ Prerequisites for induction ○ Methods of induction ○ Complications of induction
Week 11	Intrapartum fetal evaluation.	○ Types of Fetal heart rate monitoring ○ Normal and abnormal fetal heart rate patterns ○ Management of abnormal fetal heart rate patterns
Week 12	Operative vaginal Delivery	○ Classification ○ Prerequisites ○ Indications and contraindications ○ Techniques for operative vaginal delivery ○ Complications of operative vaginal delivery
Week 13	Post-partum Hemorrhage	○ Definition ○ Causes and risk factors ○ Management ○ Complications
Week 14	Obstetrics Anesthesia	○ Pain pathway ○ Anaesthesia for labour ○ Anaesthesia for instrumental delivery and perineal tears ○ Anaesthesia for Caesarean section

Week 15	Cesarean Section.	○ History of Caesarean Section ○ Indications for Caesarean section ○ Preparation for Caesarean section ○ Techniques of Caesarean section ○ Complications of Caesarean section ○ Care after caesarean section
Week 16	Trial of Labor after Cesarean Section (TOLAC)	○ Candidates for a Trial of Labor After Caesarean ○ Success Rates for a Trial of Labor After Caesarean ○ Risks associated with TOLAC

9.42.4.2. Master time Table-Semester IX:

Week	08: 00 – 10:00 AM	11:00 AM – 01:00 PM	02:00 – 05 :00 PM
Week 1	Interactive Lecture	Clinical round	Duty placements
Week 2	Interactive Lecture	Clinical round	Duty placements
Week 3	Interactive Lecture	Clinical round	Duty placements
Week 4	Interactive Lecture	Clinical round	Duty placements
Week 5	Interactive Lecture	Clinical round	Duty placements
Week 6	Interactive Lecture	Clinical round	Duty placements
Week 7	Interactive Lecture	Clinical round	Duty placements
Week 8	Interactive Lecture	Clinical round	Duty placements
Week 9	Interactive Lecture	Clinical round	Duty placements
Week 10	Interactive Lecture	Clinical round	Duty placements
Week 11	Interactive Lecture	Clinical round	Duty placements
Week 12	Interactive Lecture	Clinical round	Duty placements
Week 13	Interactive Lecture	Clinical round	Duty placements
Week 14	Interactive Lecture	Clinical round	Duty placements
Week 15	Interactive Lecture	Clinical round	Duty placements
Week 16	Interactive Lecture	Clinical round	Duty placements

9.42.5.1 Course content – Semester X:

Week	Lecture	Content output
Week 1	Postpartum Care	○ Postpartum involution ○ Health maintenance ○ Postpartum family planning
	Puerperal sepsis	○ Definition ○ Risk factors ○ Clinical presentation ○ Diagnosis ○ Management
Week 2	Miscarriage.	○ Definition ○ Clinical Classification ○ Risk factors ○ Clinical presentation ○ Diagnosis ○ Management
	Ectopic Pregnancy.	○ Definition ○ Risk factors ○ Clinical presentation ○ Diagnosis ○ Management
Week 3	Molar pregnancy	○ Classification ○ Epidemiology and risk factors ○ Diagnosis ○ Management ○ Post molar surveillance ○ GTN
	Hyperemesis Gravidarum	○ Definition ○ Risk factors ○ Clinical presentation ○ Diagnosis ○ Management
Week 4	Antepartum Hemorrhage	○ Physiologic adaptation to haemorrhage ○ Definitions ○ Classifications ○ Causes and risk factors ○ Management ○ Complications
	Premature rupture of membranes	○ Fetal membranes anatomy and physiology ○ Definition of PROM ○ Aetiology and risk factors of PROM ○ Diagnosis of PROM ○ Management of PROM ○ Complications of PROM
Week 5	Preterm Labor and Birth	○ Definition ○ Clinical risk factors for preterm birth ○ Pathophysiology of spontaneous preterm

		birth ○ Diagnosis of preterm birth ○ Management of preterm birth ○ Prevention of preterm birth
	Cervical insufficiency	○ Definition ○ Risk factors for Cervical insufficiency ○ Diagnosis ○ Management
Week 6	Amniotic fluid disorders	○ Amniotic fluid formation and removal ○ Ultrasound assessment of amniotic fluid volume ○ Oligohydramnios, (diagnosis, risk factors, management and complications) ○ Polyhydramnios, (diagnosis, risk factors, management and complications)
	Prolonged and post term pregnancy	○ Definition ○ Incidence ○ Diagnosis ○ Management ○ complications
Week 7	Hypertensive disorders in pregnancy	○ Preeclampsia • Definition • Risk factors • Pathophysiology • Diagnosis • Management ○ Eclampsia • Definition • Diagnosis • Management ○ Chronic Hypertension and superimposed preeclampsia • Definition • Diagnosis • Management
	Multiple pregnancy	○ Diagnosis of Multiple pregnancy ○ Complications unique to Multiple gestations ○ Antepartum management of Multiple gestation ○ Timing of delivery in Multiple gestation ○ Mode of delivery in multiple gestation
Week 8	Intrauterine growth restriction	○ Definition and pattern of fetal growth restriction ○ Etiology of IUGR ○ Maternal and fetal manifestations of IUGR ○ Diagnostic tool for IUGR ○ Screening and prevention of IUGR ○ Treatment of IUGR

	Recurrent pregnancy loss and stillbirth.	○ Definitions ○ Common causes of early pregnancy loss ○ Common causes of late pregnancy loss (stillbirth) ○ Management of recurrent early pregnancy loss ○ Management of subsequent pregnancies after stillbirth
Week 9	Red cell Alloimmunization	○ Rhesus Alloimmunization and fetal/neonatal hemolytic disease of the newborn ○ Prevention of RhD in the fetus and newborn ○ Diagnosis of RhD Alloimmunization ○ Management of RhD Alloimmunization
	Gynaecological infections	○ Pelvic inflammatory disease ○ Bacterial vaginosis ○ Vaginal candidiasis ○ Gonorrhea
Week 10	Contraception and sterilization	○ Definition of family planning ○ Medical eligibility for contraceptives ○ Barrier Methods ○ Short acting family planning ○ Long acting reversible methods ○ Permanent family planning methods
	Maternal perinatal infection	○ Syphilis ○ Hepatitis B ○ HIV and PMTCT ○ Malaria
Week 11	Diabetes Mellitus	○ Maternal classification and risk factors ○ Management of Gestational diabetes in pregnancy ○ Management of presentational diabetes in pregnancy
	Hematologic complications in pregnancy	○ Anemia in pregnancy ○ Pathophysiology of thrombosis of pregnancy ○ Gestational thrombocytopenia ○ Blood transfusion
Week 12	Epilepsy in pregnancy.	○ Teratogenic effects of antiepileptic drugs ○ Preconception counselling for women with Epilepsy ○ Care of epileptic woman during pregnancy
	Menstrual Cycle	○ Regulation of the menstrual cycle ○ Normal Mensural cycle ○ Abnormalities of the menstrual cycle
Week 13	Amenorrhea	○ Definition ○ Classification ○ Causes ○ Diagnosis ○ Management

