CURRICULUM
FOR
MEDICAL DEGREE PROGRAMME

[Volume 1]

FACULTY OF MEDICINE

UNIVERSITY OF JAFFNA

NOVEMBER 2019

This curriculum was approved at the 23rd meeting of the Medical Education Cell held on 03.01.2020, Meeting of the Special Faculty Board held on 07.01.2020, meeting of the Curriculum Evaluation Committee of the University of Jaffna held on 24.01.2020 and at the 442nd Senate meeting held on 28.01.2020.

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Chapter 1
Introduction

The Jaffna campus of the University of Sri Lanka was established under the University of Sri Lanka Act number 1 of 1972. It became an autonomous University when the Universities Act No. 16 of 1978 was passed in Parliament. Faculty of Medicine was established in Jaffna on 8th of October 1978. The Faculty of Medicine developed its curriculum through the Curriculum Committee for the programme in medicine during the early years.

The curriculum of the Medical study program was revised completely during the workshops conducted in 2007 and 2009 under QEF grant of the IRQUE project of the World Bank and in 2011 with the help of Jaffna Medical Faculty Overseas Alumni. Synchronization of the subjects started with the revision and is being improved year after year. It was also decided to move towards changing the traditional teaching / learning methods to SPICES* as far as possible and to improve assessment methods to be more structured and objective. At the workshop held on Problem Based Learning by the Medical Education Unit in October 2012 it was decided to introduce a few PBLs in 2013 and to introduce them to the curriculum based on the outcome.

The 2019 curriculum revision made the curriculum to move forwards towards more synchronisation and possible modular system of curriculum. It is noteworthy to a module on research as the first step towards this. A minimodule on immunology and medical humanities was also considered.

***SPICES** - **S**tudent-centred learning, **P**roblem-based learning, **I**ntegrated or inter-professional teaching, **C**ommunity- based education, **E**lective studies, and a **S**ystematic or planned approach

Chapter 2
GENERAL CONSIDERATIONS

- Degrees awarded- Bachelor of Medical Sciences [BMSc]and Bachelor of Medicine and Bachelor of Surgery [MBBS] (Jaffna)

- University awarding the degree - University of Jaffna, Sri Lanka.

- Admission to Undergraduate Programme - The University Grants Commission of Sri Lanka selects students for all medical schools in Sri Lanka based on their performance in the G.C.E (A/L) examination held by the Department of Examination, Sri Lanka.

- 150 students are admitted each year to the Jaffna Medical Faculty.

- Obligation of the Curriculum - The curriculum is guided by the Subject Benchmark Statement in Medicine, published by the CVCD and the Prescribed Standards for Undergraduate Medical Education of the Sri Lanka Medical Council.

- Medium of instruction - The programme is conducted entirely in English.

- Duration of the entire programme is five years followed by one year of Internship. Each academic year consists of three terms of ten to thirteen weeks each for activities in the Faculty. End of each term will be determined by completion of the teaching / learning activities allocated for that term. Clinical teaching at the Teaching Hospital is a continuous process with short breaks only.

- Lectures and Practical classes are conducted in the Faculty and in the clinical lecture hall at the Medical Students Hostel. About 95% of the clinical course is conducted at the Teaching Hospital, Jaffna. Base Hospital, Tellippalai which is about 16 kilometres from the Faculty and the Chest Clinic, Jaffna are regular teaching facilities for psychiatry and chest diseases respectively. Preventive aspects are taught in the Community Medicine Project area in the Nallur MOH area. The students are encouraged to go to wider areas for community programs.

- Senior teachers from other Medical Faculties and consultants from Government Hospitals are invited to serve as external examiners for all end-of-course examinations.

Chapter 3
Vision, Mission and Outcome of the Medical Course

3.1. Vision

To be a leading centre of excellence in teaching learning, research and scholarship in the field of medicine.

3.2. Mission

To be a leading centre of excellence which produces intellectual, competent, compassionate and dedicated health care professionals to meet the emerging needs of the local, national and international community.

3.3. Graduate profile

1. Apply the knowledge in basic and behavioural sciences in solving individual and population health issues.
2. Demonstrate communication, clinical and procedural skills in patient care.
3. Investigate, diagnose and manage common clinical problems and emergencies.
4. Promote individual and population health and institute preventive measures.
5. Utilise IT skills and record keeping skills necessary for medical practice.
6. Demonstrate leadership qualities, administrative skills and management skills.
7. Perform medicolegal procedures and provide expertise to the court of Law.
8. Demonstrate self learning and continuous professional development.
9. Apply the principles of ethical practice in personal and professional life.
10. Educate peers and other members of the health care team.
11. Perform critical appraisal of research literature, practice evidence based medicine and conduct research.
12. Enhance public health through promotion of peace and prevention of violence.

Chapter 4
Programme Structure

4.1. Introduction

The programme is divided into three phases and each phase is completed with an end of phase examination. The Pre-clinical phase, conducted during Phase I, provides learning of structure and function of the human body and introduces their application to clinical and community aspects. During Phase II, students go for clinical phase at the Teaching Hospital in the mornings and for Para-clinical phase in the afternoons at the Faculty. The Para-clinical subjects deal with abnormal structure and function in disease states and their application in clinical situations and prevention and control of diseases. Phase II ends with the Second Examination for Medical Degrees. Phase III comprises Clinical subjects exclusively. There will be a 4-week elective appointment and an OSCE on clinical subjects before starting the Professorial appointments.

4.2. Pre-clinical phase [Terms 1 to 4]

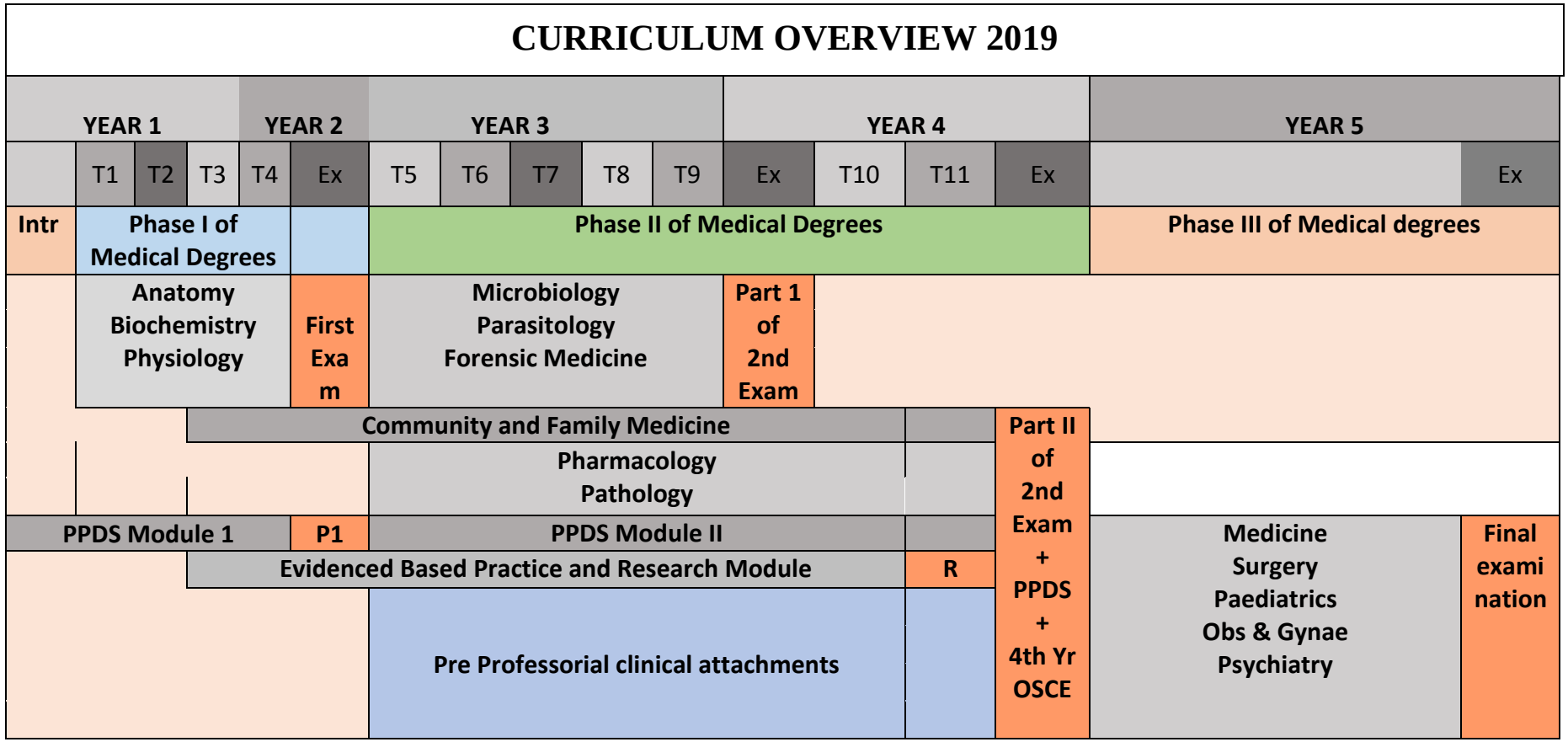
It comprises an Introductory Period of 4 weeks and four terms of 11-12 weeks duration. The First Examination for Medical Degrees is conducted at the end of phase I. The examination is held twice a year. It is a bar examination: the students proceed to Phase II only after passing the First Examination for Medical Degrees.

The introductory programme is designed for newcomers to facilitate understanding of the university set up and to acclimatize them to the University environment by way of lectures, group work, visits and training in first aid. The English Co-module is conducted to enable the students to follow the course of Medicine in English Medium for students identified at the screening test on admission. The Co-module in English is completed during the introductory period. The Co-module in IT commences with the introductory course and continues until the end of the first term.

The Personal Professional Development Stream [PPDS] is conducted during the introductory period and will continue up to the end of the term 2. The students are also given exposure to Community perspectives by the Department of Community and Family

Medicine during the terms 2 and 3. The students are also introduced into research concepts under the Evidence Based Practice and Research Module (EBPR).

The main subjects of the Pre-clinical phase are Anatomy, Biochemistry and Physiology. These subjects will be conducted during the 4 terms of the pre-clinical phase. They are synchronized as far as possible to facilitate understanding and correlation by the students.


CURRICULUM OVERVIEW 2019
YEAR 1
YEAR 2
YEAR 3
YEAR 4
YEAR 5
T1
T2
T3
T4
Ex
T5
T6
T7
T8
T9
Ex
T10
T11
Ex
Ex
Intr
Phase I of Medical Degrees
Phase II of Medical Degrees
Phase III of Medical degrees
Anatomy
Biochemistry
Physiology
First Exam
Microbiology
Parasitology
Forensic Medicine
Part 1 of 2nd Exam
Community and Family Medicine
Pharmacology
Pathology
Part II of 2nd Exam + PPDS + 4th Yr OSCE
PPDS Module 1
P1
PPDS Module II
Evidenced Based Practice and Research Module
R
Pre Professorial clinical attachments
Medicine
Surgery
Paediatrics
Obs & Gynae
Psychiatry
Final examination

4.3. Para-clinical Phase [Terms 5 to 11]

Students enter the Para-clinical phase after completing the pre-clinical phase. The phase is conducted in the afternoons as the students go for clinical phase in the mornings. Microbiology, Parasitology, Community and Family Medicine, Forensic Medicine, Pathology and Pharmacology are commenced in term 5 and continue up to term 11. Part I of the Second Examination for Medical Degrees will be conducted at the end of the term 9 comprising of Microbiology, Parasitology and Forensic Medicine. Part II of second examination for medical degrees will be held at the end of term 11 and will comprise Pharmacology, Pathology and Community and family medicine. In addition, lectures in Medicine, Paediatrics, Psychiatry and Surgery will also be conducted during terms 5 to 11 synchronized with para-clinical subjects to permit full clinical teaching during the Phase III. Further, the second part of PPDS is conducted from term 5 to term 11.

4.4. Clinical Phase

The clinical phase starts during the Phase II but introduction to clinical situations are provided in Phase I in the form of applied anatomy and clinical demonstrations in physiology with the objective of showing the relevance of basic sciences for clinical practice. They go to the teaching Hospital for clinical studies in the morning and attend the para-clinical studies in the afternoons during Phases II. Students spend the entire day in the hospital during the professorial appointments in the Phase III.

The clinical phase starts with four weeks of introductory program. Then the students are posted for the first appointment in Medicine of 6 weeks and Surgery of 6 weeks. This is followed by 4 week appointments in Paediatrics and Obstetrics & Gynaecology followed by one week appointments in Blood Bank, Venereology, Neurology, Neurosurgery and Oromaxillary surgery and two week appointments in Chest medicine, Radiology, Clinical Pathology, and Dermatology.

Students are then posted to two-week appointments in Orthopaedics, 6-week appointment in Community Medicine, 4 week appointment in Family Medicine and 4-week appointment in Psychiatry. Students are posted to second Paediatrics and second Obstetrics & Gynaecology

and Forensic Medicine of four weeks and two-week appointments in Otolaryngology [ENT], Ophthalmology, Oncology, Cardiology and Anaesthesia & Intensive Care.

Finally they go for the second appoint in Medicine for 6 weeks and second appointment in Surgery for 6 weeks. At the end of all the pre-professorial clerkships, the students are taken on an educational tour of two weeks to visit important national institutions related to health and at the same time they will visit other Faculties of Medicine to improve social harmony.

At the end of all these rotations the students are sent for elective appointments of four weeks. Before entering the Final year appointments, An **OSCE** will be conducted to ensure that the students have acquired the prescribed clinical knowledge, skills and attitudes during the pre-professorial appointments. The marks from this OSCE will be added to the continuous assessment component of the respective contributing suject. Finally, they go for eight weeks of professorial appointments in Medicine, Surgery, Paediatrics and Obstetrics & Gynaecology and Psychiatry.

All the major appointments and most of the short appointments are held in the Teaching Hospital. They will have to go to the Chest Clinic at Pannai, Psychiatric unit at BH Thellipallai, Oncology and BH Thellipalai and many other institutions as need arises.

More appointments will be included as new units are developed in the Teaching hospital. However, patients related to all subspecialties are exposed to students as those patients are managed in Medical or Surgical Units if no special unit is available.

4.5. Teaching / Learning process

A flexible schedule of teaching/learning activities will be used. The teaching sessions will be arranged to synchronize the subjects as far as possible to facilitate better understanding. The coordinators [pre, para and clinical coordinators] will meet the persons in charge for teaching of the relevant subjects regularly, preferably weekly, and plan the teaching sessions of each week. Clinical significance of the basic sciences will be taught in Phase I and basic sciences will be revisited during clinical teaching. Teaching / Learning activities of each subject are described with detail syllabus of each subject in Chapter 5.

All examinations are conducted by the Teachers in the Faculty, Extended Faculty, Consultants from other hospitals and Teachers from other Faculties in the Island. The MCQ for the final examination is set by a combined panel of examiners from all Medical Faculties. The marks of this MCQ and Clinical examination are computed to prepare the common merit list of the graduates from all Faculties of Medicine in the Island.

4.5.1. Problem based learning

Problem based learning is defined as active learning stimulated by, and focused around a clinical, community or scientific problem. This is a small group activity. Students are given a problem commonly as a clinical scenario and they learn the knowledge necessary and use this to solve the problem. The process will be facilitated by Tutors/ Facilitators. The attendance for these sessions is compulsory (100%). Up to 10% absenteeism could be acceptable with valid reason accepted by the Phase coordinator.

Aims of introducing problem-based learning in the curriculum

1. Increase student centered learning activities in the curriculum.
2. Enhance opportunities of vertical and horizontal integration within subjects at each level of the curriculum.
3. Develop students' competencies such as Deep Approach to Learning, Dealing with unfamiliar situations, Critical thinking, Problem solving, Adopting holistic approach, Empathetic outlook, Appreciation to different views, Working in teams, Reflective practice and Self directed learning.

4.5.2. Multi-Disciplinary seminars

For the selected common medical conditions, multidisciplinary seminars to be conducted by expertise from different disciplines. Seminars will start from latter part of term 8. Number of seminars and topics need to be decided.

4.5.3. Integrated tutorial

Integrated tutorials are modified PBLs. For common medical conditions, after the completion of teaching activities of respective sections, there will be 2 sessions of integrated tutorial for each topic.

Session 1 – development of learning objectives

Students are given a clinical scenario and they develop learning objectives based on the scenario. They work on the learning objectives in small groups (12-15). Two to three facilitators are present to guide the students.

Session 2 – discussion

As a group they discuss each learning objective. During the discussion expertise from different discipline are present and provide their observations and feedback.

4.5.4. Evidence Based Practice and Research Module (EBPR)

The aim of this module is to provide knowledge, attitude and skills required for basic doctor in relation to evidence-based practice.

Objectives:

- Enhance the skills of utilising available evidence
- Understand practical and theory relevant to their practice by discussing relevant research
- Exposure to understand research early in their course and to retain it till the end of the course
- Perform a small-scale research project

This EBPR module will start from Introductory Module when the students enter the faculty and continue till the end of their final year. In the Introductory period, familiarisation to concept of research and technical terms will be given using interesting video clips, brief articles on simple topics. English and IT teaching during this introductory period will also use simple components from research.

4.5.5. Clinical Lecture Demonstrations

Clinical Lecture demonstration (CLD) is conducted as problem-based learning in large groups using real patients, simulated patients, video clips / demonstrations or case scenarios are conducted in Phase III. Clinical coordinator would oversee organizing the CLD.

List of Cases/Case scenarios from each of five major clinical specialties (Medicine, Obstetrics and Gynaecology, Paediatrics, Psychiatry and Surgery) would be given to the students well in advance and the cases in each specialty would be discussed for one hour in rotation on Fridays from 1.00pm to 4.00pm.

Senior Lecturers and specialist consultants from the university clinical departments and consultant psychiatrists from the Teaching Hospital, Jaffna will be conducting these CLDs.

Objectives:

- Develop the approach to a patient with a clinical problem
- Recall the patho-physiology and describe the clinical condition and its complications.
- Explain the concepts behind eliciting symptoms and signs in a patient
- Demonstrate and interpret findings in a clinical case to sketch a working diagnosis and differential diagnosis
- Evaluate the clinical condition and prioritize the components of patient management based on critical analysis and clinical judgment
- Explain the concept of holistic approach to a patient with clinical problem
- Develop competency in communication skills.

Attendance:

It is **compulsory** for a final year medical student to have 90% attendance in CLD to complete the professorial appointment and to become eligible to sit the final MBBS examination.

4.6. Student Activities

The students are encouraged to engage in a variety of student activities to develop their soft skills and to engage in recreation. The activities could be religious, cultural, social or social welfare in nature. These activities should be undertaken through appropriate student bodies with the prior approval of the student councillor, Senior Treasurer, the Dean and the Vice Chancellor according to the University rules and regulations.

The students are expected to elect their representatives at various levels such as small group, a batch or the entire student body in order to facilitate or organize academic activities and look after the needs and welfare of the students.

The students themselves have form a peer support group to look after the welfare of fellow students. A regular publication of the journal "Naadi" is also a student led activity.

4.7. Student Attendance

Student attendance will be marked in all teaching sessions.

Phase I:

The attendance will be evaluated at the end of terms 3 and 4. The students should have 80 % attendance in practical and tutorial sessions of all subjects including PPDS I and 100% attendance in the PBL sessions (Up to 10% absenteeism in could be acceptable with valid reason accepted by the Phase coordinator). Students whose attendance is found to be inadequate will be instructed to follow the course with the subsequent batch. If such student fails to show 80 % attendance in the repeated period, that student will be referred to a special committee of three Senior Teachers to analyse the problem of the student and to suggest appropriate course of action. The suggestion will be placed before the Faculty and the Senate for final decision. All students who repeat the course will lose eligibility for class at the First Examination for Medical Degrees unless the Faculty Board and the Senate accept the explanation given by the student as valid.

Phase II:

The attendance of the para-clinical courses will be evaluated at the end of the terms 7, and 11. The students should have 80 % attendance in practical and tutorial sessions of all subjects including PPDS II and 100% attendance in the PBL sessions, Multidisciplinary seminars and EBPR module activities (Up to 20% absenteeism could be acceptable with valid reason accepted by the Phase coordinator).

The attendance in the clinical appointments in Forensic medicine, pathology and Community and Family Medicine will be considered as 100% (up to 20% absenteeism could be acceptable with a valid reason accepted by the phase coordinator).

Students whose attendance is found to be inadequate will be instructed to follow the course with the subsequent batch. If such student fails to show 80 % attendance in the repeated period, that student will be referred to a special committee of three Senior Teachers to analyse the problem of the student and to suggest appropriate course of action. The suggestion will be placed before the Faculty and the Senate for final decision. All students who repeat the course will lose eligibility for class at the first examination for medical degrees unless the Faculty Board and the Senate accept the explanation given by the student as valid.

Phase III:

The attendance at the pre professorial clinical appointments will be assessed at the end of the postings. Students with less than 90 % attendance in any clerkship and the absence up to the balance 10 % not approved by the consultant, the student will have to repeat the appointment with the same consultant if that consultant is agreeable or under another consultant who will accept the student and sign the completion of the appointment.

The Clinical Coordinator will permit students to go over to professorial appointments only on satisfactory completion of the prescribed pre-professorial appointments. Students who fail to commence professorial appointments with the proper batch loose eligibility for class unless the excuse given by the student is accepted by the Faculty and Senate as valid.

The attendance at the professorial appointments will be evaluated at the end of the rotations and students with less than 90 % attendance and the absence for the balance 10 % not approved by the consultant will be requested to follow the professorial course with the subsequent batch without eligibility for class unless the excuse submitted by the student is accepted by the Faculty board and the Senate as Valid.

In case of sickness the student should get examined by the UMO or a consultant at the teaching Hospital or a government medical officer if the student is in a faraway place. The medical certificate should be duly certified by the UMO and submitted to the faculty within two weeks of the illness.