	Abnormal uterine bleeding	○ PALM-COIEN classification of AUB ○ Clinical presentation ○ Diagnosis ○ Management
Week 14	Pediatric Gynaecology	○ Normal Puberty ○ Abnormal puberty ○ Evaluation and management of abnormal puberty
	Pelvic mass	○ Uterine fibroids • Classification • Clinical presentation • Diagnosis • Management • Complications ○ Adenomyosis ○ Tubo-ovarian Abscess ○ Benign tumours of the ovary
Week 15	Endometriosis	○ Aetiology and risk factors ○ Classification ○ Clinical presentation ○ Diagnosis ○ Management
	Pelvic organ prolapse.	○ Classification ○ Risk factors ○ Clinical presentation ○ Diagnosis ○ Management
Week 16	Obstetric Fistula.	○ Definition ○ Risk factors ○ Classification ○ Diagnosis ○ Management ○ Prevention
	Reproductive Health Indicators	○ Maternal Mortality ○ Perinatal Mortality ○ Unmet need for Family planning ○ Total fertility rate. ○ Contraceptive prevalence ○ Teenage Pregnancy

9.42.5.2 Master Time Table- Semester X:

Week	08: 00 – 10:00 AM	11:00 AM – 01:00 PM	02:00 – 05 :00 PM
Week 1	Interactive Lecture	Clinical round	Interactive Lecture

Week 2	Interactive Lecture	Clinical round	Interactive Lecture
Week 3	Interactive Lecture	Clinical round	Interactive Lecture
Week 4	Interactive Lecture	Clinical round	Interactive Lecture
Week 5	Interactive Lecture	Clinical round	Interactive Lecture
Week 6	Interactive Lecture	Clinical round	Interactive Lecture
Week 7	Interactive Lecture	Clinical round	Interactive Lecture
Week 8	Interactive Lecture	Clinical round	Interactive Lecture
Week 9	Interactive Lecture	Clinical round	Interactive Lecture
Week 10	Interactive Lecture	Clinical round	Interactive Lecture
Week 11	Interactive Lecture	Clinical round	Interactive Lecture
Week 12	Interactive Lecture	Clinical round	Interactive Lecture
Week 13	Interactive Lecture	Clinical round	Interactive Lecture
Week 14	Interactive Lecture	Clinical round	Interactive Lecture
Week 15	Interactive Lecture	Clinical round	Interactive Lecture
Week 16	Interactive Lecture	Clinical round	Interactive Lecture

9.43. COURSE TITLE: OBSTETRICS AND GYNAECOLOGY SENIOR CLERKSHIP
Course Code: OBS XXX
Contact Hours: 320
Credit Hours: 4
Level: Year 6

9.43.1. Introduction
The obstetrics component of the course is to help students in developing an understanding of caring for patients with pregnancy, An appreciation of available local resources for this service and drivers of the high maternal and perinatal mortality. On the other hand, the gynaecology component deals with issues of family planning, contraception, and common gynaecology problems.

9.43.2. Pre-requisites: Obstetrics and Gynaecology Core Clerkship Course

9.43.3. Aims:
To impart the student with knowledge, skills and attitudes in obstetrics and gynaecology building on these areas:
1. Prenatal care: diagnosis and management of a pregnant woman

2. Labour and delivery: Managing labour and post-partum care
3. Gynaecology and reproductive health: diagnosis and treatment of common gynaecological problems and reproductive Health problems.

9.43.4.1. Course content – Semester XI:

Week	Seminar	Seminar Output
Week 1	Trauma and related Surgery in pregnancy	○ Effects of anatomic and physiologic changes of pregnancy in relation to trauma ○ Blunt trauma ○ Pathophysiology of fetal loss resulting from maternal trauma ○ Management consideration
Week 2	Drugs and environmental Agents in pregnancy and Lactation.	○ Basic principles of Teratology ○ Medical drugs use ○ Drugs of Abuse ○ Drugs in breast Milk
Week 3	Heart Disease	○ Diagnosis and Evaluation of Heart Disease in pregnancy ○ General care of Cardiac disease in pregnancy
Week 4	Respiratory Diseases	○ Tuberculosis ○ Bronchial Asthma
Week 5	Renal Diseases	○ Altered renal physiology in pregnancy ○ Urinary tract infection ○ Pyelonephritis
Week 6	Thyroid and parathyroid disease	○ Hypothyroidism ○ Hyperthyroidism
Week 7	Polycystic ovarian syndrome.	○ Definition ○ Aetiology ○ Diagnosis ○ Management
Week 8	Anatomic disorders and intersex	○ Disorders of sex development ○ Mullerian Anomalies ○ Vaginal septum ○ Imperforated hymen
Week 9	Evaluation and treatment of infertile couples	○ Definition of infertility ○ Classification of infertility ○ Causes of infertility ○ Evaluation of male infertility ○ Evaluation of female infertility ○ Treatment of male infertility ○ Treatment of female infertility
Week 10	Mental Health and Behavioral disorders in pregnancy	○ Postpartum Psychosis ○ Substance Abuse • Alcohol • Smoking • Caffeine

Week 11	Menopausal transition	○ Definition ○ Clinical manifestation ○ Diagnosis ○ Management
Week 12	Cervical Cancer	○ Incidence and risk factors ○ Classification ○ Diagnosis ○ Management ○ Prevention
Week 13	Endometrial Cancer	○ Incidence and risk factors ○ Classification ○ Diagnosis ○ Management ○ Prevention
Week 14	Ovarian Cancer	○ Incidence and risk factors ○ Classification ○ Diagnosis ○ Management ○ Prevention
Week 15	Vulvar Cancer	○ Incidence and risk factors ○ Classification ○ Diagnosis ○ Management
Week 16	Vaginal Cancer	○ Incidence and risk factors ○ Classification ○ Diagnosis ○ Management

9.43.4.2. Master time Table – Semester XI:

Week	08: 00 – 10:00 AM	11:00 AM – 01:00 PM	02:00 – 05 :00 PM
Week 1	Seminar presentation	Clinical round	Duty placements
Week 2	Seminar presentation	Clinical round	Duty placements
Week 3	Seminar presentation	Clinical round	Duty placements
Week 4	Seminar presentation	Clinical round	Duty placements
Week 5	Seminar presentation	Clinical round	Duty placements
Week 6	Seminar presentation	Clinical round	Duty placements
Week 7	Seminar presentation	Clinical round	Duty placements
Week 8	Seminar presentation	Clinical round	Duty placements

Week 9	Seminar presentation	Clinical round	Duty placements
Week 10	Seminar presentation	Clinical round	Duty placements
Week 11	Seminar presentation	Clinical round	Duty placements
Week 12	Seminar presentation	Clinical round	Duty placements
Week 13	Seminar presentation	Clinical round	Duty placements
Week 14	Seminar presentation	Clinical round	Duty placements
Week 15	Seminar presentation	Clinical round	Duty placements
Week 16	Seminar presentation	Clinical round	Duty placements

9.43.5.1 Course contents – Semester XII:

Week	Practical Skills Lab	Skills lab output
Week 1	Preoperative preparation	○ Consent for surgery ○ Cannulation ○ Catheterization
Week 2	Partograph	○ Definition ○ Use ○ Haw to draw
Week 3	Normal Delivery	○ Fetal skull anatomy ○ Maternal pelvic anatomy ○ How to conduct normal delivery
Week 4	Episiotomy	○ Instruments & sutures ○ Types ○ Indications ○ techniques
Week 5	Instrumental Delivery	○ Instruments ○ Types ○ Indications ○ Techniques for Vacuum Extraction ○ Techniques for forceps delivery
Week 6	Caesarean Section	○ Instruments and sutures ○ Preparation for CS ○ Techniques
Week 7	Neonatal resuscitation	○ APGAR score ○ Techniques of resuscitation

Week 8	Administration of Magnesium Sulfate and Calcium Gluconate	○ How to prepare 20% out of 50% MgSo4 ○ How to give loading and maintenance dose of MgSo4? ○ How to give Calcium Gluconate
Week 9	Manual Vacuum Aspiration (MVA).	○ Instruments ○ Indications ○ Techniques ○ Complications
Week 10	Dilatation and Curettage (D&C)	○ Instruments ○ Indications ○ Techniques ○ Complications
Week 11	Cervical Cancer screening	○ Types of screening ○ When to screen ○ How to screen
Week 12	Insertion and removal of implanon	○ Types of implanon ○ Instruments for insertion ○ How to insert ○ How to remove
Week 13	Insertion and removal of IUCD	○ Instruments for insertion ○ Techniques for insertion ○ Techniques for removal
Week 14	Injection of DMPA-SC	○ Techniques for injection

9.43.5.2. Master Time Table- Semester XII:

Week	08: 00 – 10:00 AM	11:00 AM – 01:00 PM	02:00 – 05 :00 PM
Week 1	Practical skills Lab	Clinical round	Duty placements
Week 2	Practical skills Lab	Clinical round	Duty placements
Week 3	Practical skills Lab	Clinical round	Duty placements
Week 4	Practical skills Lab	Clinical round	Duty placements
Week 5	Practical skills Lab	Clinical round	Duty placements
Week 6	Practical skills Lab	Clinical round	Duty placements
Week 7	Practical skills Lab	Clinical round	Duty placements
Week 8	Practical skills Lab	Clinical round	Duty placements
Week 9	Practical skills Lab	Clinical round	Duty placements

Week 10	Practical skills Lab	Clinical round	Duty placements
Week 11	Practical skills Lab	Clinical round	Duty placements
Week 12	Practical skills Lab	Clinical round	Duty placements
Week 13	Practical skills Lab	Clinical round	Duty placements
Week 14	Practical skills Lab	Clinical round	Duty placements
Week 15	Practical skills Lab	Clinical round	Duty placements
Week 16	Practical skills Lab	Clinical round	Duty placements

9.43.6. Teaching Methods Contact and Credit hours:

Method	Number	Contact Hours	Credit Hours
Interactive Lectures	64	128	8.5
Clinical Rounds	64	192	4.3
Seminar presentations	16	48	1.1
Practical skills lab	16	48	1.1
Duty placements	32	96	2.1
Total contacts and credit hours		**512**	**17.1**

9.43.7. Assessment Methods

S/N	Assessment Methods	Remarks
1.	**Continuous Assessment**	**40%**
	1.1 Assignments (Write-ups)	10%
	1.2 Written test	15%
	1.3 Practical	10%
	1.4 Attendants and Punctuality	5%
2.	**Summative Assessment**	**60%**
	2.1 Paper I (SBA)	20%

	2.2 Paper II (Essays and short notes)	20%
	2.3 Clinical long case	15%
	2.4 Objective structured clinical evaluation (OSCE)	5%