4.8. Contribution of Subjects to Curriculum Outcomes

Subjects	OUTCOMES											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
English		X										
IT					X							
PPDS	X	X				X		X	X			X
Anatomy	X	X	X			X		X	X	X		
Biochemistry	X		X	X	X	X		X	X		X	
Physiology	X	X	X		X	X		X				
Microbiology	X		X	X				X		X	X	
Parasitology	X		X	X				X				
Community and Family Medicine	X	X	X	X	X	X		X	X	X	X	X
Forensic Medicine	X						X					
Pathology	X		X	X				X		X	X	
Clin. Pharm. & Therapeutics	X	X	X		X			X	X	X		
Psychiatry	X	X	X	X			X	X	X			
Medicine	X	X	X	X	X	X		X	X	X	X	
Obstetrics & Gynaecology	X	X	X	X	X	X	X	X	X	X	X	
Paediatrics	X	X	X	X	X	X	X	X	X	X	X	
Surgery	X	X	X	X	X	X		X	X	X		
Student Activities		X				X			X			X

Chapter 5
Programme Details

5.1. Introductory Programme

[Person in Charge- Pre-Clinical Coordinator]

The program consists of lectures and visits to key areas related to University and the Medical Course during the first eight weeks. This includes a full programme of first aid. The first aid programme is aimed at introducing lifesaving skills at layman level at the onset for them to keep it developing through the medical curriculum.

Hr	**Activity**	**Content/Topic**	**Person/Department**
4	Welcome	Welcome programme	Key person
2	Group work	Introduction to each other	Preclinical coordinator
1	Lecture	Medical Curriculum	Head MEU
1	Lecture	Student welfare	AR/welfare
1	Lecture	Medical students and the community	Dept. Community Medicine
1	Lecture	Health Facilities in the University	UMO
2	Lecture	Recreation activities in the Faculty, MSU and ITC facilities	MSU
2	Visit	Sports in University	Dept. of Physical Education
1	Lecture	Student discipline	Student counselor
1	Lecture	Examination Regulations	SAR Examination branch
1	Lecture	Carrier Prospects	Carrier Guidance Advisor
2	Visit	FM premises, University, Health Centre	MSU
2	Visit	Library	Snr. Assist. Librarian
2	Visit	Teaching Hospital	MSU
1	Lecture	Introduction to Well-being centre	Officer in charge of well-being centre
5	Lecture	Introduction to Anatomy	Department of Anatomy
2	Lecture	Introduction to Pharmacology	Department of Pharmacology
6	Training	First Aid	St. John ambulance
10	Lecture/SGD	|Tamil/Sinhala Language	External Resource
2	SGD	Introduction to medical professionalism	Head/MEU
2		Post evaluation	Preclinical coordinator

Summary

Activity	Hours
Lectures	21
Visits	11
Group work	2
Training	14
PPDS Activities	17
Total	**65**

5.2. IT Co Module for Medical Course

[Person in Charge- Head, Computer Unit through Pre-Clinical coordinator]

5.2.1. Objectives:

This co-module in IT is expected to provide sufficient knowledge, skills and attitudes to make use of the Information Technology for effective learning and practice in Medicine.

Intended Learning Outcomes:

- Relate the computer's functionality and its malware such as viruses.
- Outline Computer ethics and practice them.
- Choose word processing software for document preparation and spreadsheet software to organize and categorize data into a logical format.
- Develop databases for managing reference material, notes, patient details etc., for storage and future retrieval.
- Choose and effectively deliver a presentation.
- Demonstrate and use statistical packages to carry out data analysis.
- Compile literature survey using Internet resources for effective communication of new knowledge.

The teaching and learning activities include Lectures for theoretical components and practical training for applications with close guidance.

5.2.2. Syllabus of the IT Co-Module

1	Introduction to Information Technology	(5 Hrs - Lectures)
2	Advanced Techniques in Word Processing	(6 Hrs - Practicals)
3	Presentation Techniques	(3 Hrs - Practicals)
4	Application of Statistical packages	(15 Hrs - Practicals)

Introduction to Information Technology (5 Hrs)

Hours	Topics
1	System Unit, Input devices and their functions, Output devices and their functions and Secondary storage devices.
1	Application software - Tools for documentation and information management, Electronic Medical Record Keeping (EMR), Medical Databases, Graphics packages, Statistical software.
1	Use of computer networks and communication services – Web Browsing, e-mail, using Internet for literature survey.
2	Challenges of Information Technology - Health, Ergonomics & the Environment, Cyber Ethics, Threats and Safeguarding Computers and Communications Systems.

Advanced Techniques in Word Processing (6Hrs)

Hours	Topics
2	File management, Formatting Pages, Formatting Characters and Paragraphs, Columns, Tabs, Tables, Mail merge, Previewing and Printing Documents.
4	Documentation preparation for project reports/thesis

Presentation Techniques (3 Hrs)

Hours	Topics
1	Creating a Presentation, Editing a Presentation, Applying and Modifying Design Templates
1	Inserting Information into PowerPoint, Drawing and Modifying Shapes
1	Creating a Multimedia Presentation, Printing a Presentation, Setting Up and Delivering a Slide Show

Application of Statistical packages (15 Hrs)

Hours	Topics
6	Using Microsoft Excel for statistical work
1	Using R (Open Source software) for statistical work
8	Using Social science packages like SPSS
	• Entering data, variable types, variable labels, value labels, missing values.
	• Transforming data and creating new variables: recode, compute, count.
	• File manipulations: sort file, split file, select cases, merge files.
	• Drawing random samples.
	• Basic descriptive statistics: descriptive, frequencies, explore, crosstabs.
	• Graphs : histogram, error bar, box-plot, bar chart, scatter etc.
	• Reading data into SPSS data files from outer sources: excel files & text files.
	• Advanced statistical procedures such as: t-test, Chi-square, regression etc.
	• Creating, editing and running procedures from the syntax file.
	• Creating and editing output files.
	• Saving output files in different formats.

5.2.3. Method of evaluation

Theory - MCQ (40) Questions	01 Hour	30%
Practical - (Advanced Techniques in Word Processing, Presentation Techniques & Application of Statistical packages)	03 Hours	70%

The result will be **Pass** or **Fail**. Candidates must obtain **50 marks or above** to pass. Below 50 is considered as a Fail.

5.2.4. Reference

- Pearson, Introduction to Information Technology, 2nd Ed., ISBN: 978-81-317-6029-1
- Faithe Wempen, Computing Fundamentals: Introduction to Computers, ISBN: 9781119039716
- Steven Bright, Computer Fundamentals, ISBN-13: 978-1549528804
- Sara Baase, A gift of Fire: Social, Legal and Ethical Issues for Computing Technology, 4th ed., ISBN: 0-13-249267-9
- Joan Lambert, Curtis Frye, Microsoft Office 2016 Step by Step, Microsoft Press, ISBN: 978-0-7356-9923-6
- John Walkenbach, Microsoft Excel 2016 Bible: The Comprehensive Tutorial Resource, ISBN-13: 978-1119067511

5.3. English Co-module

[Person in Charge- Head, DELT through Pre-Clinical Coordinator]

5.3.1. Co-module Description

This Co-Module in ESL aims to enhance the communicative competence in all the four language skills (reading, listening, writing and speaking) of the students of the Faculty of Medicine to follow their course in medicine and in their profession afterwards. The duration of the course will be 50 hours. This is a co module which each student should pass before sitting for the First Examination for Medical Degrees. Teaching learning sessions are interactive where students must actively participate and perform. The IT laboratory at the Faculty will be used wherever possible to provide computer based teaching and the program will be available in the IT laboratory for self-learning of the students.
It contributes to outcome no 2 of the curriculum.

Objective

Fulfil their day-to-day professional and higher educational requirements in English, encounter the national, global demands in their respective fields and develop Basic Interpersonal Communicative Skills (BICS) and abilities in English and make them conversant in the language,

5.3.2. Intended Learning Outcomes:

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

- understand the general meaning of a short and complex text and extract important information
- understand the functions of discourse markers
- answer simple questions, finding main ideas from complex texts and separate main ideas and supporting ideas
- identify implicit information
- understand cause and effect and comparison and contrast
- identify ideas, opinions and attitudes from a wide range of texts and understand the connections between them.

- retrieve and synthesize information from a range of reference material using study skills such as skimming and scanning.
- summarize short and long texts
- adapt the appropriate style and register to different types of writing
- organize ideas effectively into paragraphs and use a range of appropriate linking devices
- understand and communicate factual information, abstract ideas and arguments at a more complex level, in both spoken and written form.
- reflect on their own experience and express ideas clearly.
- participate effectively in a conversation and develop the conversation based on other speakers' responses.
- understand simple explanations and descriptions.
- listen to a talk and understand the topic and main points;
- listen for information required for a specific purpose
- understand factual information, abstract ideas and arguments from a wide range of sources, e.g. recorded phone messages, announcements, dialogues, informal conversations, interviews and formal talks.

5.3.3. Syllabus of the English co-module

Hrs.	Skill (General)	Skill(Specific)
01	Reading	Understanding the general meaning of a short and complex texts and extract important information
02	Reading	Answering simple questions, finding main ideas from complex texts
01	Reading	Inferring word meaning
01	Reading	Understanding the functions of simple passive structures and basic modals
01	Reading	Identifying implicit information
02	Reading	Separating main ideas and supporting ideas
02	Reading	Understanding cause and effect and comparison and contrast
06	Speech	Introduce doctor-patient communication skills based on Calgary Cambridge model, Role play Speak about him/her, his/her background and on familiar topics such as ambitions, leisure activities, culture etc. using simple/complex language.
03	Speech	Deliver short speeches of about 2-3 minutes length on discipline related topics
06	Speech	Communicate information, abstract ideas and arguments at a more complex level, in both spoken and written form. Participate effectively in a conversation and develop the conversation based on other speakers' responses
01	Listening	Understanding simple explanations and descriptions
01	Listening	Understanding instruction of a process: e.g. Experiments
02	Listening	Differentiating main and supporting ideas and taking notes.
01	Listening	Understanding opinions and draw inferences
02	Writing	Writing short descriptions on familiar topics
02	Writing	Transfer of information-from graphic to text and vice-versa
04	Writing	Expressing cause and effect and comparison and contrast
04	Writing	Summarizing shorter and longer texts
08	Writing	Organizing ideas effectively into paragraphs and use a range of appropriate linking devices Selecting relevant information and ideas from a wide range of texts and develop it independently and effectively

Summary

Activity	**Intro**
Reading	10
Writing	20
Speech	15
Listening	05
Total	50

5.3.4. Evaluation and Marking Scheme

Components	
Reading	15%
Writing	40%
Listening	20%
Speaking	25%

- A placement test will be administered at the beginning of the course and the students will be grouped for instruction according to the marks they score in the test.
- All students must attend based on their grouping and instruction will vary. After the completion of instruction, end of course examination will be held. The components to be evaluated are stated above in the syllabus.
- A repeat examination will be held after six weeks from the date of the end of course examination
  - The examiners and the date of examination will be approved by the Faculty Board and the Senate.
  - Arrangement of the Hall and appointment of Supervisors and Invigilators will be done by the Assistant Registrar, Faculty of Medicine as for other examinations.
  - A Pre-Results Board shall be constituted as follows by the dean when the marks are ready:
    - Dean - Chairman
    - Preclinical coordinator
    - Examiner of the co module
- The results will be released to students' subject to confirmation by the senate.

- The candidates scoring above 50 marks will be declared as pass and others will be failures at the examination.

5.3.5. References

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5.4. Personal Professional Development Stream

[Person in Charge- Coordinator for PPDS]

5.4.1. PPDS Description

The aim of the PPDS is to develop Personal skills and personality of the students with a view to improve their learning abilities during the studentship and afterwards for continuous professional development and improve the quality of the service provided.

The PPDS is divided into four thematic areas to be covered in a spiral manner throughout the phases. The themes are:

- Personal development
- Professional development
- Leadership and management
- Ethics

The PPDS will be conducted by visiting staff and staff of the Faculty. The teaching learning process include discussions and group activities.

Students are evaluated by assignment, presentation, portfolio and end of course assessment by OSCE during Phase I at the end of term 3 and Phase II at the end of term 10. A score of 50% is needed to pass at each stage. Those who fail can sit a second examination which will be conducted 6 weeks later.

The students will be permitted to enter the Professorial appointments (phase III) only if they qualify at both Phase I and Phase II examinations in PPDS.
The students should have 80% attendance in all PPDS activities specified in the curriculum to sit the end of course assessment in PPDS. Students without necessary attendance will be given a chance to rectify the attendance with the next batch. If they show satisfactory attendance prior to the examination they will be allowed to sit the exam with their own batch.

5.4.2. Intended Learning Outcomes

Personal Development	
Aim	Improving Life skills by enhancing effectiveness in all aspects of personal development and interactions
Intended learning Objectives **Introductory period**	• Develop key attributes to know self • Relate learning as a discipline • Appraise enhancing personality and know the importance of achievement • Identify stress reducing techniques like relaxation, mindfulness and coping with stress • Identify effective relationship and enriching the relationship • Demonstrate time management • Develop attributes and soft skills to enhance personal role in the Practice of Medicine • Utilise effective communication skills

Phase I	• Develop Motivation
	• Recall Learning as a discipline, memory and enhancing memory, enhancing personality
	• Adapt the importance of extracurricular activities in healthy lifestyle
	• Apply attributes to Manage emotions
	• Adapt good behaviour by knowing
	  o Changing individual behaviour
	  o Moral judgement and behaviour
	  o Dynamics of popularity
	o Develop higher skills in communication by improving interpersonal communication
	  o Being an active listener
	  o Develop the presentation skills

Phase II	o Develop improving life skills by enhancing effectiveness in all aspects of personal development and interactions by Managing emotions Cultivating good behaviour by knowing ▪ Coping with loss ▪ Demonstrating empathy ▪ Anger management ▪ Sexual health o Develop attributes and soft skills to enhance personal role in the Practice of Medicine by Learning effective presentation skills and preparing for medical examinations.

Professional Development	
Aim	Enhance professionalism by understanding it in the context of the society, develop attributes and value it as a life long learning experience
Intended Learning Outcomes **Introductory period**	○ Explain the medical profession in the context of Society ○ Relate the perspective of a doctor ○ Show and practice etiquette in medical field ○ Developing the attributes of Medical Professionalism ○ Define medical professionalism ○ Adapt basics of doctor-patient relationship ○ Value medicine involves life-long learning, continued professional development and ongoing appraisal of performance of self and the quality of the practice ○ Demonstrate self-care, self-reflection and self-assessment ○ List the bodies that maintain the professional conduct in Sri Lanka ○ Identify online behaviour that is inconsistent with professionalism
Phase 1	• Value the medical profession in the context of Society ○ Value medicine as a practice of science and art • Developing the attributes of Medical Professionalism ○ Describe professional conduct ○ Understand interpersonal professionalism ○ Adopt an ethical standard of practice • Recognise medicine involves life-long learning, continued professional development and ongoing appraisal of performance of self and the quality of the practice • Adapt principles of life-long learning
Phase II	• Understanding the medical profession in the context of Society ○ Demonstrate healthy doctor-patient relationship ○ Understand patient centeredness • Developing the attributes of Medical Professionalism

	○ Understand collective professionalism ○ Identify values and behaviors related to patient centered care ○ Relate to honesty, integrity, empathy and altruism as ethical practice ○ Observe professional conduct in clinical setting ○ Interpret role modelling in medical practice ○ Know the types of professional deficits in clinical environment • Recognise medicine involves life-long learning, continued professional development and ongoing appraisal of performance of self and the quality of the practice ○ Analyse the concepts of in-depth self-evaluation and self-assessment in the clinical context ○ Demonstrate social responsibility ○ Demonstrate life-long learning

Leadership and Management	
Aim	Develop effective leaders as well as managing others fairly and effectively and increasing levels of engagement, commitment, motivation and performance
Intended Learning Outcomes **Introductory Period**	• Develop effective time management • Model clinical leadership • Formulate a self-development plan • Infer principles of teamwork in medicine
Phase I	• Demonstrate the ability to work as a team • Consolidate the self-development plan • Understand the principles of leadership and the application in medical practice
Phase II	• Develop the ability to work with many stakeholders and other healthcare professionals • Understand leadership skills and decision-making skills • Formulate own leadership skill development plan • Understand the challenges of being a leader • Understand the concepts of conflict resolution • Understand clinical governance

Ethics	
Aim	Providing simple, accessible, and culturally neutral approach to thinking about ethical issues in health care including respect for autonomy, beneficence, non-maleficence, and justice. Basic moral analytical framework and moral language that can help make decisions
Intended Learning Outcomes **Introductory period**	• Develop the etiquettes in medical field • Model the behavior in the Faculty and public domains • Choose and implement dress code • Explain the concept of punctuality • Select the communication style- with colleagues and community • Describe the use of social media/IT • Identify self-discipline
Phase I	• Apply the principles of ethics in medical practice ▪ Discus the social ethics ▪ Explain Research ethics ▪ Identify human rights/rights of patients ▪ Recognize gender equality
Phase II	• Apply the principles of ethics in medical practice ▪ Discus the social ethics ▪ Explain Research ethics ▪ Identify human rights/rights of patients ▪ Recognize gender equality

5.4.3. Detail Syllabus

Introductory Period		
1	Discussion/group work	Introduction to PPDS - curriculum and exam methods
2	Discussion/group work	Medical Profession : Different perspective
1	Discussion/group work	Ethics and Etiquettes in medical field
1	Discussion/group work	Planning and managing the "TIME"
2	Discussion/group work	Know thyself , motivation, enhancing personality, achievement
2	Discussion/group work	Learning basic and applied medical science in phase I
2	Discussion/group work	Building effective Relationship / Enriching the relationships
2	Discussion/group work	Stress and Coping with stress
2	Discussion/group work	Relaxation techniques
1	Discussion/group work	Facing the time of crisis
1	Discussion/group work	Mindfulness
Term 1		
2	Discussion/group work	Maintaining a Portfolio
2	Discussion/group work	Learning as skill / discipline – learning, memory, enhancing memory
2	Discussion/group work	Active listening
2	Discussion/group work	Managing emotions
2	Discussion/group work	Building effective relationship
2	Discussion/group work	Growing with life : the role of "Extra-curricular" activities in the medical field
		Cultivating good behavior I
2	Discussion/group work	Changing Individual behaviour
2	Discussion/group work	Moral Judgement and Behaviour
2	Discussion/group work	Dynamics of Popularity
		Enhancing communication skills I
2	Discussion/group work	Interpersonal
2	Discussion/group work	Exam – viva voce, written
2	Discussion/group work	Reflection and self-assessment
1	Discussion/group work	Human Rights

Term 2		
2	Discussion/group work	Problem solving skills
2	Discussion/group work	Negotiation & Mediation
2	Discussion/group work	Presentation skills
		Cultivating good behavior II
2	Discussion/group work	Coping with loss
2	Discussion/group work	Demonstrating empathy
2	Discussion/group work	Anger management
2	Discussion/group work	Sexual Health
2	Discussion/group work	Cooperation
2	Discussion/group work	Perception
2	Discussion/group work	Preparation for Examinations
2	Discussion/group work	Problem solving skills
2	Discussion/group work	Negotiation & Mediation

Term 3		
	Assignment -1	
	Presentation -1	General topic – 5 minutes
	Portfolio assessment	

Summary of Phase I

Activity	Intro	Term 1	Term 2	**Total**
Discussion/Group work	17	25	24	**66**

Term 5		
2	Discussion/group work	Medical Ethics
		Enhancing Communication Skills II
2	Discussion/group work	Communication with patients
2	Discussion/group work	Emotions : Mixed emotions and Fickle emotions
2	Discussion/group work	Doctor patient relationship
		Medical Professionalism I
2	Discussion/group work	Dealing with difficult situation
2	Discussion/group work	Moral Judgement and Behaviour
Term 6		
2	Discussion/group work	Emotional Intelligence

2	Discussion/group work	Stress Management – Before, during & Aftermath
2	Discussion/group work	Developing social support system for stress management
2	Discussion/group work	Gender Equality
2	Discussion/group work	Teamwork
2	Discussion/group work	Dynamic of popularity
2	Discussion/group work	Group Dynamic
2	Discussion/group work	Emotional Intelligence

Term 7		
2	Discussion/group work	Time Management in clinical setting
2	Discussion/group work	Research Ethics
2	Discussion/group work	Social Ethics
2	Discussion/group work	confidentiality / Data privacy
2	Discussion/group work	Informed consent
2	Discussion/group work	Managing complaints
	Assignment 1	

Term 8		
		Enhancing Communication Skills III
2	Discussion/group work	Advanced communication skills
2	Discussion/group work	Continues Medical Education
2	Discussion/group work	Audits of practice environment
		Medical Professionalism II
2	Discussion/group work	Leadership – decision making, conflict resolution, assertiveness
Term 9		
	Presentation 1 & 2	Will be assessed with community medicine presentation
	Presentation 3	General Topic – 5 minutes
	Assignment 2	

Summary of Phase II

Personal Professional Development Stream II							
	Term 5	Term 6	Term 7	Term 8	Term 9	Term 10	Total
Discussion/Group work	12	16	12	8			**48**

5.4.4. Evaluation

Type of Evaluation		Distribution of Marks- First examination	Details of evaluation
1	Phase I Evaluation ▪ Assignment* ▪ Presentations* ▪ Portfolio* ▪ OSCE	 10 20 20 50	OSCE 6 stations
2	Phase II Evaluation ▪ Assignment* ▪ Presentation* ▪ Portfolio* ▪ OSCE	 10 20 20 50	

***Note: In assignments, presentations and portfolio students will be asked to repeat it until they get satisfactory level in each component (50 marks)**

Phase I

- Assignment – one
- One (1) presentation – 5 minutes presentation in general topic
- Portfolio assessment

Phase II Examination:

- Assignments - two
- Three (3) Presentation – Two presentation will be assessed with community medicine presentation. One presentation in general topic for 5 minutes.
- Portfolio assessment
- End of course assessment will be held in term 9. It will be assessed by six OSCE station, each station will assess the different communication skills. Candidates should get minimum 50 marks to pass the examination.
- A second examination will be conducted 6 weeks after the results of the first exam are released.
- Releasing of Results:
  - The examiners and the date of examination will be approved by the Faculty Board and the Senate.
    Arrangement of the Hall and appointment of Supervisors and Invigilators will be done by the Assistant Registrar, Faculty of Medicine as for other examinations.
  - A Pre-Results Board shall be constituted as follows by the dean when the marks are ready:Dean- Chairman, Preclinical/ Para-clinical coordinator, PPDS coordinator.