9.43.8. References:

1. Stanley G. Clayton, Ash Monga (2006). **Gynaecology by Ten Teachers.** (Latest Edition). Hodder Arnold, London. ISBN-13: 978-0340816622.
2. Stuart Campbell, Christoph Lees (2000) **Obstetrics by Ten Teachers** (latest edition). Hodder Arnold, London. ISBN-13: 978-0340719862.
3. Gabbe. Neiby. Simpson. Landon. Galan. Juaniaux. Driscoll. Bergella. Grobman. **Obstetrics, Normal and problem pregnancies** 8th Edition (2018).
4. Hoffman. Schorge. Schaffer. Halvorson. Bradshaw. Cunningham. **Williams Gynaecology**, 4th Edition.
5. Cunningham, Leveno, Bloom, Dashe, Hoffman, Casy and Spong, **Williams Obstetrics**, 25th Edition.
6. E. Malcolm Symonds, Ian M. Symonds (2006). **Essential Obstetrics and Gynaecology** (latest Edition). Churchill Livingstone, Edinburgh. ISBN 0443071470.191.
7. Jeremy Oats, Suzanne Abraham (2005). Llewellyn-Jones **Fundamentals of Obstetrics and Gynaecology** (latest Edition) Elsevier Mosby, Oxford. ISBN 0723433305.
8. Hart, D. M. (2000) **Gynaecology illustrated** (5th Edition). Churchill Livingstone, Edinburgh.
9. Kevin P Hanretty. (2003) **Obstetrics Illustrated** (6th Edition). Churchill Livingstone, Edinburgh. 978-0-443-07267-3.
10. Robert W. Shaw, W. Patrick Souter and Stuart L Stanton (2000). **Gynaecology.** Churchill Livingstone, Edinburgh. ISBN: 0443070296.
11. S. Arulkumaran. (2006). **Emergencies in Obstetrics and Gynaecology** (1st Edition). OUP, Oxford ISBN-13: 978-0198567301.

(4) Course title: Paediatrics and Child Health

Credit hours: 26
Contact hours: 90
Practical/Clinical Rounds: 900
Semesters for the courses to be taught:
X (Credit hours: 12, Contact hours: 60, Clinical Rounds: 360),
XI (Credit hours: 6, Contact hours: 30, Clinical Rounds: 180),
XII (Credit hours: 8, Clinical Rounds: 360).

Introduction

This course is the Pediatrics and Child Health Junior clerkship which introduces the student to the discipline of pediatrics which is concerned with the health of infants, children and adolescents; their growth and development; and their opportunities to achieve full potential as adults. The young are often among the most vulnerable or disadvantaged in society, and thus their needs require special attention. As physicians who voluntarily assume a responsibility for children's health from conception to maturity pediatricians are not only concerned with organ systems and biological processes but with social and environmental factors which impact on the health and well-being of children and their families.

Course Aim

The aim of the course is to provide a basic understanding of the concepts, principles and practice(s) of Pediatrics and Child Health.

Learning Outcomes/Course Objectives

At the end of this course, the student shall be able to:

1. Explain the concept and significance of Paediatrics and Child Health in order to highlight awareness that the health problems of children differ from those of adults and that the child's response to illness and stress varies with age.
2. Demonstrate a systematic approach to examination of the paediatric patient through observation, history taking and physical examination.
3. Recognise the normal patterns and milestones of growth and development of children at each age and deviations from the norm so that underlying disorders may be promptly identified and given appropriate attention.
4. Recognize that appropriate nutrition in children is necessary to prevent illnesses and to develop physical and mental potential.
5. Recognize that prevention in the health care of infants, children, and adolescents is at the core of the field of paediatrics.
6. Relate the pathophysiology of body fluids and fluid therapy to the management of specific pediatric illnesses.
7. Evaluate the acutely ill child in order to institute appropriate treatment.
8. To correlate signs and symptoms with diseases processes occurring in different body systems.
9. Recognise signs and symptoms of common infectious diseases.
10. Judge when to use antimicrobial agents and analgesics.

Course Content

1. The Discipline of Paediatrics and Child Health
2. Overview of Paediatrics.
3. Ethics in Paediatric Care.
4. Cultural Issues in Paediatric Care.
5. Child Health in the Developing World.
6. The Well Child.
7. Advocacy for child health.

Approach to Examination of the Paediatric Patient

1. The Paediatric interview.
2. Observation.
3. Physical examination of systems (e.g. CNS, RS, GIT, CVS, MSS).
4. Examination of the new born.

5. The adolescent patient.

The Assessment of Normal and Abnormal Development and the Evaluation of Growth

1. Four general characteristics of normal development.
2. Four major functional categories of developmental assessment.
3. Evaluation of development.
4. Developmental abnormalities.
5. Growth and development during the first five years of life.
6. The growth chart.
7. Evaluation of short and long stature; failure to thrive.

Nutrition and Nutritional disorders in the developing child

Age related nutritional requirements

The feeding of infants and children

1. Breast feeding;
2. Formula feeding.
3. Deficiency states and food insecurity, hunger and under nutrition.
4. Vitamin deficiencies and excesses.

Preventive Paediatrics

1. Immunisation (Vaccine-based).
2. Screening (congenital hypothyroidism).
3. Anticipatory guidance.

Foetus and new born infant

1. Normal new born infant.
2. Delivery room management;
3. Transition;
4. Routine Care.
5. Respiratory distress in the new born: aetiology, clinical features, diagnosis, management
6. Effect of maternal medications on the foetus and suckling infant: classification, indications, contraindications

Abnormal new born infant

1. Resuscitation.
2. Conditions /diseases
3. Prematurity
4. SGA, LGA
5. Sepsis
6. HIE
7. Jaundice
8. Common congenital malformations, genetic and chromosomal abnormalities.

The Acutely Ill Child

1. Paediatric emergencies and resuscitation.
2. Shock.
3. Respiratory distress and failure.
4. Mechanical ventilation renal stabilization.
5. Nutritional Stabilization.
6. Neurologic Stabilization.
7. Acute care of the multiple trauma victim.

The child with a disorder of fluid and electrolyte homeostasis

1. Summary of physiologic principles
2. Normal sources of water and electrolyte loss;
3. Normal body defences against water and salt losses.
4. Dehydration
5. Characteristics of dehydration
6. Treatment of dehydration
7. Prevention of dehydration
8. Electrolyte and acid-base disorders

Treatment of specific disorders

1. Acute diarrhoea and oral rehydration
2. Diarrhoea in chronically malnourished children
3. Pyloric stenosis
4. Peri-operative fluids

Environmental Emergencies

1. Poisoning General
2. Specific poisonings/ingestions
3. Hydrocarbons
4. Organophosphates
5. Theophylline
6. Anticholinergic substances
7. Carbon monoxide
8. Acids and alkali
9. Iron plants

Allergy and related disorders

1 Allergy and the immunologic basis of atopic
2 Disease
3 Diagnosis of allergic disease
4 Principles of treatment of allergic disease
5 Allergic rhinitis
6 Childhood asthma
7 Atopic dermatitis (atopic eczema)
8 Urticaria and angioedema
9 Anaphylaxis serum sickness
10 Adverse reactions to drugs, insect allergy, ocular allergies
11 Adverse reactions to foods

Infectious diseases

1. Malaria
2. HIV and AIDS (Aetiology, Clinical staging)
3. Diagnosis of opportunistic infections
4. TB
5. Fever
6. Sepsis and shock
7. Infections in immuno-compromised persons
8. Nosocomial infection
9. Common childhood exanthematous illnesses
   Measles
   Rubella
   Chickenpox
   Polio
10. Mumps and whooping cough
11. Typhoid fever
12. Diphtheria
13. Parasitic disorders
    Protozoal infections
        Amoebiasis
        Giardiasis
        Malaria
        Leishmaniasis
        Filariasis
    Nematodes
        Round worms
        Hook worms
        Thread worms
        Pin worm

Ascariasis
Trichuriasis

Cestodes

Taeniasis (Taenia solium and Taenia saginata)
Echinococus granulosis and Echinoscocus multilocularis
(hydatid cyst)
Diphyllobothrium latum (fish or broad tapeworm)
Spirometra spp. plerocoid tapeworm larvae (sparganosis)
Cysticercosis (T.solium)
Hymernolepis nana and Hymeolepis diminuta (dwarf tapeworm and rat tapeworm)

Trematodes

Blood flukes (schistomiasis, bilharziasis)
Liver flukes (fachioliasis, clonorchiasis, opisthorchiasis)
Intestinal flukes (fasciolopsiasis)
Lung flukes (paragonimiasis)

Gastrointestinal disorders

1. Common GIT symptoms: vomiting, constipation, rectal bleeding
2. Diarrhoea (Acute, Persistent, Chronic)
3. Acute diarrhoea: assessment of dehydration, management, oral rehydration therapy, nutritional management
4. Jaundice
5. Persistent diarrhoea
6. Acute and chronic abdominal pain
7. Malabsorption
8. Gastrointestinal bleeding
9. Constipation (Causes and management of constipation)
    - Hirschprung's disease
    - Encopresis
8. Inflammatory bowel disease
9. Liver disease
10. Others:
    - Gastro-oesophageal reflux (GOR)
    - Cholecystitis
    - Pancreatitis
    - Pyloric stenosis
    - Parasitic infestation

Respiratory Disorders

1. General signs and symptoms
2. Stridor
3. Respiratory failure
4. Cough
5. Wheezing
6. Cyanosis
7. Hemoptysis
8. Apnoea
9. Chest pain

Upper Respiratory tract infection

1. Upper airway (common cold, acute streptococcal pharyngitis, otitis media, croup
2. Lower airway (pneumonias: epidemiology, aetiology, clinical features, diagnosis, management, prevention
3. Parenchymal
4. Asthma
5. Cystic fibrosis

Cardiovascular disorders

1. General aspects
2. Congestive heart failure: causes, diagnosis and management
3. Cyanotic congenital heart disease
4. Acyanotic congenital heart disease
5. Infectious and post infectious diseases (RHD)
6. Cardiomyopathies
7. Rate and rhythm disorders
8. Infective endocarditis

Disorders of the blood/neoplasms

Haemato-oncology

1. Haemolytic anaemia in children
2. Acute leukaemia and lymphomas
3. Solid tumours in children

The child with suspect renal disease

1. General
2. Normal function
3. Proteinuria
4. Haematuria
5. Dysuria
6. Acute renal failure
7. Nephrotic syndrome
8. Incontinence

Acquired Renal Conditions

1. Infection of the urinary tract
2. Acute glomerulonephritis
3. Nephrotic syndrome
4. IGA nephropathy
5. Haemolytic-uremic syndrome
6. Henoch-Schoenlein purpura

Other Renal Conditions

1. Renal Failure
2. Chronic renal failure
3. Hypertension, Renal stones
4. Renal tumours

CNS/Neurologic Disorders

1. Signs/symptoms of neurologic dysfunction
2. Headache
3. Altered level of consciousness
4. Ataxia
5. Movement disorders
6. Increased intracranial pressure
7. Weakness
8. Poliomyelitis
9. Myopathies
10. Macrocephaly and microcephaly
11. Hydrocephalus
12. Mental retardation
13. Cerebral palsy
14. TB meningitis
15. Pyogenic meningitis

Infection Meningitis

1. Encephalitis
2. Abscess

Seizures General

1. Febrile
2. Pyogenic meningitis
3. Neonatal
4. Infantile spasms
5. Absence epilepsies
6. Complex partial seizures
7. Status epilepticus

Peripheral nerve and muscle Guerin-Barre syndrome

1. Neuropathy
2. Muscle diseases

Endocrine conditions

1. Thyroid disorders: hypothyroidism, hyperthyroidism
2. Diabetes mellitus
3. Pituitary gland disorders
4. Adrenal gland disorders (CAH)
5. Insulin dependent diabetes mellitus

Genetics disorders

1. Genetics anomalies
2. Chromosomal disorders
3. Inborn errors of metabolism

Paediatric psychiatry

1. Encopresis and enuresis
2. Mental retardation
3. Autism spectrum disorders
4. Attention deficit Disorders
5. Conduct Disorder
6. Alcohol and Substance abuse in adolescence
7. Child abuse
8. Principles of child and adolescence psychopharmacology

Topics to be covered as Seminars and Tutorials

1. Integrated management of Childhood Illness (IMCI)
2. Malnutrition
3. Immunization (EPI)
4. Malaria
5. HIV & AIDS
6. Tuberculosis
7. Asthma
8. Infective endocarditis
9. Fulminant hepatic failure
10. Sickle cell anaemia
11. Diabetic ketoacidosis (DKA)
12. Acute flaccid paralysis

Teaching Methods & Contact Hours

Lectures:	2 hours/week
Small Group Discussions:	2 hours/week
Bedside Teaching:	20 hours/week
Tutorials:	10 hours/week
Seminars:	1 hour/week

Assessment Methods

Assessment shall include assessment of knowledge, skills and attitudes:

Continuous Assessment-	**40%**
Evaluation of the log-book -	5%
Written exam-	15%.
Clinical examination: OSCE, long case,	20%
Final Examination -	**60%**
Written: Paper I- Essays and short answer questions -	20%.
Paper II - Multiple Choice questions –	10%
Clinical: OSCE -	25%.
Final oral exam-	5%.

Pass mark: 50% or better: the clinical component must be passed in order to pass the examination.