  - The results will be released to students' subject to confirmation by the senate.

The candidates scoring above 50 marks will be declared as pass and others will be failures at the examination.

5.4.5. References

1. The Practice of Behavioural and cognitive Therapy**.** R.Drumond, Cambridge University press.
2. Introduction to Counselling & Guidance**.** Robert L.Gibson and Marianne H Mitchelkl. Prentice Hall of India, India
3. I am OK-You are OK**.** By Thomas A, Harris M.D, New York: Avon, 2004.
4. Tomorrow's Doctors.Published by General Medical Council, UK.
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7. Principles of Management and Administration. D.Chandra Bose, Printice Hall of India, 2004.
8. Management: Meeting and Exceeding customer expectations. Warren. R. Plunkett, Raymond F. Attner and Gemmy S. Allen, South Western College, 2007
9. Counseling and communication skills for medical and health practitioners. Edited by Rowen Bayne, Paula Nicolson and Ian Horton. Wiley-Blackwell, 1998.

5.5. Evidenced Based Practice and Research Module

[Person in Charge- Coordinator for EBPRM]

5.5.1. EBPRM Description

The aim of the module is to create knowledge, attitude and practice towards evidence-based practice, to learn research methodologies in relation to healthcare and to conduct and communicate a small scale undergraduate research as a small group of students.

Core aspects of teaching in research methods will be covered by the Department of Community and Family Medicine with contribution from other departments where applicable such as Department of Biochemistry on a brief introduction to laboratory research methods. The other component for the application aspect will be conducted by all the departments in the respective phases.

This module will also focus on enhancing the skills of the students to make them compatible to this era. This will include practical on use of MS Word for scientific writing, use of PowerPoint for dissemination of research, electronic literature search, use of reference manager software, data entry software and data analysis software.

Teaching Learning Processes

Fixed learning materials (e.g. video clips) in the VLE, journal clubs, computer based practical, carrying out their own research, debate, quiz and etc.

Journal club activities

This activity enhances the skill of interpreting a research communication. These will be conducted regularly in phase I, phase II and final year of the course and will consider articles based on the areas of regular study programme and of common issues of clinical relevance.

Implementation:

A module committee will run this module throughout the entire course. In all the phases (preclinical, para clinical and clinical) students will get skills in applying EBP in all subjects they learn in each phase. During the preclinical phase students will get orientation on evidence-based practice and foundation needed to understand a research communication. The additional skills students gain during para-clinical phase will be the hands-on skills in carrying out an undergraduate research and its dissemination. During clinical phase students will learn the application of EBP especially via interpreting research synthesis such as narrative reviews, systemic reviews, meta-analysis, and umbrella reviews and clinical practice guidelines.

5.5.2. Detailed syllabus

Term 1		
Hours	Mode of delivery	Topic
1	Discussion	Introduction to evidence based practice
2	Discussion	Introduction to terms used in research
1	Discussion	Introduction to journal club and critical appraisal of articles
3	Discussion	Journal clubs
Term 2		
2	Computer based practical/IT	Literature search
2	Computer based practical/IT	Use of reference manager
2	Computer based practical/IT	Use of MS word for academic work
1	Computer based practical/IT	Interpretation of tables and graph
2	Lecture	Research hypothesis, Type 1 and Type 2 errors, study designs
4	Lecture	Laboratory based research
3	Discussion	Journal clubs
Term 3		
1	Lecture	Descriptive studies
2	Lecture	Analytical studies
1	Lecture	Experimental studies
2	Lecture	Evidence synthesis - Systematic review and meta-analysis
3	Discussion	Journal clubs
Term 4		
1	Lecture	Ethics in research
1	Lecture	Qualitative research
3	Discussion	Journal clubs

Term 5		
2	Computer based practical	Introduction to Google class room
1	Lecture	Literature review
2	Discussion	Problem analysis and objectives
1	Lecture	Introduction to research -Background, rationale and objectives
2	Lecture	Sample size and sampling
2	Lecture	Data collection - Instruments and techniques
1	Lecture	Methodology in research
1	Lecture	Ethics in research
2	Lecture	Writing research proposal
6	Discussion	Discussion with supervisors
3	Discussion	Journal club

Term 6		
1	Lecture	Introduction to presenting research proposal
20	Presentation	Presenting research protocol to EBP module
10	Presentation	Presenting research protocol to ERC
6	Discussion	Journal club
Term 7		
2	Computer based practical	Data entry software
	Field work	Data collection
6	Discussion	Journal club
Term 8		
4	Computer based practical	Data analysis using software
6	Discussion	Journal club
Term 9		
6	Discussion	Journal club
Term 10		
2	Computer based practical	Writing results in research
2	Discussion	Writing discussion in research
2	Computer based practical	Preparing poster presentation
1	Lecture	Preparation of oral presentation
6	Discussion	Journal club
Term 11		
6	Discussion	Journal club
Final year		
1	Lecture	Clinical practice guidelines
1	Lecture	Clinical audit
10	Discussion	Journal club

Summary of Phase I

Activity	Term 1	Term 2	Term 3	Term 4	Total
Discussion/Group work	7	3	3	3	16
Lecture	-	6	6	2	14
Computer based practicals	-	7	-	-	07
Total	7	16	9	5	37

Summary of Phase II

Activity	Term 5	Term 6	Term 7	Term 8	Term 9	Term 10	Term 11	Total
Discussion/Group work	8	6	6	6	6	8	6	46
Lecture	10	1	-	-	-	1	-	12
Computer based practicals	2	-	2	2	-	4	-	10
Data collection/ Presentations	-	30	30	-	-	-	-	60
Total	20	37	38	8	6	13	6	128

5.5.3. Evaluation

Type of Examination			Distribution of Marks- First examination	Distribution of Marks- subsequent examinations	Details of evaluation
Phase I					
	Journal Clubs		10	-	Attendance at journal club
	Computer based practical*		40	50	
	Theory	MCQ	20	25	Qualifying mark is 45%
		SBR	20	25	
Phase II					
	Journal club		10	-	Attendance at journal club
	Research project**		35	35	
	Presentations		10	10	
	Theory	MCQ	15	20	Qualifying mark is 45%
		SBR	15	20	
	Computer Based practical*		15	15	

Assessment will have three subcomponents viz. theory based formative assessments, undergraduate research project-based assessments and journal clubs.

***Computer based practical assessments**

Preclinical phase – Literature search skills, use of reference manager software and use of MS Word for academic writing

Para-clinical phase: Developing data entry data base and analysis of data

****Undergraduate research project**

Undergraduate research will be carried out by a group of 5 or 6 students during the para-clinical phase. Logistic support in implementing undergraduate research project will be carried out by the Department of Community and Family Medicine. Activities of students in relation to oral and poster presentations will be coordinated by the Undergraduate Research Symposium committee.

Students' engagement will be monitored in the activities of proposal presentation, poster presentation in undergraduate research symposium, undergraduate research report and oral presentation in undergraduate research symposium.

Note: In assignments, presentations and research reports , students will be asked to repeat it until they get satisfactory level in each component

5.6. Anatomy

5.6.1. Description

Teaching-learning activities include lectures, cadaveric dissection and/or discussion with prosected specimens, histology practicals and tutorials. Students are encouraged to use prosected specimens and plastic models in the anatomy museum to understand the gross structure of the human body. A dissection guide is given to students as a guide for the dissection.

The dissection is facilitated by lecture on important aspects in the relevant region. The students perform dissection in groups with the help of dissection guide given to them well in advance, text books and atlas. Lecturers and / or demonstrators guide the dissection and there may be a short discussion at the end of dissection. Gross Anatomy tutorials are carried out in the relevant region with case scenarios. The embryology is taught through lectures and tutorials with the aid of videos and plastic models. Teaching, learning activities in histology is carried out through lectures, practicals and tutorials. Medical Genetics is taught through lectures and tutorials. Experts are invited to conduct discussions on applied anatomy including radiological anatomy.
In-course assessments are conducted at the end of each term. In addition an oral examination which carries no marks to the final examination may be conducted at the end of each term.

The subject contributes to outcome number 1, 2, 6, 8, 9 and 10 of the curriculum.

5.6.2. Objectives

The aim of the course is to develop adequate knowledge in gross and microscopic structure and, development of the human body to correlate with the clinical manifestations. At the end of the course the students should be able to,

- Outline the muscles of the body with regard to their attachments, actions, nerve supply and abnormalities due to nerve injury and testing the integrity of muscles
- Distinguish the bones with regard to ossification, muscles attached, joints and movements and understand the anatomical basis of clinical presentation due to common fractures and dislocation of joints etc. Outline the forensic significance of bones.
- Recall the structure, distribution and function of nervous system and relate them to clinical conditions.
- Relate each organ with regard to location, relations, blood supply, nerve supply and lymphatic drainage and relate them to clinical conditions.
- Recall the distribution of major vessels in the body and relate them with the clinical conditions.
- Make use of surface mark of the important organs and structures.
- Interpret the normal imaging.
- Recall the microscopic structure of tissues and organs in relation to their functions and identify them under the light microscope.

- Outline the fertilization and intrauterine development of foetus and correlate with the developmental malformations.
- Find the genetic basis of diseases.

5.6.3. Intended Learning Outcomes

Upper Limb

- Explain surface anatomy of bony prominence and their clinical importance.
- Define the cutaneous innervations /dermatomes of the arm, forearm and hand.
- Define the venous and lymphatic drainage of upper limb (both superficial and deep) and identifying potential veins for IV cannulation.
- Apply the anatomy of the breast including its lymphatic drainage and its considerable clinical importance of understanding clinical features of breast cancer.
- Apply the components of brachial plexus and applied anatomy of its injuries including Erb's palsy and Klumpke's palsy.
- Define the anatomy of axilla and its contents.
- Label the cubital fossa and its contents.
- Explain the anatomy of carpal tunnel, anatomical snuff box and their contents.
- Illustrate that each part the upper limb (arm, forearm, hand) has compartments formed by the deep fascia.
- Summarize the functions of muscles in each of the compartments of upper limb.
- Explain the rotator cuff and its clinical importance.
- Relate the anatomy of bones and joints of upper limb in relation to function and applied anatomy of their fractures and dislocation.
- Distinguish the innervation of each compartment and the specific deficits that occur with lesions of individual nerves at different parts along the course of each nerve.(Eg:wrist drop, claw hand, winging of scapula, Ulnar paradoxy etc.)
- Define the vascular pattern and major arteries.
- Compare and contrast intrinsic and extrinsic muscles of the hand and clinical anatomy of hand including infection of pulp spaces of digits, appreciating infection of thumb and little finger dangerous than other fingers.
- Define the bony components of the wrist and carpal tunnel and explaining anatomical basis for carpal tunnel syndrome.
- Identify upper limb anatomic structures in radiographic studies including X-ray, CT scans and MRI films.

Thorax

- Illustrate the bones and musculature of thoracic cage (ribs, thoracic vertebrae and intercostal muscles) and their clinical importance and application. Eg;- Rib fracture , intercostal tube insertion.
- Summarise the Anatomical structures located in the anterior , superior, middle and posterior mediastinum and correlate the clinical importance. (Hydro pneumothorax and mediastinal shift)
- Relate the trachea, pleural covering and lungs in related to their function and clinical importance.
- Illustrate the pericardium, heart and great vessels in relevant to the surface marking, and their clinical importance (Cardiac enlargement, pericardial effusion).
- Identify and describe the blood supply of heart in detail and their clinical importance. (coronary artery block)
- Distinguish the posterior mediastinal contents and their clinical importance. (Eg:- Thoracic esophagus malignant disease)
- Relate the lymphatic drainage of the whole thoracic cage including thoracic duct and their clinical importance.
- Summarise the diaphragm attachments, developmental abnormalities and the structures passing or entering through it and clinical importance
- Identify the anatomic structures in radiographic studies including X-ray , C-T scan and MRI .

Lower Limb

- Elaborate surface anatomy of bony prominence and their clinical importance.
- Explain the cutaneous innervations/dermatomes of the thigh,leg and foot and relevant clinical anatomy such as sciatica, meralgia paresthetica and nerve blocks.
- Define the venous and lymphatic drainage of lower limb (both superficial and deep) and knowing the clinical anatomy of venous cut down and varicose vein.
- Illustrate that each part the lower limb (gluteus, thigh, leg, foot) has compartments formed by the deep fascia and understanding compartment syndrome of lower limb.
- Identify femoral sheath and femoral canal and its contents, clinical anatomy relevant to femoral hernia.
- Summarize the functions of muscles in each of the compartments of lower limb.
- Apply actions of gluteus muscles and the Trendelenburg's sign.
- Distinguish the relationships of structures found in the femoral triangle.
- Explain gross anatomy of popliteal fossa, adductor canal and its contents.
- Apply the anatomy of bones and joints of lower limb in relation to function and applied anatomy of their fractures, dislocation (such as posterior hip dislocation, lateral patellar dislocation) , menisci injuries and ACL injury of knee joint.
- List the components and branches of the lumbar-sacral plexus.

- Apply the innervation of each compartment and the specific deficits that occur with lesions of individual nerves at different parts along the course of each nerve. (Eg:foot drop)
- Relate the vascular pattern and major arteries and describe the major anastomoses around each joint (cruciate anastomosis, trochanteric anastomosis etc) and surface marking of arteries for checking arterial pulse.
- Relate anatomy of foot, compare and contrast intrinsic and extrinsic muscles of the foot and clinical anatomy.
- Define the bony components of the ankle joint and foot and understanding arches of foot.
- Identify lower limb anatomic structures in radiographic studies including X-ray, CT scans, angiogram and MRI films.

Head and Neck

- Distinguish the bones of head and neck region and their clinical application
- Relate that the soft structures are related to bony and cartilaginous structures (e.g., the common carotid divides into external and internal branches at about the level of the hyoid bone which is at vertebral level C3).
- Recall that the cervical plexus has a sensory and a motor component.
- Demonstrate the branches of the external carotid artery and their distributions
- Relate arrangement of deep fascia of neck and their clinical application and recognize that the neck is compartmentalized as a series of tubes within tubes by deep fascia, recall these fasciae and what is transmitted within each compartment and explain the clinical importance of the retropharyngeal space.
- List the layers of scalp and cutaneous supply of face and relevant clinical anatomy (black eye, dangerous triangle of face etc.).
- Explain the triangles of neck and their clinical application.
- Apply the muscles in the face and their functions to clinical anatomy of facial nerve palsy
- Compare and contrast muscles of mastication with muscles of facial expression.
- Recall the contents of the infratemporal fossa and the relationships of structures found here.
- Illustrate gross anatomy of thyroid gland and its clinical anatomy relevant to thyroidectomy and understand thyroid moves with swallowing and anatomy of recurrent laryngeal nerve.
- Explain parotid, submandibular salivary glands and their clinical relevance including sandwich arrangement of parotid gland and skin incision 1 inch below mandibular margin.
- List the parts of the digestive and respiratory tracts in this region

- Apply the anatomy of nasal cavity, paranasal sinuses, oral cavity, pharynx, larynx to their clinical implication (bleeding after removal of palatine tonsil, foreign body in piriform fossa etc)
- List the contents of orbit and lacrimal apparatus and their clinical relevance
- Relate the anatomy of eye and ear and their clinical application
- Elaborate the great vessels, nerves, lymphatic drainage, joints of head and neck region and their applied anatomy
- Summarise the components and distribution of each cranial nerve.
- List each of the foramina in the skull and what traverses each.
- Demonstrate the dural projections in the cranial cavity and explain the formation of dural sinuses including carvernous sinus and its contents.
- Find anatomic structures in radiographic studies including X-ray, CT scans and MRI films
- Develop team work, communication skills and professionalism during the dissection

Abdomen

- Illustrate the anterior abdominal wall structures including neurovascular supply and lymphatic drainage and their clinical importance
- Elucidate the planes used to divide the abdomen into nine subdivisions and their clinical significance.
- Apply various surgical incisions and their clinical importance.
- Relate the inguinal canal, including boundaries, contents of inguinal canal and the male external genitalia and their clinical importance, (Eg:- Inguinal hernia , undescended testis etc.)
- Identify the peritoneal folds, reflection, compartments, recess, gutters and pouches of peritoneal cavity and their clinical importance.
- Explain the gross structures of stomach , duodenum, jejunum ,ilium, and large intestine with their blood supply and lymphatic drainage and correlate the clinical aspects of the malignant and benign disease and developmental abnormalities of above mentioned structures.
- Explain the liver and its segments with vascular supply and lymphatic drainage.
- Demonstrate biliary (intra and extrahepatic) system with their anatomical location, blood supply and lymphatic drainage and their clinical importance.
- Demonstrate pancreas with it's anatomical location, blood supply and lymphatic drainage and their clinical importance.
- Relate the kidneys, ureters, and adrenal glands with their clinical importance.
- Explain the posterior abdominal wall with blood vessels including lumbar venous plexus, autonomic nerves and their clinical importance.
- Apply the lumbar vertebrae and their clinical importance to weight bearing
- Demonstrate all portosystemic anastomosis in the abdominal cavity.
- Identify the anatomical structures in X-rays , contrast radiography, C.T scan and

MRI

- Apply the macroscopic appearance and anatomical location of the abdominal viscera in identifying the organs during laparoscopic examinations.

Pelvis and Perineum

- Explain the surface anatomy of bony prominence with their clinical importance.
- Apply the anatomy of joints between lumbar vertebrae, sacrum, and pelvis for weight bearing and birth process with the clinical co-relations.
- Distinguish the male and female pelvis with their clinical correlations.
- Apply the abdominal fascia extending to external genitalia and to upper thigh and its clinical importance.
- Distinguish male and female pelvic viscera and perineal structures and their clinical importance.
- Explain the anatomy, blood supply, lymphatic drainage, nerve supply of the rectum and anal canal with their clinical importance. (Haemorrhoides, Incontinence of faeces)
- Apply the anatomy and relationship of pelvic organs bladder prostrate, uterus, ovary, pelvic ureter with their clinical importance.
- Distinguish the anatomical differences between the female and male urethra and it's clinical importance.
- Explian the sphincter control of urinary system and the clinical importance (sphincter injuries).
- Elucidate the pelvic diaphragm and urogenital diaphragm supporting pelvic and perineal structures and its clinical importance.
- Demonstrate the peritoneal folds, fascia and pouches in the pelvic cavity and their clinical importance (Waldeyer's fascia, Denon vellier's fascia, pouch of Douglas and mesorectum).
- Apply neurovascular and lymphatic drainage of pelvic cavity and perineum and their clinical importance (aorta iliac block, pudendal nerve block, retrograde flow to lumber venous plexus and malignant lymphatic spread of pelvic organs)
- Relate the digital vaginal and digital rectal examination in a normal person and able to differentiate in abnormal conditions.
- Identify pelvic and perineal structures in radiographic studies including X-ray. CT scans, and MRI

Histology

- Identify the structure of cell membrane and organelles and its functions
- Distinguish the types of cell divisions and its significance
- Identify the different types of skin under the light microscope
- Define the characteristic features of three types of muscle and identify them under the light microscope

- Elaborate the characteristic features of different types of epithelium and identify them under the light microscope
- Define the characteristic features of connective tissue, cartilage, bone and nerve tissue and identify them under the light microscope
- Identify the structure and function of each organ in the immune system and identify them under the microscope
- Illustrate each structure in the respiratory system for its effective function and identify them under the light microscope
- Elaborate the characteristic features of different types of vessels and identify them under the light microscope
- Identify the structure and function of each organ in the endocrine system and identify them under the microscope
- Illustrate the common structure of digestive tract and identify the different organs under the microscope by their characteristic features
- Identify the microscopic features of salivary glands, liver, gall bladder and pancreas
- Recall the structure and function of each organ in the urinary system and identify them under the microscope
- Explain the structure and function of each organ in the male reproductive system and identify them under the microscope
- Distinguish the structure and function of each organ in the female reproductive system and identify them under the microscope

Embryology

- Elaborate the ovulation and fertilization
- Relate normal implantation site and abnormal implantation sites
- Distinguish the structures develop from each germ layer-ectoderm, mesoderm and endoderm
- Explain the placenta formation and know its anomalies
- Summarise the development of musculoskeletal system and know the abnormalities
- Explain briefly the development of body cavities and the structures participate in the formation of diaphragm
- Illustrate the development of respiratory system and know the developmental abnormalities
- Summerise the different periods in the development of lung
- Recall the development of cardiovascular system and know the developmental abnormalities
- Illustrate the derivatives of pharyngeal arches, pouches and clefts during the development
- Elucidate the development of tongue, thyroid gland, face and palate and its anomalies

- Distinguish the development of digestive system and know the developmental abnormalities
- Summarise the development of urinary system and know the developmental abnormalities
- Distinguish the development of male and female reproductive systems and correlate with the developmental abnormalities

Medical Genetics

- Relate the ethical issues in genetics and genetic services in Sri Lanka
- Illustrate the chromosome, chromosomal abnormalities and their detection
- Apply the genetic variations and their clinical importance
- Apply medical genetics in knowing cancer, pharmacogenetics, and prevention of genetic diseases
- Illustrate the pattern of inheritance and pedigree analysis

5.6.4. Detail Syllabus

General Anatomy Lectures – Introductory period (5 hrs)		
Topic	**Activity**	**Duration**
Introduction to learn Anatomy	Lecture 1	1
Skin, fascia and muscles	Lecture 2	1
Cartilages, bones and Joints	Lecture 3	1
Lymphatic and vascular system	Lecture 4	1
Nervous system	Lecture 5	1

Term 1		
Gross Anatomy - Upper limb		
Topic	**Activity**	**Hrs**
Osteology of upper limb Introduction, Ethics in dissection, osteology of the upper limb	Lecture 1,2	2
	Small group discussion (SGD)	6
Pectoral region and breast	Lecture 3	1
	Dissection / Learning through prosected specimen (LPS)	2
Axilla and its contents	Lecture 4	1
	Dissection / LPS	3
back of trunk ,Scapular region and scapulothoracic movements	Lecture 5	1
	Dissection / LPS	2
Arm&Cubital fossa	Lecture 6	1
	Dissection /LPS	3
Joints of shoulder girdle	Lecture 7	1
	Dissection /LPS	2
Flexor and Extensor compartments of Forearm	Lecture 8	1
	Dissection /LPS	2
Elbow joint & radioulnar joint	Lecture 9	1
	Dissection /LPS	2
Wrist and Carpal tunnel	Lecture 10	1
	Dissection /LPS	2
Hand anatomy- intrinsic muscles , long flexor tendons and neurovascular structures	Lecture 11	1
Hand anatomy- spaces of hand	Lecture 12	1
	Dissection /LPS	3
Hand anatomy- joints of hand	Lecture 13	1
	Dissection /LPS	2
Summary –innervation, blood supply and lymphatic drainage of upper limb	SGD	3

Surface Anatomy, Testing the integrity of muscle, interpretation of radiographs	SGD	3
Gross Anatomy including case scenarios	Tutorial	8x2
Clinical / Applied Anatomy		
Breast & Pectoral region	Lecture 1	1
Axilla and Brachial plexus	Lecture 2	1
Innervation and Vasculature of Upper limb	Lecture 3	1
Bones and joints of Upper Limb	Lecture 4, 5	2
Hand	Lecture 6	1
Introduction to imaging	Lecture 1	1
Radiology	Lecture 2	1
Histology		
Structure of Cell	Lecture 1	1
Cell division and cell cycle	Lecture 2	1
Skin Muscle	Lecture 3	1
Skin and muscle	Practical 1	2x2
Epithelium	Lecture 4	1
Epithelium	Practical 2	2x2
Connective tissue, Cartilage and bone	Lecture 5	1
Connective tissue, Cartilage and bone	Practical 3	2x2
Nervous tissue	Lecture 6	1
Nervous tissue	Practical 4	2x2
Histology	Tutorials	2x2
Embryology (Including video aided teaching)		
Ovulation, fertilization and Implantation	Lecture 1	1
Embryonic period	Lecture 2	1
Placenta	Lecture 3,4	2
Fetal period	Lecture 5	1
Development of musculoskeletal system	Lecture 6,7	2
Embryology	Tutorials	2x2
Medical Genetics		
Introduction to medical genetics, ethical issues in genetics and genetic services in Sri Lanka	Lecture 1	1
Chromosome, chromosomal abnormalities and their detection	Lecture 2,3,4	3
Medical Genetics	Tutorial	1
In Course Assessment- I		2
Term 2		
Gross Anatomy - Thorax		
Topic	**Activity**	**Duration**
Thoracic wall: Bony thoracic cage	Lecture 1	1
	SGD	5
	Lecture 2	1

Thoracic wall: Intercostal, muscles, innervation, blood supply and lymphatic drainage	Dissection /LPS	5
Pleura and lungs	Lecture 3	1
	Dissection /LPS	5
Mediastinum: Superior mediastinum and Anterior mediastinum	Lecture 4	1
	Dissection /LPS	5
Middle mediastinum: pericardium and chambers Middle mediastinum : blood supply, conduction system and lymphatic drainage	Lecture 5	1
	Dissection /LPS	6
Posterior mediastinum	Lecture 6	1
	Dissection /LPS	5
Review: Surface anatomy, interpretation of radiographs & images	Lecture 7	1
	SGD	3
Gross Anatomy including case scenarios	Tutorial	5x2
Clinical / Applied Anatomy		
Thoracic wall	Lecture 1	1
Mediastinum	Lecture 2	1
Lungs	Lecture 3	1
Heart	Lecture 4	1
Radiology	Lecture 3	1
Gross Anatomy - Lower limb		
Osteology of the lower limb	Lecture 1	1
	SGD	6
Femoral triangle, Anterior and medial aspects of the thigh	Lecture 2	1
	Dissection /LPS	3
Hip joint, Gluteal region and posterior aspect of the thigh	Lecture 3	1
	Dissection/LPS	5
Knee joint, Popliteal fossa and back of the leg	Lecture 4	1
	Dissection /LPS	5
Anterior and lateral aspects of the leg and dorsum of the foot and sole of the foot	Lecture 5	1
	Dissection /LPS	6
Tibiofibular joints, ankle joint and joints of the foot	Lecture 6	1
	Dissection /LPS	3
Nerves and vessels of lower limb Surface Anatomy, Testing the integrity of muscle and, interpretation of radiographs	Lecture 7	1
	SGD	3
Gross Anatomy including case scenarios	Tutorial	5x2
Clinical / Applied Anatomy		
Femoral triangle, Popliteal fossa and compartments of the legs	Lecture 1	1
Innervation and Vasculature of Lower limb	Lecture 2	1
Bones and joints of Lowe Limb	Lecture 3,4	2
Foot	Lecture 5,6	2
Radiology	Lecture 4	1
Histology		
Immune system	Lecture 1	1

Immune system	Practical 1	1.5x2
Respiratory system	Lecture 2	1
Cardiovascular system	Lecture 3	1
Respiratory and Cardiovascular system	Practical 2	2x2
Histology	Tutorial	1x2
Embryology(Including video aided teaching)		
Development of body cavities and diaphragm Development of Respiratory system	Lecture 1	1
Development of cardiovascular system	Lecture 2,3	2
Embryology	Tutorial	1x2
Medical Genetics		
Gene and genetic variations and their clinical importance	Lecture 1,2	2
Detection of genetic variations	Lecture 3	1
Medical Genetics	Tutorial	1x2
In Course Assessment –II		2

Term 3		
Gross Anatomy - Head and neck		
Topic	**Activity**	**Duration**
Osteology of Head and Neck	Lecture 1	1
	SGD	6
Deep fasciae and muscles of the neck	Lecture 2	1
	Dissection /LPS	3
Triangles of the neck	Lecture 3	1
	Dissection /LPS	6
Thyroid gland and Face and scalp	Lecture 4	1
	Dissection /LPS	3
Parotid gland and Cranial cavity	Lecture 5	1
	Dissection /LPS	3
Submandibular region, Infratemporal region and temperomandibular joint	Lecture 6	1
	Dissection /LPS	3
Orbit and lacrimal apparatus	Lecture 7	1
	Dissection /LPS	3
Nasal cavity and Deep structures of the back of the neck and the trunk	Lecture 8	1
	Dissection/LPS	3
Larynx soft palate, pharynx and oral cavity	Lecture 9	1
	Dissection /LPS	3
Eye and Ear	Lecture 10	1
	Dissection /LPS	3
Nerves, blood vessels, lymphatics and lymph nodes of head and neck	Lecture 11	1
	Dissection /LPS	6
Gross Anatomy including case scenarios	Tutorial	7x2

Clinical / Applied Anatomy		
Triangles of the neck & Cervical Fascia	Lecture 1	1
Salivary glands	Lecture 2	1
Orbit and eye	Lecture 3	1
Osteology and Head and Neck	Lecture 4	1
Vasculature and lymphatic	Lecture 5	1
Larynx, Pharynx and Ear	Lecture 6	1
Radiology	Lecture 5	1
Histology		
Endocrine system	Lecture 1	1
Endocrine system	Practical 1	2x2
Embryology(Including video aided teaching)		
Pharyngeal arches , pouches, clefts and their derivatives	Lecture 1	1
Development of tongue & thyroid gland	Lecture 2	1
Development of face, nasal cavity & palate	Lecture 3	1
Embryology	Tutorial	1x2
Medical Genetics		
Special topics on medical genetics including cancer, pharmacogenetics, prevention of genetic diseases, ,and introduction to common genetic tests	Lecture 1,2,3	3
Medical Genetics	Tutorial	1x2
In Course Assessment- III		2

Neuroanatomy is included along with Physiology curriculum as Neurology module

Term 4.		
Gross Anatomy - Abdomen		
Topic	**Activity**	**Duration**
Anterior abdominal wall: planes, subdivision, arrangement of rectus sheath, blood, nerve supply and lymph drainage and outline of surgical lincisions	Lecture 1	1
	Dissection/SGD	5
Inguinal canal: boundaries, contents and inguinal hernia	Lecture 2	1
	Dissection /LPS	3
Abdominal cavity, peritoneal folds and compartments	Lecture 3	1
	Dissection /LPS	5
Stomach, jejunum, ileum and large intestine	Lecture 4	1
	Dissection /LPS	5
Liver and biliary apparatus	Lecture 5	1
	Dissection /LPS	5
Pancreas, duodenum, and spleen	Lecture 6	1
	Dissection /LPS	5
Kidneys, ureters and suprarenal glands	Lecture 7	1
	Dissection /LPS	5
Lumbar vertebra, posterior abdominal wall and diaphragm	Lecture 8	1
	Dissection /LPS	5
Posterior abdominal wall vessels, lumbar plexus and autonomic nerves of abdomen	Lecture 9	1
	Dissection /LPS	5
Review: Surface anatomy, interpretation of radiographs and images	Lecture 10	1
	SGD	3
Gross Anatomy including case scenarios	Tutorial	6x2
Clinical /Applied Anatomy		
Anterior abdominal wall & Inguinal Region	Lecture 1	1
Peritoneal cavity and peritoneal reflections	Lecture 2	1
Gastro Intestinal Tract	Lecture 3	1
Hepatobiliary system and Pancreas	Lecture 4	1
Posterior abdominal wall and diaphragm	Lecture 5	1
Urinary system	Lecture 6	1
Radiology	Lecture 6	1
Gross Anatomy - Pelvis and Perineum		
Bony Pelvis	Lecture 1	1
	SGD	2
Muscles of pelvic wall, pelvic diaphragm, pelvic peritoneum and pelvic fascia	Lecture 2	1
	LPS / plastic model	3
Male reproductive system	Lecture 3,4	2
	Dissection /LPS	3
Female reproductive system	Lecture 5,6	2
	Dissection /LPS	3

Sigmoid colon and Rectum	Lecture 7	1
	Dissection /LPS	2
Neurovascular structures – pelvis	Lecture 8	1
	Dissection / LPS	3
Perineum - anal triangle	Lecture 9	1
	Dissection/LPS	2
Perineum – Male and female urogenital triangle	Lecture 10,11	2
	Dissection /LPS	3
Surface anatomy, interpretation of radiographs and special radiological techniques and imaging	Lecture 12	1
	SGD	3
Gross Anatomy including case scenarios	Tutorial	4x2
Clinical / Applied Anatomy		
Rectum and anal canal	Lecture 1	1
Male reproductive system , Testes and scrotum	Lecture 2	1
Female reproductive system	Lecture 3	1
Bony pelvis and Perineum	Lecture 4	1
Radiology	Lecture 7	1
Histology		
Gastrointestinal system	Lecture 1	1
Gastrointestinal system	Practical 1	2x2
Glands associated with Gastrointestinal system	Lecture 2	1
Glands associated with Gastrointestinal system	Practical 2	1 x2
Urinary system	Lecture 3	1
Urinary system	Practical 3	1x2
Male reproductive system	Lecture 4	1
Male reproductive system	Practical 4	1.5x2
Female reproductive system	Lecture 5	1
Female reproductive system	Practical 5	2x2
Histology	Tutorial	2x2
Embryology (Including video aided teaching)		
Development of Digestive system	Lecture 1,2	2
Development of urinary system	Lecture 3	1
Development of Male and female reproductive systems	Lecture 4,5	2
Embryology	Tutorial	2x2
Medical Genetics		
Pattern of inheritance, pedigree analysis and special topics on medical genetics including consanguinity, dermatoglyphics, genetic counseling	Lecture 1,2,3,4	4
Medical Genetics	Tutorial	1x2
In Course Assessment- IV		2

5.6.5. Summary

Anatomy					
Activity **Lectures**	Term I	Term II	Term III	Term IV	Total
General Anatomy –introductory -5hrs					5
Gross Anatomy	13	14	28	22	77
Applied anatomy	6	10	8	10	34
Histology	6	3	3	5	17
Embryology	7	3	8	5	23
Radiology	2	2	1	2	7
Genetics	4	3	3	4	14
Total Lectures –introductory- 5	**38**	**35**	**51**	**48**	**177**
Practical					
Dissection / learning through prosected specimen (LPS)	23	48	46	57	174
Small group discussion (SGD)	12	17	6	13	48
Histology	8	3.5	6	7.5	25
Total Practical	**43**	**68.5**	**58**	**77.5**	**247**
Tutorial					
Histology	2	1	1	2	6
Embryology	2	1	3	2	8
Gross Anatomy	8	10	13	10	41
Genetics	1	1	1	1	4
Total Tutorial	**13**	**13**	**18**	**15**	**59**
In Course Assessment	**2**	**2**	**2**	**2**	**8**
Total Hours5	**96**	**118.5**	**129**	**142.5**	**491**

5.6.6. Evaluation of students

Anatomy					
Type of Examination		Distribution of Marks- First examination	Distribution of Marks- subsequent examinations	Details of evaluation- duration, number of questions. ect.	Qualifying pass marks (%)
1	Incourse Assessment	20		4In course assessments	
2	End of course:	80	100		
2.1	M.C.Q.	25	35	40 Multiple response and 20 single response questions – 3 hrs	45% in Essay & M.C.Q.
2.2	Essay	25	35	10 Structured essay questions – 3 hrs	
2.3	Gross Spots (OSPE)	15	15	Gross Anatomy- 20 x 2 min	
2.4	Histology spots (OSPE)	5	5	Histology – 10 x 2 min	
2.5	Viva	10	10	5 min / student /panel- two panels (total of 10 minutes)	

5.6.7. References

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4. Young, B., Woodford, P. and O'Dowd, G., 2013. *Wheater's functional histology: A Text and colour atlas*. 6th edition, Edinburgh: Churchill Livingstone.

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2. Junqueira, L.C. and Mescher, A.L., 2018. *Junqueira's Basic histology: Text and atlas,* 15th edition, New York: McGraw-Hill .

3. Wineski E.L.,2018.*Snell's clinical anatomy by regions*.10th edition, Lippincott Williams & Wilkins.

4. Chaurasia, B.D., 2004. *Human anatomy*.8th edition, CBS Publisher.

5. Drake, R., Vogl, A.W. and Mitchell, A.W., 2019. *Gray's Anatomy for Students. 4th edition,* Elsevier health sciences.

5.6.8.Neurology Module

This is a combined module of Neuro anatomy and Neurophysiology done at **term 3**

Topic	Activity	Department	Time (Hr)
Introduction and Over View	Lecture	Physiology	1
Hstology of CNS	Lecture	Histology	1
Histology of CNS	Practical	Histology	2x2
Development of Nervous system	Lecture	Embryology	3
Cranial cavity, meninges and venous sinouses	Lecture	Anatomy	2
Ventricles of the brain	Lecture	Anatomy	1
CSF	Lecture	Physiology	1
Spinal cord	Lecture	Anatomy	1
Development of fetus, reflex and conscious movement	Video	Physiology	1
Peripheral and Autonomic Nervous system	Lecture	Anatomy	1
Sensory system- receptor mechanism	Lecture	Physiology	1
Sensory system- sensory pathway	Lecture	Physiology	1
Pain and visceral sensation	Lecture	Physiology	1
Brain	Dissection	Anatomy	10
Brain stem- External features	Lecture	Anatomy	1
Brain stem- internal structure	Lecture	Anatomy	1
Brain stem- tracts	Lecture	Anatomy	1
Lower Motor system	Lecture	Physiology	1
Cerebellum	Lecture	Anatomy	1
Diencephalon	Lecture	Anatomy	1
Cerebral hemispheres- surface features and cortical areas	Lecture	Anatomy	1
Cerebral Cortex- Higher functions	Lecture	Physiology	1
Cortical Motor function	Lecture	Physiology	1
Internal structure of cerebral hemisphere- Basal Ganglia and white matter (commisural, association and projection fibers)	Lecture	Anatomy	1
Cerebellum, Basal Ganglia	Lecture	Physiology	1
Evaluation of peripheral Nervous system	Practical	Physiology	3x2
Thalamus and hypothalamus	Lecture	Physiology	1
Posture	Lecture	Physiology	1
Evoked Potential and Reaction time	Practical	Physiology	3x2
Limbic System	Lecture	Anatomy	1
Limbic system	Lecture	Physiology	1
Blood supply of the CNS	Lecture	Anatomy	1
Sleep	Video	Physiology	0.5

Sleep and arousal	Lecture	Physiology	2
Development of the eye	Lecture	Embryology	1
Development of the ear	Lecture	Embryology	1
Special Sense Organs	Lecture	Histology	1
Special Sense Organs	Practical	Histology	2x2
Eye: optics	Lecture	Physiology	1
Eye retina and nerves.	Lecture	Physiology	1
Optic Pathway	Lecture	Anatomy	1
Vision- applied aspects	Lecture	Physiology	1
Examination of the Eye	Practical	Physiology	3x2
External, middle and internal ear	Lecture	Anatomy	1
Hearing	Lecture	Physiology	1
Vestibule.	Lecture	Physiology	1
Olfactory and taste path way	Lecture	Anatomy	1
Taste and smell	Lecture	Physiology	1
Test of hearing, taste and smell	Practical	Physiology	3x2
Applied Anatomy	Lecture	Anatomy	2
Physiology Tutorial	Tutorial	Physiology	7
Anatomy Tutorial	Tutorial	Anatomy	6
Histology Tutorial	Tutorial	Histology	1
Embryology Tutorial	Tutorial	Embryology	2

5.7. Biochemistry

[Person in Charge- Head Biochemistry]

5.7.1. Intended Learning Outcomes

- Illustrate structure, functions and organization of biomolecules and their derivatives in cells and sub-cellular compartments and deviations under diseased conditions.
- Apply the basis and clinical aspects of enzymology and the alterations in enzymes and levels in disease conditions. Clinical applications of enzyme inhibition, therapeutic applications and enzyme inhibitors in management of patients.
- Apply functions and metabolism of haemoglobin and the causes and conditions leading to abnormalities of haemoglobin metabolism and tests to identify the abnormalities.
- Relate metabolism of carbohydrates, lipids, eicosanoids, amino acids and nucleic acids and alterations in metabolism under diseased conditions.
- Distinguish biochemical basis of acid base balance and the buffers in the body fluids.
- Apply the life cycle nutrition in health and disease.
- Elucidate Immune responses.
- Elaborate inheritance and molecular basis of hereditary diseases.
- Apply the principles of several conventional and specialized laboratory investigations, analysis, interpretation of data and to confirm the clinical diagnosis

Teaching Learning Process

All teaching-learning activities are designed to stimulate student participation and promote individual and group learning.

Teaching-learning activities include lectures (interactive classroom lectures) to facilitate the understanding of the basic principles and concepts.

Tutorials classes would include the problem based small group discussions, question-answer sessions, revision and reinforcement of difficult concepts.

Practical classes include few demonstrations, individual student practical and group practical to substitute and clarify the theoretical concepts with experimental evidences and to develop familiarity with the available biochemical analysis including clinical discussions by practicing chemical pathologists and physicians.

The assessment methods involve in-course and end of course assessments. The in- course assessments include marks given to examinations conducted during the course. Formative in-course assessments are conducted at the end of each term. After each in-course examination, the answers will be discussed with the students.

5.7.2. Detailed Syllabus

Term I		
Biologically Important Carbohydrates (2 Hours)		
1	Lecture.	Biologically important monosaccharides and disaccharides derivatives.
1	Lecture.	Biologically important homo- and hetro-polysaccharides and clinical applications
Important Lipids for Medicine (4 Hours)		
1	Lecture.	Biologically important lipids and their components
1	Lecture	Phospholipids and other lipid derivatives
1	Lecture	Lipid storage disease due to different causes
1	Lecture	Sterols and biochemically important derivatives of steroids in human system
Amino acids, peptides and proteins for human system related to health and diseases (7 Hours)		
1	Lecture	Essential and non –essential amino acids and their properties and requirements
1	Lecture	Structures of insulin, α-keratin & β-keratin, collagen
1	Lecture	Structures of elastin, fibronectin, laminine
1	Lecture	Muscle proteins, contraction cycle and energy utilisation
1	Lecture	Functions and origin of different plasma proteins
1	Lecture	Clinical conditions altering the plasma proteins,
1	Lecture	Properties of proteins
3x2	Practical	Qualitative analysis of macromolecules
3x3	Practical & CD	Serum electrophoresis
3x3	Practical & CD	Estimation of serum proteins
1x2	Tutorial / SGD	Protein
Transport of molecules through cell membranes and clinical importance (2 Hours)		
1	Lecture	Movement of substances by different mechanisms
1	Lecture	Glucose transporters of physiological and clinical significance

Disorders in digestion and absorption of food (2 Hours)		
2	Lecture	Carbohydrate, proteins and lipids
Gene expression (3 Hours)		
1	Lecture	DNA repair diseases
1	Lecture	Gene expression and regulation
1	Lecture	Transcription and translation and post-translational modification of proteins
1x2	Tutorial / SGD	Gene
Immunoglobulins (3 Hours)		
1	Lecture	Immune response, innate and acquired immunity.
1	Lecture	Structure and function of immunoglobulin
1	Lecture	HIV, Autoimmune diseases, immune malignancy
1x2	Tutorial / SGD	Immunoglobulins
In - Course Assessment – 1 (23 h)		
Term II		
Vitamins (7 Hours)		
3	Lecture	Fat soluble vitamins
4	Lecture	Water soluble vitamins
3x2	Practical	Estimation of Urinary excretion of Vitamin C
2x2	Tutorial SGD	Vitamins
Biochemical basis iron metabolism and diseases (2 Hours)		
1	Lecture	Iron requirements, absorption, transport, storage and utilization
1	Lecture	Iron deficiency anaemia, different causes of anaemia, iron overload, biochemical
2x 3	Practical & CD	Estimation of Ferritin
Haemoglobin (8 Hours)		
1	Lecture	Haemoglobin types, oxygen dissociation curves and biochemical basis for
1	Lecture	Qualitative haemoglobinopathies,
	Lecture	Quantitative haemoglobinopathies and different tests available for the
1	Lecture	Synthesis of haemoglobin
	Lecture	Alterations in haem biosynthesis such as in lead poisoning, enzyme deficiencies
	Lecture	Catabolism of haem
	Lecture	Hyperbilirubinemias and different types of jaundices
	Lecture	Tests to confirm hyperbilirubinemias and different types of jaundices
4x2	Practical & CD	Bile and blood and Estimation of serum bilirubin level
2x2	Tutorial/ SGD	Haemoglobin
Bioenergetics (3 Hours)		
1	Lecture	Generation of energy
1	Lecture	Poison, Ionophores, inhibitors, uncouplers disturbing energy production
1	Lecture	Reactions involving oxygen in the body