Recommended Text Books

1. Kliegman, Behrman, Jenson, Stanton 2008. Nelson Textbook of Pediatrics. 18th Edition. Publishers, Saunders, Elsevier.
2. Mclntosh N, Helms P, Smyth R, Logan S (2005). Forfar et al. Arneil's Textbook of Pediatrics. Publishers, Churchill, Livingstone, Elsevier.
3. Southall L, Coulter B, Ronald C, Nicholson S, Parke S.(2002) International Child.
4. Health care, A Practical Manual for Hospitals Worldwide, Child Advocacy International Publishers BMJ books 2002.
5. Swash M. (1195). Hutchinson's Clinical methods (20th Ed). WB Saunders Company Ltd; London.
6. Milner A.D., Hull D (2006) Hospital Paediatrics. 5th Edition. Publishers, Churchill Livingstone.
7. Stanfield P. Bwibo N. (2005) Child Health A manual for medical and Health Workers in Health Centres and Rural Hospitals. 3rd Edition. Publishers. AMREF.

   Integrated Management of Childhood Illness. Publishers. WHO, UNICEF

COURSE TITLE: PAEDIATRICS AND CHILD HEALTH SENIOR CLERKSHIP

Pre-requisites:

Paediatrics and Child Health Core Clerkship

Introduction:

Students will be exposed to outpatient and inpatient paediatrics services in the following sites: teaching hospital children wards, or district hospital paediatric centre and outreach paediatric services. Students will be expected to clerk patients, take full paediatric history, perform physical examinations, and formulate differential diagnoses and management plans. Students will be integrated into the ward team carting for the paediatric patient and be responsible for admitting patients, devise a management plan and continue managing the patient until discharged. They will be expected to also come up with a discharge plan. Students are expected to review online the disease conditions of their patients for purposes of learning more about the particular, any new treatment protocols that would be used to better manage the patient. They are encouraged to use textbooks, journals and electronic resources.

Course Aim

The general course aim is to prepare the student for their role, upon graduation, as a house officer and thereafter as a general practitioner taking care of children, and also those who wish to engage in postgraduate training:

1. Child growth and development:

Demonstrate the ability to monitor child development from infancy to adolescence.

2. Well infant/child care:

Able to care from neonatal through baby stage to child.

3. Prevention:

Be able to discuss disease prevention measures from infancy through to adolescence.

4. Common acute problems:

Demonstrate the ability to diagnose and manage these conditions in pediatric patients.

5. Infections:

Ability to recognize and diagnose common infectious problems in paediatric patients

6. Paediatric emergencies:

Recognise and stabilise paediatric patients with conditions that require emergency management, urgently refer for specialist management

7. Disabilities and chronic conditions: Ability to supervise the necessary ongoing management of paediatric patients in this category
8. Adolescent health: Able to manage adolescent health problems

Procedures:

Able to discuss indications and contraindications and counsel parents/guardians to perform diagnostic and therapeutic procedures in paediatric patients: lumbar puncture, intravenous lines, drawing blood for investigations etc.

Content:

1. Normal and abnormal growth and development
2. Wellness in an infant or child
3. Prevention of diseases: immunisation, nutrition, exercise, accident/injury prevention
4. Common acute problems: new born jaundice, asthma, abdominal pain, enuresis, constipation, strabismus, gait, problems, headache, limb pain, skin disorders, speech difficulties, hearing and vision problems, malformations
5. Infections: URTIs, otitis media, conjunctivitis, pneumonia, gastroenteritis, UTIs. Balanitis, vaginitis, impetigo, fever, HIV/AIDS, TB, malaria
6. Emergent problems: neonatal congenital defects, hypoglycaemia, severe jaundice, dehydration, convulsions, epiglottitis, meningitis, septicaemia, depression with suicidal ideation, head injury
7. Chronic and disability illnesses: malnutrition, epilepsy, diabetes, congenital defects, learning disabilities, intellectual and physical handicaps, AD (HD), mood disorders
8. Adolescents Health: eating disorders, acne, injury prevention, contraception, menstrual problems, mood disorders, sports injuries, relationships with family, friends, and partners.
9. Procedures: resuscitation, removal of wax from the ear canals, visual screening, ophthalmoscopy, removal of foreign body from eye, throat, nose or ear, immunisation injections, venepuncture, suturing, casting, bladder catheterisation, nasogastric feeding, intravenous infusion including scalp IV line, lumbar puncture, laryngoscopy and intubation

Learning Outcomes/Course Objectives:

On successful completion of the course the student should be able to:

1. Take a comprehensive history of the child and her/his family with regards to the health an illness of the infants, child and adolescents
2. Perform a comprehensive physical examination of infants, children and adolescents
3. Synthesise data from the history, physical examination and interpretation of laboratory results and formulate a problem-oriented approach to the patient's presenting problems.
4. Based on the understanding of normal growth and development of infants, children and adolescents apply this understanding to appreciate that impact of illness on the patient.
5. Apply knowledge of the basic sciences and epidemiology to the diagnosis and management of clinical paediatric problems.
6. Demonstrate how health problems in infants, children, and adolescents in terms are approached in terms of assessment, diagnosis and ultimately management.
7. Implement strategies for health supervision to prevent diseases, injury and screening in infants, children and adolescents
8. Demonstrate an understanding of the influence of family, community, and society on the child in health and disease.
9. Demonstrate the attitudes and professional behaviours appropriate for clinical and community paediatric practice

9.45.7. Teaching / Training Methods and Teaching Hours

40 hours/week x 8weeks-- 320 hours
Clinical rotations
Bedside teaching
Seminars
Tutorials
Lectures
Web/ICT learning

Assessment

Rationale:

The criteria for assessment is knowledge of applied basic sciences and surgical sciences, clinical competence, and professionalism and ethics. Failure in clinical competence assessment will mean that the student has failed the course. Reliable and appropriate assessment methods will be used reflecting the learning the learning outcomes/learning objectives of the course.

Continuous assessment -	**40%**
Final Examination (written and Clinical) -	**60%**
Written: Paper I- Essays and short answer questions -	20%.
Paper II - Multiple Choice questions –	10%
Clinical: OSCE -	25%.
Final oral exam-	5%.

Pass mark: 50% or better: the clinical component must be passed in order to pass the examination.