Minerals (6 Hours)		
1	Lecture	Iodine and thyroid hormone synthesis. Biochemical actions of thyroid hormone.
1	Lecture	Alterations in metabolism due to hyper- and hypo-thyroidism Test for thyroid function
1	Lecture	Different Test for thyroid function and interpretation of the results
1	Lecture	Calcium homeostasis, relationship with bone metabolism and alterations in serum enzymes and other elements in serum
1	Lecture	Zinc and Copper related to biochemical reactions and leading deficiency diseases
1	Lecture	Chromium, Selenium & fluorine related to biochemical reactions and leading deficiency diseases
3x2	Practical & CD	Estimation of serum calcium
3x2	Tutorial/ SGD	Mineral metabolism
In-course Assessment – 2 (26 h)		

Term III		
Carbohydrate Metabolism and biochemical basis of the related disorders (16 Hours)		
1	Lecture	Introduction to Metabolism and recall Glycolysis & Tricarboxylic acid cycle
1	Lecture	Recall Glycolysis & Tricarboxylic acid cycle
1	Lecture	Control of Glycolysis and Tricarboxylic acid cycle
1	Lecture	Hexose Mono phosphate pathway and significance, Metabolism of fructose and galactose
1	Lecture	Metabolism of fructose and galactose
1	Lecture	Glycogen metabolism
		Control of glycogen metabolism and glycogen storage diseases
1	Lecture	Gluconeogenesis and control
1	Lecture	Alcohol metabolism in different levels of alcohol consumers and lactic acidosis
1	Lecture	Blood glucose maintenance and role of hormones in blood glucose maintenance. Summary of role of different organs in glucose homeostasis (intestine, pancreas, kidney, liver, etc.)
1	Lecture	Different types of diabetes and causes of diabetes, including metabolic syndrome, obesity, etc.
1	Lecture	Insulin resistance, Causes of insulin resistance, insulin measurements, acanthosis nigricans, etc.
1	Lecture	Alteration in metabolism in different organs such as in liver, eye, kidney and neurons in diabetes
1	Lecture	Biochemical basis of its complications and measurement of different blood and urine parameters related to diabetes
1	Lecture	Glucose tolerance test under different situations and physiological conditions and abnormal glucose tolerance curves
1	Lecture	Aspects of acid base balance and involvement of different biomolecules and organs in the maintenance of acid base balance
3x2	Practical & CD	Estimation of blood glucose level
3x2	Practical & CD	Estimation of Insulin
4x2	Tutorial / SGD	Carbohydrate metabolism
Nucleic acid metabolism (3 Hours)		
1	Lecture	Biosynthesis of purines and pyrimidines, Purine salvage pathway
1	Lecture	Diseases associated with nucleic acid metabolism.
1	Lecture	Cancer chemotherapeutic agents, Severe combined immune-deficiency disease and gene therapy.
1x2	Tutorial /SGD	Nucleic Acid Metabolism
Metabolism Amino acid and biochemical basis of the related disorders(8 Hours)		
1	Lecture	Transamination, amino acid oxidases and deamination reactions
1	Lecture	Ammonia homeostasis and biochemical basis of the detoxification of ammonia by different organs with special emphasis on brain

1	Lecture	Ammonia homeostasis and biochemical basis of the detoxification of ammonia by different organs with special emphasis on brain
1	Lecture	Biochemical importance of amino acid derivatives
1	Lecture	Metabolism of aromatic amino acids
1	Lecture	Metabolism of sulphur containing amino acids
1	Lecture	Molecular diseases in amino acid metabolism
1	Lecture	Biochemical useful to be measured for liver and kidney functions related to altered amino acid metabolism
3x2	Practical & CD	Estimation of serum urea and interpretations on BUN level
2x2	Tutorial / SGD	Amino acid metabolism
Eicosanoids (2 Hours)		
1	Lecture	Biochemically important eicosanoids and functions of eicosanoids
1	Lecture	Effects of steroidal and non-steroidal drugs as well as dietary fats on the effects
In-course Assessment-3 (29 h)		

Term IV		
Lipid Metabolism and biochemical basis of the related disorders (10 Hours)		
1	Lecture	Blood lipids, apoproteins and transport of lipids
1	Lecture	Metabolism of blood lipids
1	Lecture	Hyper- and hypo-lipoprotenemias causes for the conditions and biochemical tests and their results under such conditions
1	Lecture	Differences in lipid metabolism in various organs
1	Lecture 5	Metabolism of fatty acids and fatty liver
1	Lecture	Metabolism of ketone bodies and biochemical basis of ketoacidosis
1	Lecture	Cholesterol homeostasis
1	Lecture	Factors affecting cholesterol homeostasis including homocysteine & vitamin D
1	Lecture	Errors in lipid metabolism and metabolic syndrome
1	Lecture	Errors in lipid metabolism
3x2	Practical & CD	Determination of lipid profile and interpretation of the results
3x2	Tutorial / SGC	Lipid metabolism
Serum enzymes of diagnostic value (3 Hours)		
1	Lecture	Plasma specific enzymes
1	Lecture	Plasma non-specific enzymes
1	Lecture	Alteration in enzymes and proteins in myocardial infarction,
3x2	Practical & CD	Estimation of ALT
3x2	Practical & CD	Analysis of normal constituents in urine
3x2	Practical & CD	Analysis of abnormal constituents in urine
Foods of plant and animal origin (3 Hours)		
1	Lecture	Milk, Egg ,meat ,and fish
1	Lecture	Cereal, Legumes Roots and tubers and vegetables
1	Lecture	Nuts oils, and dietary fibres
2x2	Tutorial	Foods
Principles of Nutrition (13 Hours)		

1	Lecture	Principles of nutrition and nutrient requirements
1	Lecture	BMR and Total Energy Expenditure
1	Lecture	Requirements of carbohydrates , fats and proteins
1	Lecture	Requirements of proteins and calculation, quality of proteins, supplementary
5	Lecture	Preconception nutrition, Nutrition during pregnancy, Nutrition during lactation, Infant nutrition, Toddler and preschooler nutrition, Child and adolescent nutrition, Adult nutrition, Nutrition and older adults
1	Lecture	Nutrition for sportsmen
1	Lecture	Malnutrition
1	Lecture	Dietary guidelines and nutrition therapy for: diabetes, coronary heart disease, hypertension, stroke, dyslipidemia
1	Lecture	Healthy Plate, DASH, ketogenic diet, Atkins diet
2x2	Tutorial	Nutrition
Genes and human diseases (2 Hours)		
1	Lecture	Monogenic diseases
1	Lecture	Introduction to Genes and non-communicable diseases Cancer, Diabetes and cardiovascular disease
In Course Assessment -4 (31h)		

5.7.3. Summary

Biochemistry					
Activity	**Term**				**Total**
	I	**II**	**III**	**IV**	
Lecture (h)	23	26	29	31	109
Practical/ Clinical Discussion (h)	10	10	8	12	40
Tutorial / SGC (h)	3	7	7	5	22
In-Course Assessment (No.)	1	1	1	1	4
Total	**36**	**43**	**44**	**48**	**171h**

5.7.4. Evaluation

Types of Examination		Distribution of Marks (%)		Details of Evaluation	Qualifying Pass Marks
		Examination			
		First	Second		
In-course Assessment		30	NA	4 Assessments, Each of 1h duration	NA
End of Course	**MCQ**	25	40	60 Questions 3h Duration	45% in Theory
	Essay	25	40	10 Questions 3 h Duration	
	Practical	10	10	45 Minutes	
	Viva	10	10	10min / Student	

NA- Not Applicable

5.7.5. References

1. **Textbook of Biochemistry for Medical Students**. D. M. Vasudevan, Sreekumari S, Kannan, Vaidyanathan, 6th edition, published by Jaypee Brothers Medical Publishers (P) Ltd,.
2. **Harper's Illustrated Biochemistry.** Robert K. Murray, David A. Bender, Kathleen M. Botham, Peter J. Kennelly, Victor W. Rodwell, P. Anthony Weil..
3. **Lippincott's Illustrated Reviews Biochemistry.** Richard A. Harvey, Richard Harvey Denise Ferrier.
4. **Medical Biochemistry,** N.V. Bhagavan, Academic Pres**.**
5. **Hand book of Nutrition and Food,** Carolyn D. Berdanier, Johanna T. Dwyer, David Heber, by CRC Press
6. **Textbook of Biochemistry with Clinical Correlations.** Ed. Thomas M. Devlin, Wiley-Liss Publishers.
7. **Tietz Textbook of Clinical Chemistry.** Ed. Burtis and Ashwood. W.B. Saunders Company.
8. **Biochemistry**. Ed. Donald Voet and Judith G. Voet. John Wiley & Sons, Inc.
9. **Mark's Basic Biochemistry, A Clinical Approach** Eds. Allisa Peet, Michel Lieberman and Allan D. Marks, Wolters Kluwer Business, Philadelphia.
10. Clinical Biochemistry, Metabolic and Clinical Aspects. William J. Marshall, Marta Lapsley, Andrew P. Day and Ruth M. Ayling. Churchill Livingstone, Elsevier.

5.8. PHYSIOLOGY

[Person in Charge- Head Physiology]

5.8.1. Description

After learning through all the teaching materials and following the teaching activities, students are advised to prepare their own notes which will be personalized and suitable for revising at the time of examination and in future during postgraduate studies. Teaching materials to be used are listed below:

- Detailed objectives for learning Medical Physiology
- Practical Manual
- Lecture notes- power point presentations placed in the Faculty Website
- Standard textbooks of Physiology
- Textbooks of Pathology, Medicine, Surgery, Obstetrics, Gynaecology, Pediatrics and Psychiatry- for quick reference to understand clinical significance

The Standard textbooks are mentioned in reference section of the curriculum book. The students are advised to select one standard book of their preference for personal reading and refer other books and make note of the additional points found in other books. If students find controversies between books, they are advised to discuss with staff to get final ruling.

The teaching learning activities include lecture discussions, practical classes, tutorials and scenario-based discussions (SBD). **Attendance is compulsory in all activities except lecture discussions.**

The departmental staff will conduct lecture discussions. The students are informed of the topics well in time (by this booklet) and are expected to read up based on the objectives. Practical classes will be conducted in the laboratory with the aim of demonstrating important physiological principles and developing basic clinical skills related to Physiology. Tutorials will be in different forms such as free oral question-answer sessions, answer writing sessions, sessions for students to clear their doubts and so on as requested by the students. Scenario based discussions will be conducted by clinicians to illustrate clinical significance of learning physiology and demonstrating the clinical application of Physiology. All these activities will be interactive encouraging student participation and performance instead of simple delivery of information.

Neurophysiology is integrated with neuroanatomy and a common plan is devised to teach as neurology. The staff from the Department of Physiology will teach physiological aspects and staffs from the Department of Anatomy will teach anatomical aspects. This arrangement will reduce repetitions and reduce the student learning time. Also any contradiction or differences of opinion between the two departmental teachings will be ironed out and students will have clear idea on neurology.

Teaching physiology is synchronized with anatomy and biochemistry as far as possible with the idea of facilitating student perception as well as integration of more systems in future.

Further, there will be formative evaluations at the end of each term. The marks of in-course assessments conducted at the end of each term will be notified to students and the answers will be discussed with the students. The same evaluation will also be treated as end of course examination because it will form a portion of the final examination marks.

Aim of the subject

The primary aim of the course is to develop basic knowledge of the functions of the body and its application in management of patients, to develop skills in assessing the functions of systems of the body and to perform basic clinical examination. Through interactive teaching and practical classes, it is also aimed to develop procedural, communication and group skills, promote student centered learning and develop awareness of ethical practices and caring attitude towards other human beings.

Intended Learning Outcomes

- Explain the basic principles of homeostasis, water and electrolyte balance, acid base balance, energy balance and temperature regulation.
- Apply the role of various systems of the body, how they function, the mechanisms that regulate them and the factors that alter their functions.
- Identify how pathological factors interfere with the functions of these systems and how altered functions of these systems cause disease.
- Identify the names of common chemical agents (drugs) that alter the functions of these systems and outline the mechanisms of their actions.
- Elaborate the physiological basis of various tests and investigations used to assess the functions of these systems.
- Demonstrate basic physical examination and use common instruments to make measurements in normal persons- starting from batch mates
- Relate to interpret reports- laboratory reports such as spirogram, ECG and others
- Plan and solve with peers and refer to books/publications to clear doubts or solve problems
- Apply and observe ethical practices when collecting data and working in groups and exhibit caring attitude- respecting their individuality and privacy and maintaining confidentiality
- Develop valid conclusions based on data collected during practical classes
- Adapt the principles and continue study of Physiology

Having attained the knowledge, skills and attitudes mentioned above, the student should view man as a whole person and not a collection of systems.

5.8.2. Intended Learning outcomes of the Physiology Practical

1. Appreciate and acquire skills in handling instruments.
2. Adapt an aptitude for careful observation.
3. Identify and familiarize with nomograms.
4. Apply skill in designing simple experiments.
5. Illustrate simple statistical concepts.
6. Apply skills in recording experiments, tabulating and condensing data.
7. Elucidate valid conclusions from available data.
8. Adapt writing a report
9. Adapt looking up, indexing, and abstracting journals and tracing the literature references on a particular subject.
10. Apply knowledge of concepts of validity, reliability, precision and errors in measurements.
11. Distinguish measurements or perform clinical examination in another human (batch mate) to gain experience before examining patients in Teaching Hospital
12. Apply Physiological learning to health and community problems.

ILOs of Case Based Discussions

Term 1:

The students are expected to benefit from the classes in the following ways:

1. Explain the importance of normal function of body systems for healthy life
2. Explain the physiological basis of signs and symptoms
3. Explain how pathological factors alter functions of body systems
4. Develop interest in clinical application of learning physiology

Term 4:

The students are expected to benefit from the classes in the following ways:

1. Explain the interdependence of all organs for healthy living
2. Explain the physiological basis of symptoms and signs of patients
3. Outline the methods of taking history and examining patients
4. Apply how pathological processes affect functions of the systems
5. Apply the physiological basis of treating/ managing patients
6. Describe the difference in functions of body systems in young and elderly compared to adults

5.8.3. Detailed syllabus

Term 1		
BODY FLUIDS		
Topic	Activity	Duration (Hr)
Introduction to Physiology and Homeostasis	Lecture 1	1
Biological adaptations	Video 1	0.5
Body composition	Lecture 2	1
Measurement of height, weight, body surface area, body fat, waist and hip circuimference.	Practical 1	3x2
Body fluid compartments, definitions of solutions and osmosis	Lecture 3	1
Mechanisms of membrane transport and osmosis	Lecture 4	1
Microcirculation and estimation and Composition of body fluids	Lecture 5	1
Fluid and Electrolyte Balance and their control	Lecture 6	1
Oedema and Dehydration	Lecture 7	1
Structure and functions of cell	Video 2	0.5
Body fluids	Tutorial	2x2
BLOOD		
Topic	Activity	Duration (Hr)
Introduction, General Physical properties - blood and plasma	Lecture 1	1
Osmotic Fragility, ESR and PCV - Demonstration	Practical 1	3x2
Blood	Video 1	0.5
Blood volume and its regulation	Lecture 2	1
RBC count, Hb Measurement and Haematological indices	Practical 2	3x2
Red cell-structure and function, haemopoisis	Lecture 3	1
Fate of red cells and Anaemias	Lecture 4	1
Thrombocytes	Lecture 5	1
Hemostasis, coagulation and anticoagulants	Lecture 6	1
Leucocytes	Lecture 7	1
WBC count (Demonstration), Identification of leucocytes and Differential count	Practical 3	3x2
Immune system, active barriers	Video 2	1
Defense reactions- innate immunity, humeral immunity	Lecture 8	1
Cellular immunity, activation of immune system, hypersensitivity	Lecture 9	1
Blood groups- ABO	Lecture 10	1

Bleeding time, Clotting time, Prothrombin time, aPTT and Fibrinogen time and Blood grouping demonstration	Practical 4	3x2
Rh group, Principles of blood transfusion, tissue transplantation	Lecture 11	1
Blood	Tutorials	3x2
EXCITABLE TISSUE – NERVE & MUSCLE		
Topic	**Activity**	**Duration (Hr)**
Membrane Potential	Lecture 1	1
Action Potential and impulse	Lecture 2	1
Spread of impulse and classification of nerves	Lecture 3	1
Synaptic transmission	Lecture 4	1
Electrical and Mechanical Properties of Skeletal Muscle	Lecture 5	1
Muscle structure, Molecular Basis of contraction	Lecture 6	1
Cardiac and Smooth Muscle	Lecture 7	1
Muscle fatigue and Nerve conduction	Practical 1	3x2
Autonomic nervous system	Video 1	0.5
Autonomic Nervous System	Lecture 8	1
Pharmacology of ANS	Lecture 9,10	2
Excitable tissue	Tutorials	3x2
In course assessment	Exam	2

Term 2		
RESPIRATION		
Topic	**Activity**	**Duration (Hr)**
Design of respiratory system, Upper Respiratory Tract	Lecture 1	1
Mechanics of Breathing, lung volumes and capacities	Lecture 2	2
Respiration	Video 1	0.5
Ventilation, dead space and Ventilation /perfusion ratio	Lecture 3	1
Lung volumes- Spirometry	Practical 1	3x2
Gas exchange in lungs	Lecture 4	1
Oxygen Transport and exchange in tissues	Lecture 5	1
Carbon Dioxide Transport, neural regulation of Respiration	Lecture 6	1
Chemical control of respiration and respiratory acid base balance	Lecture 7	1
Chemical control and Graphic recording of respiration	Practical 2	3x2
Hypoxia, cyanosis	Lecture 8	1
Respiratory Adjustments- exercise	Lecture 9	1
Effect of exercise on ventilation	Practical 2	3x2
Respiratory adjustments- Altitude	Lecture 10	1

Clinical evaluation of Respiratory System and Lung function tests	Practical 3	3x2
Respiratory system	Tutorial	3x2
HEART AND CIRCULATION		
Topic	Activity	Hr
Heart & circulation, Structure and function of heart	Video 1	1
Introduction and Properties of Cardiac Muscle	Lecture 1	1
Electrophysiology of Heart	Lecture 2	1
ECG	Lecture 3	1
Recording ECG	Practical 1	3x3
Cardiac Cycle- mechanical and pressure changes & Heart Sounds	Lecture 4	2
Cardiac Cycle- mechanical and pressure changes & Heart Sounds	Lecture 5	
Cardiac Output, Cardiac Index	Lecture 6	1
Cardiac Work, Metabolism	Lecture 7	1
Blood Vessels, Haemodynamics and Vascular Pulsation	Lecture 8	1
Arteries- Myocardial infarction, Vein & Vein disorders	Video 2,3	1
Measurement of Blood pressure	Practical 2	3x2
Blood Pressure, Regulation	Lecture 9	1
Efects of change in posture and intra thoracic pressure	Practical 3	3x2
Pulmonary, Splanchnic Circulation	Lecture 10	1
Cerebral, Coronary and Cutaneous Circulation	Lecture 11	1
Ischemic pain	Practical 4	3x2
Plethesmography	Practical 5	3x2
Placental and Fetal Circulation	Lecture 12	1
Cardiovascular Adjustments in Exercise, Haemorrhage, Shock	Lecture 13	1
Effects of exercise of Blood pressure	Practical 6	3x2
Drugs on Cardiovascular System	Lecture 14	1
Clinical evaluation of CVS	Practical 7	3x2
CVS	Tutorial	5x2
In course assessment	Exam	2

Term 3

ENDOCRINOLOGY		
Topic	Activity	Duration (Hr)
General principles of endocrinology	Lecture 1	1
Pancreas- Insulin	Lecture 2	1
Glucagon, Diabetes Mellitus	Lecture 3	1
Thyroid	Lecture 4	1
Hyperthyroidism, Hypothyroidism	Lecture 5	1
Parathyroid and Calcium Homeostasis	Lecture 6	1
Bone, cartilage and Joints	Video 1	0.5
Adrenal Medulla	Lecture 7	1

Adrenal Cortex	Lecture 8	1
Hyper, hypo function of Adrenals	Lecture 9	1
Neurohypophysis	Lecture 10	1
Adenohypophysis	Lecture 11	1
Acromegally and Gigantism	Lecture 12	1
Local Hormones, Pineal gland and Thymus	Lecture 13	1
Growth and abnormalities- Pediatrics	Lecture 14	1
Endocrine Physiology	Tutorial	4x2
Neuro Anatomy and Neurophysiology Detailed syllabus is mentioned under the neurology module which will be done in term 3		

Term 4		
GASTRO INTESTINAL PHYSIOLOGY		
Topic	Activity	Duration
General Organization, Overview of Control Mechanisms of GIT	Lecture 1	1
Mastication, Salivation & Deglutition	Lecture 2	1
Gastric Functions- secretion, movements,	Lecture 3	1
Gastric Functions- emptying, their control and peptic ulcer	Lecture 4	1
Pancreas, Liver and Duodenum	Lecture 5	1
Small intestine - Motility, secretions, absorption and their control	Lecture 6	1
Large Intestinal functions and their control	Lecture 7	1
Defecation – Mechanisms and Disorders	Lecture 8	1
Gastrointestinal physiology	Tutorial	3x2

ENERGY BALANCE & TEMPERATURE REGULATION		
Topic	Activity	Duration
Energy Exchange	Lecture 1	1
Energy intake, expenditure, storage and	Lecture 2	1
Energy Balance, its control, obesity and wasting	Lecture 3	1
Metabolic Rate- BMR and energy Requirements	Lecture 4	1
Heat exchange with environment and body temperature	Lecture 5	1
Regulation of body temperature, Fever	Lecture 6	1
Measurement of metabolic rate and Body temperature	Practical 2	3x2
Energy balance, temp regulation	Tutorial	2x2

RENAL PHYSIOLOGY		
Topic	Activity	Duration
Introduction, Glomerular Function	Lecture 1	1
Tubular Function	Lecture 2	1
Concentration of urine	Lecture 3	1
Kidney and lungs in Acid – Base and electrolyte Balance	Lecture 4	1
Effects of various factors on flow of urine	Practical 1	3x2
Micturition	Lecture 5	1
Hemo Dialysis and Renal Function Test	Lecture 6	1
Renal function	Tutorial	2x2
REPRODUCTIVE PHYSIOLOGY		
Topic	Activity	Duration
General aspects and Puberty	Lecture 1	1
Erection, ejaculation and physiology of sexual intercourse.	Lecture 2	1
Male Gametogenesis, Endocrine functions of testis	Lecture 3	1
Female Gametogenesis, Endocrine functions of Ovary	Lecture 4	1
Menstrual Cycle and its control	Lecture 5	1
Pregnancy, Parturition, Lactation	Lecture 6	1
Fertility, Contraceptives	Lecture 7	1
Reproductive physiology	Tutorial	3x2
In course assessment	Exam	2

Scenario Based Discussions- In collaboration with clinicians

Term-1			
No	Topic	Department	Duration (Hr)
1	Oedema	Surgery	3
2	Dehydration	Paediatrics	3
3	Anaemia	Medicine	3
4	Blood transfusion, Rh incompatibility	Obs & Gyn	3
5	Nerve and muscle disorders	Anaesthesia	3
Term 4			
No	**Topic**	**Department**	**Duration**
1	Head injury and stroke	Surgery and Medicine	3
2	Gastrointestinal disorders	Surgery	3
3	Endocrine disorders	Surgery, Paediatrics & Endocrinology	3
4	Malnutrition- Energy Balance	Paediatrics	3
5	Cardiovascular disorders	Medicine & Anaesthesia	3
6	Respiratory disorders and hypoxia	Medicine & Anaesthesia	3
7	Dengu, body Fluids and Fluid therapy	Paediatrics & Anaesthesia	3
8	Renal disorders and acid base balance	Surgery and Anaesthesia	3
9	Physiology of Pregnancy, physiological basis of family planning, lactation and sexual disorders	Obstretics & Gynaecology	3

5.8.4. Summary of Teaching Hours

Physiology (Total Number of hours)					
Activity	Term 1(11)	Term 2(12)	Term 3(12)	Term 4(11)	Total
Lecture	28	25	34	27	114
Practical	18	33	12	6	69
SBD	15	0	0	27	42
Tutorial	8	8	11	10	37
Video	3	2.5	2	0	7.5
In course Assessments	2	2	2	2	8
Total	74	70.5	61	72	277.5

	Term (Weeks)	Lecture No	Practical No	SBD No	Tutorial No	Video No	In Course
Body fluids	Term 1 (11)	7	1	5	2	2	1
Blood		11	4		3	3	
Excitable Tissue		10	1		3	1	
Respiratory System	Term 2 (12)	11	4		3	1	1
Heart and Circulation		14	7		5	4	
Endocrinology	Term 3 (12)	14	0		4	1	1
Neurology		20	4		7	3	
Gastrointestinal System	Term 4 (11)	8	0	9	3	0	1
Energy Balance &Temperature		6	1		2	0	
Renal Phys		6	1		2	0	
Reproductive Phys		7	0		3	0	
Total		114	23	14	37	15	4

5.8.5. Evaluation of Students

Physiology Evaluation					
Type of Examination		**Distribution of Marks- First examination**	**Distribution of Marks- subsequent examinations**	**Details of evaluation- duration, number of questions. ect.**	**Qualifying pass marks (%)**
1	In course Assessment:	20	-	4 Assessment per course	
2	End of the course	80	100		
2.1	MCQ	30	35	50 single response & 30 multiple response – 3hrs	45 % in Essay & MCQ
2.2	Essay	30	35	10 structured questions-3 hrs	
2.3	Practical	10	10	Assessment of skills- 2 x 30 minutes (Blood work and Human subjects)	
2.4	Viva	10	20	5 min/student/panel-two panels (total of 10 minutes)	

5.8.6. References

*Students are advised to look for the latest edition of the textbooks

1. Ganong'sReview of Medical Physiologyby Kim E. Barret, Susan M. Barman and Scott L. Brooks, 25thedition, McGraw Hill,LANGE 2015.
2. Guyton and Hall Textbook of Medical Physiology. Edited by John E Hall, 13th edition, Philadelphia: Saunders, 2015.
3. Hutchison's Clinical Methods. Edited by: Michael Glynn and William Drake, 23rd edition. Saunders, Elsevier
4. Macleod's Clinical Examination. Edited by: Graham Douglas, Fiona Nicol and Colin Robertson, 13th edition. Churchill Livingstone, Elsevier
5. Medical Physiology by RK Marya. 4th edition: CBS Publishers and Distributers 2016.
6. Essentials of Medical Physiology. K. Sembulingam and PremaSembulingam. New Delhi: Jaypee Brothers.
7. An Introduction to Human Physiology by J.H.Green, latest edition, Oxford: Oxford University Press.
8. Samson Wright's Applied Physiology. Cyril A. Keele, Eric Neil and Norman Joels, latest edition, Oxford: Oxford University Press,.
9. Text book of Physiology. Donald Emslie-Smith, Colin R. Paterson, Thomas Scratcherd, and Nicholas W. Read, latest edition, Edinburgh: Churchill Livingstone.
10. Basic Clinical Physiology by J.H.Green, latest edition, Oxford: Oxford University Press.

Synchronization Table of Main Preclinical Subjects

Introductory period		
Anatomy	**Biochemistry**	**Physiology**
General Anatomy Lectures		
Term 1		
Anatomy	**Biochemistry**	**Physiology**
Gross & Applied Anatomy- Upper limb	Biologically Important Carbohydrates	Body fluids
General development of the foetus	Important Lipids for Medicine	
	Amino acids, peptides and proteins for human system related to health and diseases	
Development of musculoskeletal system	Transport of molecules through cell membranes and clinical importance	Blood
Histology of cell and tissues	Disorders in digestion and absorption of food	Excitable tissue – nerve & muscle
Medical Genetics	Gene expression	
	Immunoglobulins	

Term 2

Anatomy	**Biochemistry**	**Physiology**
Development of body cavities and diaphragm	Vitamins	Respiration
Development of Respiratory system		
Development of CVS	Biochemical basis iron metabolism and diseases	
Gross & applied Anatomy -Thorax		
Histology of Immune System	Haemoglobin	
Histology of Respiratory system		
Histology of Cardiovascular system		Heart and circulation
Gross & applied Anatomy -lower limb [comparative learning with upper limb]	Bioenergetics	
	Minerals	
Medical genetics		

Term 3

Anatomy	Biochemistry	Physiology
Development of pharyngeal pouches, arches and clefts, tongue, thyroid gland and face	Carbohydrate Metabolism and biochemical basis of the related disorders	Endocrinology
Gross & applied Anatomy – Head & Neck	Nucleic acid metabolism	
Histology of Endocrine system		
Neurology - Anatomy	Metabolism Amino acid and biochemical basis of the related disorders	Neurology
	Eicosanoids	

Term 4

Anatomy	Biochemistry	Physiology
Development of Digestive system	Lipid Metabolism and biochemical basis of the related disorders	Gastrointestinal Physiology
Gross &applied anatomy – abdomen		
Histology of GIT & Associated glands		
Medical genetics	Serum enzymes of diagnostic value	Energy balance and temperature regulation
Development of urinary system	Foods of plant and animal origin	Renal Physiology
Gross & applied anatomy – posterior abdominal wall & related structures		
Histology of Urinary system		
Development of genital system	Principles of Nutrition	Reproductive Physiology
Gross & applied Anatomy -Pelvis & perineum	Genes and human diseases	
Histology of reproductive system		

Summary of Hours Needed for Preclinical Course

Subject	**Intro**	**Term 1**	**Term 2**	**Term 3**	**Term 4**	**Total**
Duration- weeks	**4**	**11**	**12**	**12**	**11**	**50**
Introductory	46					46
English	50					50
IT	14	15				29
PPDS	17	25	24	0		66
Community & Family Medicine		0	8			8
EBPRM		7	16	9	5	37
Anatomy	5	96	118.5	129	142.5	491
Biochemistry		36	43	44	48	171
Physiology		74	70.5	61	72	277.5
Total	134	246	264	248.5	246	1144.5
Hours Available	**140**	**385**	**420**	**420**	**385**	**1787**

5.9. Microbiology

[Person in Charge- Head Microbiology]

5.9.1. Description

The course is designed to provide basic knowledge of the scientific basis of Microbiology in relation to pathogenesis, diagnosis, treatment and prevention of infectious diseases and basic practical skills in infection control, collection and transport of specimens for the diagnosis of infections and interpretation of test results. It includes general microbiology, bacteriology, virology, mycology, immunology and clinical microbiology.

The teaching and learning methods include lectures, multidisciplinary seminars, practical classes, problem based learning sessions (PBLs), student centred tutorials including integrated tutorials, small group discussions (SGDs) and video shows. The lectures are interactive with questions asked during the lectures and depending on the student response, topics are given to small groups of students to prepare and deliver a five minute presentation at the next lecture.

Students are evaluated by three different types (SEQ, MCQ, OSPE) of in-course assessments before the end course assessment which is held after completion of nine terms.

5.9.2. Intended Learning Outcomes

General microbiology

- Elaborate the classification of microorganisms of clinical importance and define the terminology commonly used in medical microbiology
- Apply the morphology of bacteria in relation to pathogenesis and diagnosis
- Outline the flow of bacterial genetic information in relation to pathogenesis and development of antibacterial resistance
- Distinguish the micrbiome of the human body in relation to its normal function and its role in endogenous infections and cross infections
- Outline mechanisms of bacterial infections
- Apply infection control practices including standard precautions
- Adapt and perform hand hygiene
- Summerise the use of sterilization, disinfection and antisepsis in clinical practice
- Explian the major groups of antibiotics (mode of action, spectrum of activity and limitations to their use)

Bacteriology

- Distinguish bacteria of medical significance with regard to source, transmission, pathogenicity, clinical manifestations and isolation for diagnostic purposes.
- Apply basic characteristics of bacterial pathogens in relation to diagnosis, pathogenicity and specific prophylaxis.
- Relate bacterial resistance to physical and chemical agents.
- Distinguish susceptibility/resistance to antibiotics
- Apply appropriate diagnostic methods for each (microscopy, culture, antigen/antibody/DNA etc)

Mycology

- Apply the general properties and growth in relation to identification, pathogenicity, and clinical manifestations of medically important fungi
- Outline the drugs used in treatment of fungal infections

Virology

- Explain the epidemiology (including transmission, seasonality [if applicable], typical age group affected), clinical manifestations, and diagnosis (including specimen collection, tests commercially available, and the advantages and disadvantages of those tests) of viral infections

Clinical microbiology

- Summerise microbiological investigations of infective diseases
- Show collection and transport of specimens for the diagnosis of infections
- Interpret the test results (including sensitivity and specificity)
- Explain infections of the central nervous system, respiratory system, gastrointestinal system, cardiovascular system, skin, soft tissue, and muscular skeleton system and genitourinary system, infections in pregnancy, foetus and neonates, common febrile illnesses and emerging infections in relation to epidemiology, pathogenesis, clinical presentation, diagnosis, antibiotic choice if indicated and prevention.
- Explian hospital acquired infections and prevention

5.9.3. Detailed syllabus

Term 5		
General Microbiology		
Topic	**Activity**	**Duration**
Introduction to Microbiology	Lecture	1 hour
Morphology and growth of bacteria	Lecture	1 hour
Bacterial genetics	Lecture	½hour
Classification of bacteria	Lecture	½hour
Microbiome	Lecture	1 hour
Pathogenesis of bacterial infection	Lecture	1 hour
Standard precautions & infection control	Lecture	1 hour
Principles of antimicrobial therapy	Lecture	1 hour
Antimicrobial resistance and antimicrobial stewardship	Lecture	1 hour
Infection control	**Practical**	1x6 hour
Standard precautions	**Practical**	1x6 hour
Introducing microbiology laboratory & microscopic demonstration of Gram stained smears	**Practical**	1x6 hour
General microbiology	**Tutorial**	1x6 hour
Antimicrobial resistance	**Tutorial**	1x6 hour
Term 6		
Bacteriology		
Staphylococci (*S. aureus* & CoNS)	Lecture	1½hours
Streptococcus pyogenes, C, G & Viridans.	Lecture	¾ hour
Streptococcus pneumoniae	Lecture	¾ hour
Enterococci	Lecture	½ hour
Aerobic Gram positive bacilli- (Corynebacteria, Listeria, Bacillus spp.)	Lecture	1 hour
Anaerobic Gram positive bacilli	Lecture	2 hours
Actinomycetes & Nocardia	Lecture	1 hour
Chlamydia & Rickettsia	Lecture	1 hour
Spirochaetes- (Treponemes, Leptospira & Borrelia)	Lecture	2 hour
Mycoplasma & Ureaplasma	Lecture	1 hour
Mycobacteria (introduction and non tuberculous mycobacteria)	Lecture	1 hour
Bacteriology	**Tutorial**	1x6 hour
Gram negative cocci (Neisseria & Moraxella)	Lecture	1½ hours
Haemophilus, Legionella, Bordetella & Brucella	Lecture	1½ hours
Curved Gram negative bacilli- (Vibrio, Helicobacter, Campylobacter)	Lecture	1½ hours

Term 7		
Bacteriology		
Enterobacteriaceae- (*E.coli*, *Klebsiella*, *Salmonella* spp, & *Shigella*)	Lecture	2 hours
Other Gram negative bacilli (*Pseudomonas*, *Acinetobacter* & *Burkholderia*	Lecture	1 hour
Bacteriology	**Tutorial**	1x6 hour
Mycology		
Introduction to mycology- (general properties of fungi, medical importance and investigations)	Lecture	1 hour
Superficial mycoses & subcutaneous mycoses	Lecture	1 hour
Candida infections	Lecture	1 hour
Systemic mycoses and opportunistic infections	Lecture	2 hours
Antifungal agents	Lecture	1 hour
Demonstration of specimen collection & transport for fungal identification	**Practical**	1x6 hour
Mycology	**Tutorial**	1x6 hour
Virology		
Introduction and general properties of viruses	Lecture	1 hour
Viral diagnosis	Lecture	1 hour
Picornaviruses	Lecture	1 hour
Rabies	Lecture	2 hours
Virological diagnosis including collection and transport of specimens	**Practical**	1x6 hour
Clinical microbiology		
UTIs/ prostatitis / epididymitis / orchitis	**MDS**	1 hour
Collection and transport of specimens	Lecture	1 hour
Demonstration –urine collection, transport and storage for culture	**Practical**	1x6 hour
CNS infections	Lecture	1 hour
Meningitis	**MDS**	1 hour
Demonstration of lumbar puncture, collection of CSF, storage and transport	**Practical**	1x6 hour
Identification of pathogens in the microbiology laboratory – Day1, Day2, Day3	**Practical**	1x6 hour
Clinical microbiology	**Tutorial**	1x6 hour
Term 8		

Virology		
Mumps, measles & rubella viruses	Lecture	1 hour
Arboviruses (Dengue, JE, Chikungunya)	Lecture	1 hour
Pox, Parvo, Papilloma, Polyoma and Adeno, viruses	Lecture	1½ hours
Herpesviruses (HSV, VZV, CMV, EBV, HHV)	Lecture	2½ hours
VZV	**Tutorial**	1x6 hour
Mumps, measles & rubella	**Tutorial**	1x6 hour
Respiratory Viruses	Lecture	1 hour
Clinical microbiology		
Respiratory infections (common cold syndrome, otitis media & sinusitis, epiglottitis, pharyngitis, croup, acute bronchitis, influenza)	Lecture	2 hours
Influenza	**MDS**	1 hour
Pneumonia & lung abscess	**MDS**	1 hour
Demonstration - collection of nasal swab, throat swab, sputum specimen & nasopharyngeal swab for culture, transport and storage	**Practical**	1x6 hour
Tuberculosis	**MDS**	1 hour
Tuberculosis diagnosis	**Practical**	1x6 hour
Leprosy	Lecture	1 hour
Infections in pregnancy, foetus & neonates	**MDS**	1 hour
STDs & reproductive tract infections	Lecture	1 hour
Dengue	**MDS**	1 hour
Typhus	**MDS**	1 hour
Rheumatic fever	**MDS**	1 hour
Infective endocarditis	**PBL**	2x6 hour
Sepsis	**MDS**	1 hour
Demonstration collection of blood for culture, storage and transport	**Practical**	1x6 hour
Clinical microbiology	**Tutorial**	1x6 hour
Term 9		
Virology & clinical microbiology		
Viruses causing gastroenteritis	Lecture	1 hour
Hepatitis viruses	Lecture	1 hour
Hepatitis	**MDS**	1 hour
HIV	**MDS**	1 hour
Oncogenic viruses and prions	Lecture	1 hour
Abdominal infections	Lecture	1 hour
Gastrointestinal infections	Lecture	2 hours
Enteric fever	**MDS**	1 hour

Skin, wound and soft tissue infections	**MDS**	2 hours
Interpretation of microbiology reports & ABST	**Practical**	1x6 hour
Diarrhoeal Illnesses	**IT**	1x6 hour
Clinical Microbiology	**Tutorial**	1x6 hour
Virology	**Tutorial**	1x6 hour
Infections in compromised host	Lecture	1 hour
Zoonotic diseases	Lecture	1 hour
Emerging infections	Lecture	1 hour
Hospital Acquired Infections	Lecture	2 hours
Antimicrobial use in clinical practice	Lecture	3 hours
Clinical Microbiology	**Tutorial**	1x6 hour

(MDS - Multidisciplinary seminar, IT - Integrated tutorial, PBL – Problem based learning)

5.9.4. Summary of student contact hours

	Term 5	**Term 6**	**Term 7**	**Term 8**	**Term 9**	**Total**
Lecture	8	17	16	11	14	**66**
MDS	-	-	2	8	5	**15**
Tutorial	2	1	3	3	3	**12**
PBL	-	-	-	2	-	**02**
IT	-	-	-	-	1	**01**
Practical	3	-	5	3	1	**12**
Total	**13**	**18**	**26**	**27**	**24**	**108**

5.9.5. Evaluation

Type of Examination	Distribution of Marks- First examination	Distribution of Marks - Subsequent examinations	Details of evaluation – No. of hrs, No. of question etc.	Qualifying pass marks (%)
In course Assessment:	20		3 assessments- SEQ (1 Q from Immunology Module), MCQ and OSPE	
End of the course	80	100		
MCQ	35	40	30 questions-1 ½ hours	45 in theory
Essay	35	40	4 questions - 2hours	
OSPE	10	20	½ hour	

5.9.6. References

National guidelines

1. Guidelines on Management of Dengue Fever & Dengue Haemorrhagic Fever in Adults. (http://www.epid.gov.lk/web/images/pdf/Publication/guidelines_for_the_management_of_df_and_dhf_in_adults.pdf)
2. Revised protocol for Anti Rabies Post Exposure Therapy 16.08.2019. (https://drive.google.com/file/d/11cp9F94ALmt1DtD-8PdrnghZRxm_iZH3/view)
3. Immunization Handbook, National Expanded Programme on Immunization, Sri Lanka. (http://www.epid.gov.lk/web/images/pdf/Publication/Immunization_Guide_2012.pdf)

Textbooks

1. Medical Microbiology. Greenwood, D. Slack, R.C.B. and Peutherer, J.F. 18th edition, Edinburgh: Churchill, Livingstone, 2012.
2. Review of Medical Microbiology and Immunology. Levinson, W and Jewetz, E., 15th edition, New York: The Mcgraw-hill companies inc., 2018.
3. Medical Microbiology. Mims, Goering, V.R., Dockrell, H.M., Zuckerman, M., Roitt, I. M, and Chiodini, P.L., 5th edition, Edinburgh: Elsevier, 2013.
4. Notes on Medical Bacteriology. Sleigh, D.J. and Timbury, M.C, 5th edition, New York: Churchill Livingstone, 1998.

Reference Books

1. Principles and Practice of Infectious Diseases Vol 1&2. Mandell, G.L., Bennett, J.E., Dolin, R, and Blaser, M.J, 9th edition ,Philadelphia :Churchill Livingstone, 2019.
2. Medical Microbiology. Murray, P.R., Rosenthal, K.S. and Pfaller, M.A, 8th edition, Philadelphia: Elsevier, 2016.
3. Roitt's Essential Immunology. Delves, P.J., Martin, S. J., Burton, D.R. and Roitt, I.M. 13th edition, Massachusetts : Blackwells, 2017.
4. Cellular and Molecular Immunology. Abbas, A.K., Lichtman, A.H. and Shiv Pillai, 9th edition, Philadelphia: Elsevier, 2018.

5.9.7. Immunology Module

[Person in Charge - Head/Department of Microbiology]

5.9.6.1. Description

The Curriculum in Immunology lists the essential knowledge and skills required by the medical students. It represents the topics and themes considered essential. The learning outcomes enumerated in this document is achieved in different years of the course depending on the expectation at that level. A single session could focus on one objective or cover multiple objectives. It is expected that the competencies achieved through the module will enable the basic doctor to understand the application of immunological principles in the diagnosis and prevention of infectious diseases, management of hypersensitivity, autoimmune diseases and immunodeficiency and in immune therapy in the hospital and community setting.

Aim of the module is to provide medical undergraduates the appropriate knowledge and skills in immunology that would enable them to function as a basic doctor when attending to patients with related disorders.

5.9.6.2. Intended Learning Outcomes

- Explain the structure and function of the normal immune response.
- Elucidate in detail the components and effector functions of the innate immune response and adaptive immune response.
- Apply the immunological principles in the diagnosis and prevention of infectious diseases.
- Explain the clinical manifestations, pathogenesis, diagnosis and principles of management of hypersensitivity, autoimmune disorders and immunodeficiency.
- Apply immunological principles to the prevention and management of complications of blood transfusions and organ transplantation.
- Distinguish the use of immune modulators currently available in clinical practice.
- Outline recent developments in immunology as applicable to clinical medicine (immune therapy).