Recommended Text Books

1. Glynn M, Drake W. (Editors, 2017). Hutchinson's Clinical Methods: An integrated to approach to clinical practice (24th Edition). Elsevier, ISBN-13:978-0702067396, ISBN-10:0702067393.
2. Bickley L (2008). Bate's Guide to Physical Examination and History Taking (12th Edition). Lippincott Williams and Wilkins, ISBN-13:978-1469893419, ISBN-10:978-1469893419.
3. Duderstadt K, (2018). Pediatric Physical Examination: An illustrated Handbook (3rd Edition).Mosby .ISBN-13: 978-0323476508, ISBN-10: 9780323476508.
4. Hay WW, Levin MJ, Deterring M, Abzug M, (2018). Current Diagnosis and Treatment Paediatrics (24th Edition). McGraw-Hill Education/Medical.ISBN-13: 9781259862909.
5. Marcadante K, Kliegman R (2018). Nelson Essentials of Paediatrics (8th Edition).Elsevier. ISBN: 13:978-0323511452, ISBN-10:0323511457.

Journals and Websites to be advised by the lectures.

ANNEX REFERENCES USED TO DEVELOP THE CURRICULUM

1. Parson L, Childs B, Elzie P. Using Competency-based curriculum design to create a health professions education certificate program that meets the needs of students, administrators, faculty and patients. Health Professions Education .2018:4; 207-217.
2. Hartl A, Berberat P, Fischer MR et al. Development of the competency- based medical curriculum for the new Augsburg University Medical School. GMS Journal for Medical Education.2017.34:
3. Kiguli- Malwade, Olapade- Olaopa E O. Kiguli S et al. Competency- based medical education in two Sub-Saharan African Medical Schools. Advances in Medical Education in two Sub- Saharan African Medical Schools. https://www.dovepress.com/by
4. Taha MH. Medical Education in Sudan: A recommendation to adopt competency-based medical education curricula for improving practices (SudaniMEDs). Sudan Journal of Medical Sciences.2019; 14: 126- 131.
5. Zaini R G, Bin Abdulrahman KA, Al- Khotani AA. Et al Saudi Meds: a competence specification for Saudi medical graduates. Medical Teacher. 2011:33; 582-584.
6. Frank JR, Snell L, Sherbino J. The draft CanMEDS 2015 physician competency framework- series IV. Ottawa R Coll Physicians Surg Canada .2014.
7. Rose SH, Long TR. Accreditation Council for Graduate Medical Education (ACGME): Annual Anesthesiology Residency and Fellowship Program Review: a "report card" model for continuous improvement. BMC Medical Education. 2010:10; 13.
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Annex for National Medical Curriculum, Bachelor of Medicine and Bachelor of Surgery (MBBS)

Core curriculum

Courses with their contact hours, Practical/Clerkship, Credit hours and course distribution per Semester.

One credit hour=15 contact hours or 45 hours practical/Clerkship.

1. Semester I: General University requirements (Applied Basic Sciences & Other Courses)

S/N	Code	Course	Contact hours		Credit Hours
			Lectures	Practicals/ Tutorials	
1		Applied Mathematics	30	45	3
2		Applied Chemistry	75	135	8
3		Biology(Botany & Zoology)	60	90	6
4		Principles of Genetics	15	45	2
5		Behavioural Sciences (Psychology, Anthropology& Sociology)	30	0	2
6		Computer Sciences	15	45	2
7		Communication Skills for health workers	30	0	2
8		Applied Physics	45	135	6
9		**South Sudan Foundation**	60	0	4
		TOTAL	360	495	35

N.B: Practical Manuals to be developed for disciplines that have practicals.

2.0. Semesters II, III, IV (2nd Year) & V (3rd Yr) (Basic Medical Sciences)

S/N	Code	Course	Contact hours		Credit Hours
			Lectures	Practical	
1		Human Anatomy	75	630	19
2		Medical Biochemistry & Molecular Biology	210	450	24
3		Medical Physiology	210	405	23
4		Community Medicine	120	90	10
5		TOTAL	615	1,575	76

N.B: Practical Manuals to be developed for disciplines that have practicals.

Log book for Community Medicine placement will be developed.

2.1. Courses distribution: Semesters II, III, IV &V (2nd and 3rd Year)

S/N	Code	Course	SII	SIII	SIV	SV	Credit Hours
1		Human Anatomy	60-45	15-180	15-180	15-180	19
2		Medical Biochemistry & Molecular Biology	30-45	60-90	60-135	60-135	24
3		Medical Physiology	30-45	60-90	60-90	60-180	23
4		Community Medicine	60		60	60-90	10
5							76

Key: Eg. 60-45 means first number before dash=contact hours. Second number after dash=Practical hours.

3.0. Semesters VI (3rd yr.), VII &VIII(4th yr.)

S/N	Code	Course	Contact hours		Credit Hours
			Lectures	Practical	
1		Pathology	195	270	20
2		Microbiology and Immunology	165	270	18
3		Clinical Pharmacology	90	180	10
4		Community Medicine	75	90	7
5		Introduction to Medicine	30	270	8
6		Introduction to Surgery	30	270	8
7		Total	585	1,350	69

N.B: Practical Manuals to be developed for disciplines that have practical.

Log books for Clinical Pharmacology, Community Medicine, Medicine and Surgery placement will be developed.

3.1. Courses distribution, Semesters VI (3rd yr.), VII &VIII (4th yr)

S/N	Code	Course	VI	VII	VIII	Credit Hours
1		Pathology	60-90	75-90	75-90	20
2		Medical Microbiology& Immunology	60-90	60-90	60-90	18
3		Clinical Pharmacology	-	60-90	30-90	10
4		Community Medicine	-	15-90	60-0	7
5		Medicine	30-270	-	-	8
		Surgery	30-270	-	-	8
		TOTAL				69

4.0. Semesters, IX & X (5th Yr.)

S/N	Code	Course	Contact hours		Credit Hours
			Lectures	Practical hours	
1		Community Medicine	30		2
2		Forensic Medicine& Toxicology	30	90	4
3		Ophthalmology	15	90	3
4		Otolaryngology(ENT)	15	90	3
5		Dermatology and Venereology	15	90	3
6		Orthopaedics and Traumatology	60	90	6
7		Anaesthesiology and Critical Care Medicine	15	90	3
8		Molecular Medicine	15	45	2
9		Radiology and Medical Imaging	15	90	3
10		Psychiatry	45	135	8
11		Pediatrics and Child Health	60	360	12
12		Obstetrics & Gynaecology	90	360	14
13		Internal Medicine	45	720	19
14		Surgery	45	540	15
		TOTAL	555	2,790	100

Log books for Clinical placement will be developed.