Some basic immunology topics in relation to blood grouping, immunoglobulins and autoimmunity are taught and assessed separately by individual departments in phase 1**.**

The teaching learning activities of phase II will commence at term 5 with basic immunology and term 7 onwards on applied immunology

5.9.6.3. Detailed syllabus

Term 5			
Basic Immunology (by Department of Microbiology)			
hrs	**Mode**	**Topic**	
½	Lecture	Overview of the immune response	
1½	Lecture	Innate immune response	
1	Lecture	Antigen, antigen presentation and acquired Immune response	
1	Lecture	Cells and tissues/organs of the immune system and their organization	
1	Lecture	Cell mediated immune response	
1	Lecture	Humoral immune response	
1	Lecture	Immune response to infection	
Applied Immunology			
hrs	**Mode**	**Topic**	**Departments responsible**
1	Lecture	Immunological methods in diagnosis	Microbiology
1	Lecture	Active and passive immunization	Microbiology
2	**SGD**	Immunization	Micro/Paed/DCFM
1	Lecture	Hypersensitivity	Pathology
1	Lecture	Allergy and anaphylaxis	Paed/Medicine
1	Lecture	Autoimmune diseases	Pathology
1	Lecture	Immune deficiency disorders	Path
1	Lecture	Hypersensitivity, autoimmunity and immune deficiency in relation to infections	Microbiology
1	Lecture	Tissue transplantation	Path/surgery
2	Lecture	Immune-modulators	Clinical Pharmacology
1x6	**Tutorial**	Basic and applied immunology	Microbiology
1x6	**Tutorial**	Disorders of immunity and immune response	Pathology

5.9.6.4. Summary of student contact hours

Mode	**hrs**
Lecture	16
Tutorial	02
SGD	02
Total	**20**

5.9.6.5. Assessments

There will be no separate examination initially and the assessment of this module will be by a continuous assessment (in course assessment)under Microbiology.

5.9.6.6. References

1. Roitt's Essential Immunology. Delves, P.J., Martin, S. J., Burton, D.R. and Roitt, I.M. 13th edition, Massachusetts : Blackwells, 2017.
2. Cellular and Molecular Immunology. Abbas, A.K., Lichtman, A.H. and Shiv Pillai, 9th edition, Philadelphia: Elsevier, 2018.

5.10. Parasitology

[Person in Charge- Head, Department of Parasitology]

5.10.1. Description

The aim of the course is to develop basic knowledge and skill to identify the parasites, diagnose the diseases caused by them, manage the patients, prevent and control parasitic diseases.

5.10.2. Intended Learning Outcomes

- Define the classification of parasites
- Explain the geographical distribution, life cycle, morphology at different stages, sources of infection and mode of transmission of each parasite with a view of prevention and control of parasitic diseases.
- Identify the parasites at different stages of life cycle, their vectors and hosts by macroscopic or microscopic examination as appropriate.
- List the organs or the systems affected by the parasites and describe the pathogenesis, signs and symptoms
- Explain the sample collection methods, transport and laboratory diagnosis of parasitic diseases.
- Examine stool for intestinal parasites and blood smear staining for malaria and filarial parasites.
- Outline treatment of parasitic illnesses and management of patients.
- Elucidate the prevention and control of each parasitic illness
- Define and elaborate the parasitic zoonotic diseases
- Identify the medically important snakes and the basis of management of snake bite.
- Motivate to use the knowledge and skills obtained in the subject to understand the problems and management of their patients during clinical clerkships at the Teaching Hospital.

The teaching / learning methods include lectures, practical classes and tutorials. Students are encouraged to actively participate in the activities. Power point presentations are given to students as learning materials.

Students are evaluated by three in course assessments and end of course assessments. Formative evaluations will be conducted frequently and the answers will be discussed with the students.

5.10.2. Detailed Syllabus

Term 6		
1	Lecture	Introduction to Parasitology
3	Lectures	Malaria
3	Lectures	Leishmaniasis
2	Lectures	Toxoplasmosis
2	Lectures	Trichomoniasis
4	Lectures	Amoebiasis, Giardiasis, Balantidiasis and Cryptosporidiasis
3 x 1	Demonstration	Malaria
3 x 1	Demonstration	Leishmaniasis
3 x 1	Demonstration	Intestinal protozoan parasites
2 x 1	Tutorials	Malaria
2 x 1	Tutorials	Leishmaniasis
3 x 1	Tutorials	Toxoplasmosis and Trichomoniasis
4 x 1	Tutorials	Diarrhoea causing protozoans
Term 7		
1	Lecture	Introduction to Helminthology
1	Lecture	Ascariasis
1	Lecture	Hookworm disease
1	Lecture	Strongyloidiasis
1	Lecture	Enterobiasis
1	Lecture	Trichuriasis and Trichinellosis
2	Lecture	CLM and VLM
2	Lectures	Lymphatic filariasis
1	Lectures	Dirofilariasis
4 x 1	Demonstration	Ascariasis, Trichuriasis, Hookworm disease, Enterobiasis, Trichinellosis and Filariasis
2 x 1	Tutorials	Soil Transmitted Helminths
2 x 1	Tutorials	Other Helminths
3 x 1	Tutorials	Lymphatic filariasis
Term 8		
2	Lectures	Cestode
1	Lectures	Larval Cestode
1	Lectures	Schistosomiasis
1	Lecture	Introduction to Medically important ectoparasites
2	Lectures	Mosquitoes and Mosquito control
1	Lectures	flies
2	Lectures	Scabies other medically important mites
1	Lecture	Ticks, bugs and fleas
3 x 1	Demonstration	Cestode, Larval Cestodes and Schistosomiasis

3 x 1	Demonstration	Mosquitoes and flies
3 x 1	Demonstration	Mites, ticks, bug and fleas
2 x 1	Tutorials	Ectoparasites
Term 9		
2	Lectures	Identification of medically important Snakes
2	Lectures	First aid, management and prevention of snake bite
1	Lectures	Parasitic zoonosis
3 x 1	Demonstration	Snakes
3 x 1	Tutorials	Snakes and snake bite management
6 x 1	Practical	Stool Examination

5.10.3.Summary

	Term 6	Term 7	Term8	Term 9	Total
Lecture	**15**	**11**	**11**	**05**	**42**
Demonstration / Practical	**03**	**01**	**03**	**02**	**09**
Tutorial	**04**	**03**	**01**	**01**	**09**
Total	**22**	**15**	**15**	**08**	**60**

5.10.4. Evaluation of Parasitology

Type of Examination	Distribution of Marks- First examination	Distribution of Marks- subsequent examinations	Details of evaluation-No. of hrs No. of question etc.	Qualifying pass marks (%)
In course Assessment:	15		2 SEQ + 1 Practical Examination	
End of the course	85	100		
MCQ	20	20	20 MCQs- 1hr	45%
Essay	40	45	4 Essay Questions-2hr	
Spots	15	20	20 min/group	
Viva	10	15	10 min/ student	

5.10.5. References:

Textbooks

1) Medical parasitology. D.R Arora and Brij Bala Arora. 5th Edition, New Delhi: CBS Publishers & Distributors, 2018
2) Paniker's textbook of medical parasitology. C K Jayaram Paniker, 8th edition, New Delhi: Jaypee Brothers, 2017.
3) Parasitology: Protozoology and helminthology in relation to clinical medicine. Chatterjee, K.D, 13th edition, New Delhi: CBS publishers, 2009.
4) Basic Clinical Parasitology. Franklin A Neva, 6th edition, East Norwalk: Prentice Hall International Inc, 1996.
5) Medical entomology for students. Mike Service, 5th edition, Cambridge university press, 2012.

5.11. Forensic Medicine

[Person in Charge- Head Forensic Medicine]

5.11.1. Description

The objective of the course in forensic medicine is to develop adequate knowledge, skills and attitudes to enable the students to fulfil the medico-legal obligations.

5.11.2. Intended Learning Objectives

- Explain the basic forensic procedures, supervise them and interpret the result.
- Apply the ethical issues in medical practice and the bodies that govern the adherence to the ethical practices.
- Distinguish post-mortem, describe, identify and report ante mortem and post mortem injuries
- Explain diagnose and report the causes of death.
- Examine, Identify, diagnose and report victims of sexual offences/child abuse and all kinds of abuses.
- Choose appropriate evidence in a court of law

The teaching / learning methods include lectures, tutorials, museum demonstrations and clinical attachment. Evaluation is conducted at the end of the course.

The course contributes to outcome numbers 1and 7.

5.11.2. Detailed Syllabus

Introduction		
1	Lecture	Introduction to Forensic Medicine branches, scope and the need
1	Lecture	Legal system of Sri Lanka with special reference to practice of medicine
1	Lecture	Medico-legal services in Sri Lanka
1	Lecture	Medico legal Duties of different category of medical professionals.
Clinical forensic medicine		
5	Lecture	mechanisms of causation of injuries in the living (surface and internal injuries), documentation of injuries, medico-legal classification of injuries, immediate and remote complications of injuries, mechanisms and identification of injuries caused by blunt weapons, sharp weapons, firearms, burns/fires, acids/alkali, lightning, electricity and explosives,

		regional injuries, road traffic trauma, other transportation injuries, injuries due to falls and mob violence, barotrauma, , child abuse and its various forms, domestic violence, elder abuse, examination and documentation of sexual assault, examination for virginity, recent and remote delivery, , certification for mental illness, forensic DNA profiling, documentation of medico-legal reports.
1	Lecture	ageing of injuries and scars,
1	Lecture	basic concepts of compensation
1	Lecture	clinical examination for drunkenness
1	Lecture	MLEF and MLR
2x3	Tutorial	
Medical Ethics		
1	Lecture	International code of medical ethics
2	Lecture	Medical confidentiality, testamentary capacity, fitness to plead, dying deposition and dying declaration
1	Lecture	Consent to medical treatment
1	Lecture	Roles and responsibilities of a doctor in maintaining relationships
2		Medical aspects of mental diseases.
1	Lecture	Medical negligence
1	Lecture	SLMC
1	Lecture	Health care rights
1	Lecture	Research Ethics
2	Lecture	Controversial Issues: euthanasia, death penalty, cloning, HIV/AIDS, Organ transplantation
2x3	Tutorial	
Forensic Pathology		
1		Investigation of death
1	Lecture	Introduction to routine Autopsy and techniques
1		Medico legal autopsy and pathological autopsy
1		High risk autopsies
1	Lecture	COD, mode of death and circumstances of Death
2	Lecture	Sudden deaths/Natural deaths
1	Lecture	Reports – PM report and Medical certificates
2	Lecture	Changes after death and Estimation of Time since death
1	Lecture	Postmortem artifacts
1	Lecture	Investigation of a crime and Doctor at scene of crime

1	Lecture	Trace evidence and transportation to lab
1	Lecture	Starvation and neglect.
2	Lecture	Exhumation and excavation
1	Lecture	Mass disaster
1	Lecture	SIDS and Negative Autopsy
1	Lecture	Forensic aspects of blood
1	Lecture	Identification
1	Lecture	Forensic anthropology
2	Lecture	Forensic Radiology, Odentology, Photography and Serology
1	Lecture	Court procedure & Expert Testimony in Courts
3x3	Tutorial	
2x3	Museum	
Forensic Aspects of injuries		
1	Lecture	Pathology and Pathophysiology of trauma
3	Lecture	Introduction to injuries
1	Lecture	Hurt and Grievous hurt
5	Lecture	Regional injuries (head, face, neck, chest, abdomen, injuries to spinal cord and musculoskeletal injuries.)
2	Lecture	Firearm injuries
1	Lecture	Explosive injuries
3	Lecture	Transportation injuries
2	Lecture	Thermal injuries
1	Lecture	Electrical injuries
2	Lecture	Death in custody, torture and human right violation.
1	Lecture	Injury pattern in falls.
1	Lecture	Sequalae and complications of injuries
1	Lecture	Hyper and hypothermia
3	Lecture	Sexual offences
3	Lecture	Child abuse
1	Lecture	Abortion
1	Lecture	Maternal deaths
1	Lecture	Infanticide
8	Lecture	Asphyxia (Introduction, drowning, strangulation, hanging, throttling, smothering, chocking, traumatic asphyxia and auto erotic asphyxia)
6x3	Tutorial	
3x3	Museum	

Forensic Toxicology		
8	Lecture	Introduction, Plant poison, pesticides, methyl and ethyl alcohol, narcotic poisons, Cyanide, Corrosive, kerosene oil, food poisoning, metallic poisons, therapeutic drugs and animal poisons.
3x3	Tutorial	
2x3	Museum	

LEARNING EXPERIENCE:

LECTURES:

Attendance is not compulsory. Punctuality is essential. General Explanations and concepts will be introduced. Factual details will not necessarily be discussed. These will be used only as a guide in the process of self-learning by the student.

TUTORIALS:

Two types of tutorials will be conducted; (i) traditional tutorials classes where students are expected to come to the class with a written answer to a given question, (ii) small group discussion (SGD) classes where a broader topic will be discussed with the participation of all the students in the group. In both tutorial types students are expected to play the dominant role. Teacher will initiate and facilitate the learning experience. Through these activities students will learn to participate in group work and answer essay type questions.

SHORT APPOINTMENT/PRACTICALS:

ALL medical students will follow a Short Appointment in Forensic Medicine during their fourth year of studies. The Short Appointment in Forensic Medicine is the main opportunity for all medical students to expose themselves to practical aspects of clinical forensic medicine and forensic pathology. It is also the best platform to discuss the relevant principles and practices of forensic science, forensic toxicology, medical law and ethics at length.
Therefore the Dept. of Forensic Medicine expects that all students would take the maximum benefit out of this appointment.
This program will continue for one month from Monday to Saturday inclusive of public holidays. The students will be learning in the Dept. of Forensic Medicine premises during the first two weeks and will be moving to Office of the JMO, Teaching Hospital, Jaffna for the next two weeks.
The academic staff of the Dept. of Forensic Medicine, Registrars/Senior Registrars in Forensic Medicine and Consultant JMOs & Consultant Forensic Psychiatrists

of Teaching Hospital Jaffna will undertake teaching-learning sessions regularly, based on their availability.

The learning programme of short appointment is mainly centered on group learning of certain skills and obtaining first-hand experience of completing medico-legal with traumatic or pathological lesions.

ALL students will be assessed at the end of short appointment via a Clinical Forensic Medicine long case conducted at the Teaching Hospital Jaffna. It will carry 5% of marks to the final assessment.

For Tutorials and the Short Appointment (practical classes) the attendance is compulsory. If the attendance is below 80% the student will not be allowed to sit for the second examination for medical degrees Part I Examination in Forensic Medicine. Therefore, they will be debarred from sitting the whole examination. If a student falls ill during term time, he/she should submit a valid medical certificate to the assistant registrar within seven days of falling ill. (an attendance of 80% is required with medical certificates).

5.11.3. Summary:

	Term 5	Term 6	Term 7	Term8	Term 9	Total
Lectures		30	25	20	24	99
Tutorials		6	9	18	9	42
Clinical						96
Museum		6		9	6	21
Total		42	34	47	39	258

5.11.4.Evaluation

Type of Examination		Distribution of Marks- First examination	Distribution of Marks- subsequent examinations	Details of evaluation –No. of hrs No. of question etc.	Qualifying pass marks (%)
1	Continuous assessment	20		20 MCQ – (10) 10 Station OSCE (05) Long case (05)	
2	End of the course	80			
	Essay	40	40	5 questions-3hr	45%
	MCQ	20	20	40 questions	
	OSPE	10	20	10 stations	
	Viva	10	20	10 min/ student	

Continuous assessments:

Conducted at the beginning of 9th terms. At the beginning of the 9th term ALL students will be given 20 MCQs to assess mostly the knowledge on clinical forensic medicine and forensic pathology components. It should be answered within 60 minutes. It will carry 10% of marks to the final assessment.

At the beginning of the 8th term ALL students will do the OSPE on clinical forensic medicine, forensic pathology, forensic science and forensic toxicology at the Dept. of Forensic Medicine premises. There will be 10 stations and 6 minutes allocated for each station. It will carry 5% of marks to the final assessment.

The evaluations of the in-course assessments will be done by the departmental academic staff.

5.11.5. References

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5.12. Community and Family Medicine

[Person in Charge- Head Community and Family Medicine]

5.12.1. Description

The objective of the course is to develop knowledge, skills and attitudes of the students to be able to improve individual, family and community health and disease prevention.

5.12.2. Overall objectives

- Describe the health information systems.
- Obtain and interpret the health statistics and demographic data with emphasis on trends.
- Assess evidence with respect to validity and reliability and arrive at conclusions by way of logical deductions.
- Describe the epidemiology, prevention and control of the communicable and non-communicable diseases.
- Identify illnesses that are prevalent in the community and health issues of the community and institute appropriate remedial and control measures.
- Identify social factors in the society that affect health and implement preventive, curative and rehabilitative measures at community and social level.
- Describe the interaction between people and the environment in relation to health and diseases and improve the interaction in a way to improve the health of the people while preserving the nature.
- Describe the factors that contribute to reproductive health and implement measures to improve it through sex education, family planning and maternity and child health.
- Exhibit leadership skills and work as a leader or a member of a team depending on the situation.
- Describe local and international health care strategies and systems.
- Describe health promotion methods available for individuals, families and community, implement them and evaluate the activities.
- Describe the appropriate food and nutrition for all stages of life and disease conditions and the importance of balance diet to maintain good health.
- Develop food habits that promote the quality of life and health out of locally available and affordable food.
- Describe and practice ethical and legal issues relating to doctor-patient relationship, interactions with other health professionals and with the society.
- Develop, maintain and promote Personal characteristics and attitudes for a career as a health professional.

Teaching Learning

The teaching / learning activities include lecture-discussions, tutorials, field health program and visits to community health institutions and attachment to primary health care institutions and administrative offices.
The lecture-discussions vary from traditional lecture to working out solutions to statistical and community problems. Tutorials are mainly designed as case based learning.

Institutional visits are study tours organized by the department as part of clinical clerkship to big institutions of health concerns like factories for occupational health demonstrations, orphanages and institutions for differently abled children or persons. Students are given detailed objectives for the visit of each institution.

Clinical attachments include attachment to primary care institutions including Family Health Center at Divisional Hospital Kondavil. Students will follow the preventive and maternal and child health activities in University Project area (Nallur MOH) and learn the health administration by posting to RDHS office, Director's office, Teaching Hospital Jaffna and a Divisional Hospital.

Field health program is designed to do field related health activities in Nallur MOH area. A specific field area with 5-6 households will be allocated for a student. Students have to work individually as well as group to improve the health status of the family as well the community. Students will be guided by academics of the department during the field health program. Assessment of this program includes field evaluation and portfolio submission.

Continuous in course assessments are conducted during the course. Assessment of clinical attachment includes log book, portfolio and health education.

5.12.2. Intended learning Objectives

Principles of Community Medicine

- Explain the concepts of disease and determinants and prevention
- List the available healthcare delivery systems in Sri Lanka

Statistics

- Select a data set and able to summarize data
- Apply basic inferential statistical methods and draw conclusions from such analysis
- Summarise the data in a scientific manner
- Interpret the statistical findings which appear in the papers published in medical journals
- Find inferences from available information to practice evidence-based medicine

Demography

- Explain the demographic behavior in social, economic and policy contexts

Basic epidemiology

- Explain the concepts and scope of epidemiology
- Analyze community health data
- Compile measures of disease frequency
- Apply the principles underlying the application of different study designs
- Analyse and calculate measures of risk of exposure
- Apply the concepts of measurement of test performance of screening tests
- Explain the basic epidemiological concepts in establishing causation

Maternal and child health

- Distinguish the knowledge related to Maternal, Newborn and Child Health, Reproductive Health and Family Planning (FP)
- Apply the principles and evidence-based interventions in MCH

Community nutrition

- Explain the nutritional situation and ongoing interventions of the country
- Apply the assessment of nutritional status at individual and population levels
- Distinguish the role of nutrition in communicable diseases and non-communicable diseases
-

Environmental and occupational health

- Define concept of "Environmental health" & describe environmental health problems common to Sri Lanka

Health promotion

- Define health, health promotion, health education, primary health care and public health
- Illustrate the organization of health promotion services in Sri Lanka

Family medicine

- Explain the concepts applied for controlling NCDs and communicable diseases in family medicine practices
- Apply the of principles and practice of ethics and professionalism
- Explain the management practices of a basic primary care organization
- Relate the opportunistic health promotion

Health information system

- Illustrate the health information system and its usefulness

Health economics

- Apply the principles of Health Economics

Applied epidemiology and communicable disease

- Apply the principles of epidemiology for effective control/prevention of communicable diseases

Non communicable disease epidemiology

- Explain global and local epidemiology of NCDs
- Illustrate the national NCD policies and its implementation
- Apply surveillance systems available for NCDs

Health planning and management

- Apply the principles of human resource management
- Explain office management practices
- Apply basic principles of management

5.12.3. Detailed curriculum

Phase1		
Term 2- Principles of Community Medicine		
Health care services		
2	Lecture	Definition of health; concepts of disease; determinants of disease; disease
2	Lecture	Prevention at different levels; definition and components of Primary Health Care
2	Lecture	Organizational structure of health delivery systems and health manpower in Sri Lanka (Introduction to health system)
		Statistics
2	Lecture	Appropriate summary statistics and graphical methods for describing a data set

5.12.4. Summary of Phase I

Activity	Term 1	Term 2	Term 3	Term 4	**Total**
Lecture		08			**08**
Total		**08**			**08**

Phase II		
Term 5		
Demography		
1	Lecture	Definitions in Demography
2	Lecture	Factors affecting Size & Composition of the population and its effect on health of the people and health system in Sri Lanka and world
1	Lecture	Sources and collection of vital statistics
Basic epidemiology 1		
1	Lecture	Concepts of epidemiology
2	Lecture	Measures of morbidity and mortality
4	Lecture	Epidemiological study designs (descriptive, analytical, trials, and experiments, systematic reviews and meta-analysis, Qualitative studies)
1	Lecture	Certification of death and its importance
2	Lecture	Surveillance
Statistics 1		
1	Lecture	Appropriate summary statistics and graphical methods for describing a data set
2	Lecture	Describing data
Tutorial 1		
3	CBL	Demography, basic epidemiology and descriptive statistics

Term 6		
Maternal and Child Health (MCH) 1		
2	Lecture	Introduction to child care & EPI programme
2	Lecture	Growth Monitoring
2	Lecture	Definition & concepts of reproductive health, Safe motherhood
2	Lecture	Family health Programme in Sri Lanka
Community Nutrition		
1	Lecture	Understanding the causes of malnutrition
2	Lecture	Handling Common nutrition problems in the population
2	Lecture	Handling Common nutrition problems in an individual person