4.1. Courses distribution: Semesters, IX & X (5th year.)

S/N	Code	Course	IX	X	Credit Hours
1.		Community Medicine	30	-	2
2.		Forensic Medicine	30-45	30-45	4
3.		Ophthalmology	15-90		3
4.		Otolaryngology(ENT)	15-90		3
5.		Dermatology and Venereology	15-90		3
6.		Orthopaedics and Traumatology	30-45	30-45	6

7.		**Anaesthesiology and Critical Care Medicine**	**15-90**		**3**
8.		**Molecular Medicine**	**15-45**		**2**
9.		**Radiology and Medical Imaging**	15-90		**3**
10.		**Psychiatry**	**45-45**	**45-45**	**8**
11.		**Pediatrics and Child Health**	**30-180**	**30-180**	**12**
12.		**Reproductive Health and Obstetrics and Gynaecology**	**45-180**	**45-180**	**14**
13.		**Internal Medicine**	**30-360**	**15-360**	**19**
14.		**Surgery**	**30-180**	**15-360**	**15**
		TOTAL			**97**

5. Semester XI (6th Yr.) Courses.

S/N	Code	Course	Contact hours		Credit Hours
			Lectures	Practical	
1		Internal Medicine	60	360	12
2		Surgery	60	360	12
3		Pediatrics& Child Health	30	180	6
4		Reproductive Health and Obstetrics &Gynaecology	30	180	6
5		TOTAL	180	1,080	36

6. Semester XII (6th yr.)(Purely clerkship)

S/N	Code	Course	Contact hours			Credit Hours
			Lectures	Practical	Tutorials	
1		Internal Medicine		720		16
2		Surgery		720		16

3		**Pediatrics & Child Health**		**360**		**8**
4		**Reproductive Health and Obstetrics &Gynaecology**		**360**		**8**
5		**TOTAL**		**2160**	**-**	**48**

Log books for Clinical placement will be developed.

Sample for the Transcript

FRONT PAGE

Republic of South Sudan

Photo of the Graduand. Name of the University Logo of the University

This is to certify that ……,……nationality, date of birth……,was accepted to the Faculty/College/School……..in the academic year……../……

General University Requirements, Semester 1, Academic year……../……scored the following results:

Subject	Remarks
Applied Mathematics	
Applied Chemistry	
Biology(Botany & Zoology)	
Principles of Genetics	
Behavioural Sciences (Psychology,Anthropology& Sociology)	
Computer Sciences	
Communication Skills for health workers	
Applied Physics	
South Sudan Foundation	

Passed General University requirements and promoted to semester II

Semester II& III academic year……/……scored the following results:

Subject	Remarks
Human Anatomy	
Medical biochemistry and Molecular Biology	
Medical Physiology	

Passed semester II&III and promoted to semester IV&V

Semester IV&V academic year……/……..scored the followings

Subject	Remarks
Human Anatomy	
Medical biochemistry and Molecular biology	
Medical Physiology	

Passed part one MBBS and promoted to semester VI

Semester VI, VII &VIII academic year……/……scored the followings

Subject	Marks
Medical Microbiology and Immunology	
Pathology	
Clinical Pharmacology	

Passed semester VI,VII &VIII and promoted to IX

Semester IX and X academic year……./……scored the following results

Subject	Marks
Community Medicine	
Forensic Medicine and Toxicology	
Ophthalmology	
Otolaryngology(ENT)	
Dermatology and Venereology	
Orthopaedics and Traumatology	
Anaesthesiology and Critical Care Medicine	
Molecular Medicine	
Radiology and Medical Imaging	
Psychiatry	

Passed semester IX&X and promoted to semester XI

Semester XI and XII academic year……/…….scored the following results

Subject	Remarks
Internal Medicine	
Surgery	
Pediatrics and Child Health	
Obstetrics and Gynaecology	

Passed final MBBS academic year ……/…….

N.B. The medium of instruction is in English language.

---------- …….. ----------

Dean of Faculty/College/School Registrar Secretary for Academic Affairs

This certificate will be considered invalid if there are any alterations or Erasure of information in this certificate.

Address of the institution ……..,contact email, telephone

BACK PAGE: CREDIT HOURS and the grading system

General University Requirements, Semester I

Subject	Credit Hours
Applied Mathematics	
Applied Chemistry	
Biology(Botany & Zoology)	
Principles of Genetics	
Behavioral Sciences (Psychology, Anthropology& Sociology)	
Computer Sciences	
Communication Skills for health workers	
Applied Physics	
South Sudan Foundation	

Semester II& III

Subject	Credit Hours
Human Anatomy	
Medical biochemistry and Molecular biology	
Medical Physiology	

Semester IV&V

Subject	Credit Hours
Human Anatomy	
Medical biochemistry and Molecular biology	
Medical Physiology	

Semester VI, VII &VIII

Subject	Remarks
Medical Microbiology and Immunology	
Pathology	
Clinical Pharmacology	

Semester IX and X

Subject	Remarks
Community Medicine	
Forensic Medicine	

Ophthalmology	
Otolaryngology(ENT)	
Dermatology and Venereology	
Orthopaedics and Traumatology	
Anaesthesiology and Critical Care Medicine	
Molecular Medicine	
Radiology and Imaging	
Psychiatry and Mental Health	

Semester XI and XII

Subject	Remarks
Internal Medicine	
Surgery	
Pediatrics and Child Health	
Reproductive Health and Obstetrics and Gynaecology	

Grading system.

Marks %	**Letter grade**	**Letter wording**	**Grade points**
80-100	A	Excellent	4.00
70-79	B+	Very Good	3.50
60-69	B	Good	3.00
50-59	C	Pass	2.00
<50	F	Fail	0.0

Grade Point Average scoring is a 4-point system with a maximum score of 4 points.

22/11/2021

National Medical Curriculum Validation Workshop 17 to 20 November 2021

Crown Hotel

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F F F F (marginal annotations beside rows 41, 44, 46, 47)