1	Lecture	Importance of nutrition in the origin of communicable diseases and NCD
Environmental & Occupational Health 1		
1	Lecture	Sources and effects of environmental pollution & , prevention
1	Lecture	Food safety and sanitation
1	Lecture	Housing, water supply
Tutorial 2		
3	CBL	**MCH 1, Community nutrition & E & OH 1**
Field Health Component		
10	Field Visit	

Term 7		
Health Promotion		
1	Lecture	Introduction to the basic concepts of health promotion
2	Lecture	Organization of Health Promotion Services in Sri Lanka
1	Lecture	Different models of health promotion
Family Medicine		
2	Lecture	The principals of Family practice
2	Lecture	Specific health problems related to stages in the individual family life cycle
2	Lecture	Concept of the doctor – patient relationship in family practice & process of consultation in primary medical care
2	Lecture	Principles of patient management & prescribing and Patient compliance & factors that influence It
2	Lecture	Medical records in family practice
2	Lecture	Caring for an ill person in the home
2	Lecture	Management of terminally ill patient, death and bereavement by the family physician
2	Lecture	Organization of a family practice
Field Health Component		
10	Field Visit	

Term 8		
Health Information System		
1	Lecture	Health Indicators
1	Lecture	National Health Information System
Health Economics		
1	Lecture	Introduction to Health Economics
1	Lecture	Different models of Health Economics
2	Lecture	Current health Expenditure Pattern & Future challenges in Health financing
Basic Epidemiology 2		
2	Lecture	Determining factors in causation of disease
2	Lecture	Quality of data
2	Lecture	Concept of screening
Statistics 2		
2	Lecture	Standard error, confidence interval, pvalue, hypothesis, type I and Type II errors
2	Lecture	Test of significants: applications - quantitative data
2	Lecture	Test of significants: application- qualitative data
Tutorial 3		
4	CBL	Health promotion, Family Medicine, HIS, Health economics, Basic epidemiology & Statistics
In-course Assessment		
2	Written Exam	The subjects covered in Term5-8
Field Health Component		
10	Field Visit	

Term 9		
Applied Epidemiology and Communicable Diseases		
2	Lecture/Presentation	Principals of communicable disease prevention
2	Lecture/Presentation	Outbreak investigation
2	Lecture/Presentation	Epidemiology, control and prevention of common communicable diseases

Non Communicable Disease Epidemiology		
2	Lecture/Presentation	Epidemiological transition, Nutritional transition, Dual burden of diseases
2	Lecture/Presentation	Global regional and local epidemiology of common NCDs
2	Lecture/Presentation	National policies and strategies on NCD prevention & surveillance
Statistics 3		
2	Lecture/Presentation	Using SPSS and analyze the data
2	Lecture/Presentation	Interpreting and applying statistical knowledge in normal clinical practices
Tutorial 4		
4	CBL	Communicable disease, NCDs and statistics
Field Health Component		
10	Field Visit	

Term 10		
MCH 2		
2	Lecture/Presentation	Adolescent Health & School Health Services
2	Lecture/Presentation	Gender issues & Women health
E &OH 2		
2	Lecture/Presentation	Urbanization and industrialization, Disposal of refuse & excreta
2	Lecture/Presentation	Occupational health
2	Lecture/Presentation	Disaster Management
Health planning & Management		
2	Lecture/Presentation	Understanding the health planning process and developing health indicators
2	Lecture/Presentation	Understand the monitoring and evaluation
Tutorial 5		
6	CBL	MCH, E &OH, Health planning & Management
OSCE/OSPE Examination		
6	OSCE/OSPE exam	Based on Clinical attachment in Community and Family Medicine

Term 11		
Special Topics		
2	Lecture/ Presentation	Sustainable Development Goals
2	Lecture/ Presentation	Community based Elderly care, Palliative care, Rehabilitation health care
Tutorials 6		
3	CBL	Management of Common communicable disease conditions
3	CBL	Non Communicable diseases - Apply the prevention concept in the management of NCDs and analyse the challenges of handling NCDs
3	CBL	Evidence based medicine and clinical practices
3	CBL	MCH, Nutrition
3	CBL	E & OH related issues

Medical Sociology		
Term 5		
2	Lecture	Lecture Family, structure & Function
2	Lecture	Lecture Relationship between patient, family and community
1	Lecture	Importance of Medical Sociology in medical practice
1	Lecture	Health as Social Institution
1	Lecture	Health and Social Factors
1	Lecture	Role of the Family in Health
1	Lecture	Role of the community in Health
1	Lecture	Poverty and Health
1	Lecture	Doctor-Patient Relationship
1	Lecture	Issues in Doctor-Patient Relationship
1	Lecture	Globalisation
1	Lecture	Globalisation and Health

Term 6		
1	Lecture	Understanding the factors of suicide
1	Lecture	Prevention of Suicide
1	Lecture	Alcoholism and social issues
1	Lecture	Alcoholism and Social consequences in the family and community
2	Lecture	Gender Based Violence
1	Lecture	Domestic Violence
1	Lecture	Gender and Health
1	Lecture	Gender and Life Expectancy
1	Lecture	Child Abuse
1	Lecture	Ageing and social Gerontology
1	Lecture	Ageing and Social Consequences
2	Lecture	Disabilities and Social Consequences
10	Presentation	Selected topics in Medical Sociology
10	Field visit	Self-help groups of PWDs

5.12.5. Summary of Phase II

	Term 5	Term 6	Term 7	Term 8	Term 9	Term 10	Term 11	Total
Lecture	17	17	20	18	0	0	0	72
Lecture/ presentation				0	16	14	4	34
Tutorial/CBL	3	3	0	4	4	6	15	35
Field attachment		10	10	10	10	0	0	40
In-course				2				2
OSCE/OSPE						6		6
Clinical	0	60	60	60	60	0	0	240
Total	20	90	90	94	90	26	19	429

5.12.6. Evaluation

No	Type of Examination.	Distribution of Marks- First examination	Break down of Marks	Details of Evaluation.	Qualifying pass marks (%)
1	Community and Family Medicine Clinical Assessment	20	10	OSCE & OSPE	45 % for each component and total of 50%
			02	Attendance, Attitude and Application	
			03	Presentation	
			15	Portfolio Assessment (Single portfolio will be assessed for activity 1 & 2)	
2	Community Field component	20	05	Field assessment	
			05	Communication skills	
3	In-course Assessments	10	10	Conducted in Term8. This will be 2 essay questions & 20 MCQs	
4	End of course written paper.	40	20	3 hrs, 6 Essay questions.	
			20	60 MCQs	
5	Viva	10	10	20 min./student.	

Important Note

The Community and Family Medicine assessment has five components. Students must obtain more than 45% marks in each component to pass each component. They must also obtain a total of 50 marks to pass the subject. If the student fails to obtain 45% marks in a component (except for in-course assessments), the student is expected to sit for the component in the successive allowed attempt. If the student does not obtain total of 50 marks in the subject, after successfully passing all five components, they must sit for both the written and viva exam in the successive allowed attempt, in order to obtain 50 marks.

5.12.7. References:

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- Theory and Practice of Public Health. Hobson W. 5th Edition, Oxford: Oxford University Press.1980.
- Essentials of Family Medicine. 6th edition, Edited by: Slone DP et al, Philadelphia: Lippincott, 2011.
- SLMA guidelines and Information on vaccines. Sri Lanka Medical Association, Colombo, 2008.

5.13. Pathology

[Person in Charge- Head Pathology]

5.13.1. Description

The aim of the course is to provide required knowledge to work out the various pathological process of diseases encountered in medical practice, to apply this knowledge to diseases in relation to the systems of the body and to develop skills to interpret common pathological laboratory reports encountered in clinical practice and to correlate the results with the pathological process.

At the end of the course the students should

1. Possesses adequate knowledge to describe pathogenesis of disease process, explain the clinicopathological features, explain complications and seqaule in a pathological background of the diseases encountered in medical practice in relation to respiratory, cardiovascular , alimentary, musculo-skeletal, urinary , endocrine, reproductive, nervous and lympho-reticular-haematological system.

2.Develop skills to

- Perform basic diagnostic tests
- Determine and explain the rationale for the selection of laboratory and other investigations relevant to the diseases encountered in medical practice in relation to respiratory, cardiovascular, alimentary, musculo-skeletal system, urinary, endocrine, reproductive, nervous and lympho-reticular-haematological system.
- Outline the laboratory procedures for investigation of patients and reporting by the pathologist.

The teaching / learning activities includes lectures, tutorials, Clinicopathological correlation (CPC), museum demonstrations and histopathology slide demonstrations. Students are posted to the pathology laboratory of the teaching hospital for 2 weeks in small groups to learn the laboratory procedures.

Learning objectives of CPCs:

1) Revision of the pathology of the important (common and/ or serious) diseases of the organ system, in the clinical context.

2) Understanding how the underlying pathology determines the patient's symptoms and signs and results of investigations.

3) Being able to work out a rational differential diagnosis by correlating the patient's symptoms and signs and results of investigations with the pathophysiology of common diseases of this and other relevant organ systems

Assessments:

Evaluation in pathology consists of continuous and end of course assessments:

Continuous assessments include two in-course assessments. In-course assessment can be a written examination (structured essay (SEQ), single response and multiple choice questions (SRQ/MCQ)) and OSPE.

End of course examination includes written examinations consist of SEQ/MCQ/SRQ and OSPE. Written examinations mainly assess the knowledge. Skills are assessed in OSPE.

Students should obtain total of 50% or more marks and qualifying marks (45%) in theory.

The course contributes number 1,2,3,4,8,10 of the intended learning outcomes of medical degree program.

5.13.2. Intended Learning Objectives

Section	Intended learning objectives
General pathology	Introduce core knowledge in Pathology. Enable the student to understand the mechanism and basic tissue changes that occur due to disease in the human body At the end of this section students should be able to: • Illustrate the basic procedures done in a laboratory, specimen collection and transport • Explain the causes, mechanism morphological features and effects of cell injury • Classify the types of cellular adaptation and understand the mechanism of each types of cellular adaptation • Distinguish the differences between physiological & pathological adaptation and cellular adaptation in various system with examples • Elaborate necrosis. Enumerate the types, morphology and clinical features of necrosis • Define apoptosis. Describe basic cellular changes of apoptosis • Distinguish necrosis from apoptosis • Define gangrene, its types and list the different causes of gangrene • Define acute inflammation, • Enumerate the cardinal features and describe the pathological basis of them. • List the difference between exudates and transudates. • describe the outcomes of acute inflammation • List the main chemical mediators. Describe their role and effects in acute inflammation. • List the advantages and harmful effects of acute inflammation • Define & describe the characteristic features of chronic inflammation • List the differences between acute and chronic inflammation • List the cells involved and discuss the role of macrophages in chronic inflammation • Define granuloma and briefly describe important granulomatous diseases • Distinguish the effects of chronic inflammation

	• List the types of healing. Describe the process healing of a clean incised wound and a large infected wound • Distinguish the complications of wound healing • List the factors that modify wound healing • Define and describe the pathogenesis and effects of pathological calcification. • List different types of pigments and sites of deposition. • Define thrombosis. Describe the risk /predisposing factors, morphological changes and outcomes of thrombosis • Define embolism. • List different types of embolism and describe the pathogenesis, morphological changes and clinical effects of different types of embolism. • Define ischaemia/ infarction. List the causes, types and examples. Describe the pathological changes, and outcome of ischaemia and infarction. • Elaborate the causes, sites and effects of venous congestion. • Distinguish various types, causes and pathogenesis of oedema. Recall the differences between exudates and transudates • Define shock. List the types, pathogenesis and morphological features of shock.
Environmental disease	• Apply different types of physical and chemical agents and their effects on various system (e.g.: alcohol. Smoking, radiation) • Distinguish various nutritional disorders and risk factors (malnutrition, obesity, metabolic syndrome)
Neoplasia	• Explain the prevalence & risk factors of malignancies • Define neoplasia and classify the tumours • Explain the morphological features of benign and malignant neoplasms • List the different types of carcinogens, and cancer causing genes. • Illustrate the process of carcinogenesis with examples • Elaborate the cancer spread (definition of metastasis) • Apply the effects of tumour on the host—local and distant • Explain the screening and laboratory diagnosis of cancer. • List the prognostic factors in cancer and outline the management of cancer.
Clinical Pathology	• List various types of specimens. Understand the collection, storage and transport of various specimen. • Distinguish the factors influencing biochemical values • List and identify various laboratory errors • Interpret basic laboratory reports and correlate the abnormalities with the disease condition

Urinary system and Male genital system	• Explain the pathogenesis & pathophysiology of glomerular diseases and List types of glomerulonephritis and understand the morphological changes in each type.
	• Define nephrotic and nephritic syndrome
	• Explain the causes and pathogenesis of nephrotic and nephritic syndrome. Describe the clinical presentation and its complications.
	• list the investigations of nephrotic and nephritic syndrome.
	• Illustrate the aetiology, pathogenesis and clinical features of tubular and interstitial diseases.
	• Define acute and chronic renal failure. List the aetiological /risk factors / causes and discuss the pathophysiology. Describe the clinical features and complications.
	• Distinguish the difference between acute and chronic renal failure and discuss the panel of investigations
	• Classify and describe the aetiology and pathogenesis of UTI. Describe the clinical features, complications and morphology of upper urinary tract infection.
	• List the causes of urinary tract obstruction. Describe the types, causes, pathogenesis and investigations of urinary calculi.
	• Explain the clinical and pathological changes that occurs due to acute and chronic urinary tract obstruction
	• Elucidate the renal involvement of various systemic diseases
	• Explain briefly the pathology of renal and urothelial tumours and cystic diseases of the kidney.
	• List the biochemical investigations performed in renal diseases.
	• Differentiate common acid base disorders, water and electrolyte imbalance and list common causes. Interpret the blood gas analysis and electrolytes repoerts.
	• List the common disorders of the penis, scrotum and testes
	• Apply the clinical presentation, and diagnosis of benign prostatic hyperplasia and prostatic cancer
	• Explain the clinicopathological correlation and differential diagnosis of the following conditions
	  ○ Nephritic / nephrotic syndrome
	  ○ Acute pyelonephritis
	  ○ Renal colic due to calculi
	  ○ Hydronephrosis
	  ○ Renal cell carcinoma
	  ○ Transitional cell carcinoma of bladder
	  ○ Prostatic adenocarcinoma
	  ○ Testicular torsion

Cardiovascular system	• List the diseases of arteries, veins and lymphatics and describe the pathological process.
	  o Understand Arteriolosclerosis,
	  o Define atherosclerosis. Discuss the pathogenesis and Complications of atherosclerosis-PVD, CVA, aneurysm
	  o Discuss the pathogenesis and complications of Vasculitis
	  o Define aneurysm. Describe the causes, types, the pathogenesis, clinical features, and complications of Aneurysms.
	• Distinguish the risk factors, pathogenesis, clinical manifestations and the investigations used in IHD.
	• Explain the pathological changes and complications of IHD
	• Define and classify the hypertension. Describe the risk/ contributing factors/predisposing factors of hypertension
	• Enumerate the causes of secondary hypertension
	• Explain the pathological changes of hypertension in following organs - Heart , brain, kidney, blood vessels and eye
	• Explain the clinical features, investigation and complications of hypertension
	• Define heart failure, and list the types and the causes.
	• Relate the pathogenesis and clinical features of heart failure.
	• Explain the aetiology, pathogenesis, the clinical features, investigations and diagnosis of rheumatic fever.
	• Distinguish the morphology , the complications and sequelae of rheumatic fever
	• Apply the aetiology, types, pathogenesis, the clinical features, investigations and diagnosis of infective endocarditis.
	• Illustrate the pathological changes, complications and differential diagnosis of vegetation in infective endocarditis (SLE Nonbacterial) endocarditis.
	• List the causes and describe the clinical manifestations, and the complications of myocarditis.
	• Define and List the types and causes of cardiomyopathy. Discuss the clinical features and the pathology of cardiomyopathy.
	• List the primary and secondary tumours of the heart
	• Explain the clinical presentation of pericardial disease.Describe the types, causes of pericarditis / pericardial effusion and investigations of pericardial diseases.
	• List the clinical features and causes of cardiac tamponade.
	• Illustrate the clinicopathological correlation and differential diagnosis of the following conditions
	  o Acute myocardial infarction (STEMI)
	  o Myocarditis

	○ Hypertrophic cardiomyopathy ○ Congestive cardiac failure ○ Infective endocarditis ○ Rheumatic heart disease ○ Abdominal aortic aneurysm and Peripheral Vascular Disease ○ Cardiac tamponade
Respiratory system	• Define COPD/ Bronchial asthma / bronchiectasis and atelectasis. • Summarise the aetiology, pathogenesis , pathology, clinical features, diagnosis and complications of COPD/ Bronchial asthma / bronchiectasis and atelectasis • Explain interstitial lung disease: ○ Define adult respiratory distress syndrome. List the causes, precipitating factors, pathophysiological basis and criteria for the diagnosis ○ Definition, Pathophysiology, diagnosis of infiltrative lung disease-hypersensitivity pneumonitis and pneumoconiosis. • Classify lung infection- pneumonias, aspiration pneumonia, lung abscess, tuberculosis. • Explain the pathogenesis, pathological changes, clinical features, investigations and complications of lung infection • Enumerate and briefly describe the pathogenesis, pathology, clinical features and complications of pulmonary diseases of vascular origin • Classify lung tumours and enumerate the risk /aetiological factors • Distinguish the pathological changes, clinical features and investigations of lung tumour • List and brief out pleural diseases and mediastinal neoplasm. • List the diseases of upper respiratory tract disorders-neoplastic and non-neoplastic • Explain the clinicopathological correlation and differential diagnosis of the following conditions ○ Pneumonia/ consolidation ○ Idiopathic pulmonary fibrosis ○ Pleural effusion and lung cancer ○ Acute asthma ○ TB ○ Chronic bronchitis ○ Pulmonary oedema ○ Pulmonary embolus and lung infarction

Alimentary system	• List the different diseases of oral cavity, tongue and salivary glands-infection, ulcers, neoplasia • Explain briefly the aetiology, clinical features, diagnosis, prevention of benign & malignant lesions of the oral cavity and tongue • List the aetiologies and clinical features of tumours of the salivary gland • List the diseases of the oesophagus and stomach- congenital, inflammatory and neoplastic o List the risk factors of oesophageal carcinoma and describe the clinical manifestations, pathological features and the diagnosis of oesophageal carcinoma o List the predisposing conditions and describe the pathogenesis, the clinical features, the pathological changes and complications of gastro-oesophageal reflux o Define Barrett's oesophagus and describe the morphology and the complications of Barrett's oesophagus o Explain the causes of peptic ulcer disease (including *Helicobacter pylori*.).Describe Clinical features, pathogenesis, morphology, investigation and complications of peptic ulcer disease. o Define and classify gastritis. Describe the causes /risk factors, clinical manifestations and the complications of gastritis o Illustrate the prevalence, causes, clinical presentation, morphological changes, staging and prognosis of gastric carcinoma • List the causes and describe the clinical features, the morphological changes, the investigations and the complications of infective and non-infective diarrhea and malabsorption • Classify inflammatory bowel disease. Compare and describe the differences of UC and CD in the following context: the epidemiology, the clinical features, site of involvement, morphological changes investigations and extra intestinal manifestations of IBD. • Apply the clinical features, differential diagnosis, pathogenesis, morphology and complications of acute appendicitis. • List the causes and describe the pathogenesis, clinical features, and investigations of small and large intestinal obstruction. • Explain pathogenesis, clinical features and morphology of vascular disorders of the intestine.

	• Explain the risk factors, pathogenesis morphological features, clinical features, staging & metastasis, and investigation & diagnosis of neoplastic diseases of the intestine: o Polyps (Define and classify intestinal polyps. Explain the polyposis syndromes and mode of inheritance) o FAP (Understand the malignant potential of polyps & polyposis syndromes) o Colorectal carcinoma. o Carcinoid tumours • Illustrate the causes and pattern of liver injury. • List the causes of hepatitis- infective and non-infective. o Viral hepatitis/ liver abscess- describe the epidemiology, the clinical features, the pathological changes and laboratory diagnosis • Define and list the causes, clinical features, the morphological changes, the investigations and the complications of acute liver failure • Define chronic liver disease. List the causes and describe clinical features, morphological features, investigations and complications of chronic liver disease in the following conditions o Alcoholic liver disease o Nonalcoholic fatty liver disease o Infective o Hereditary • Explain the pathophysiology and pathogenesis of liver cirrhosis. List the risk factors, clinical manifestation and describe the complications, morphological changes and investigations of cirrhosis. • Identify the risk factors and pathogenesis of liver tumours. Identify the pathological features of liver tumours. Differentiate primary and secondary liver tumours. • List the types and classify the jaundice. Describe the risk factors/ causes, pathogenesis and investigations of different types of jaundice. • List and interpret various liver function tests • List the diseases and the causes of intra and extrahepatic bile ducts and gall bladder. o PBC, PSC, acute and chronic cholecystitis. o Gall stone- Pathophysiology of formation of gall stones, predisposing /risk factors, clinical manifestations and Investigations of symptomatic gall stone, bile duct stones and asymptomatic gall stones.

	• Define acute pancreatitis .List causes and describe clinical features, morphological changes and investigations of acute pancreatitis • List the causes, clinical presentation, morphological features and complications of chronic pancreatitis • Explain the Pathogenesis, clinical presentation, morphological features and the diagnosis of pancreatic neoplasm • Summarise the clinicopathological correlation and differential diagnosis of the following conditions o Gastro-oesophageal junctional adenocarcinoma o Helicobacter pylori gastric ulcer o Typhoid disease o Crohn's disease o Adenocarcinoma of large bowel o Hepatic failure with cirrhosis o Acute cholecystitis due to gallstones o Pancreatic adenocarcinoma
Musculoskeletal system and Skin	• Explain the events in fracture healing, morphological changes and complications of fracture healing • Illustrate the pathogenesis, causes, clinical presentation and investigations of bone & joint infections / inflammation – acute and chronic osteomyelitis, arthritis • Classify and describe the causes, pathogenesis, clinical features, investigations and pathological features of different metabolic disorders of bone-osteoporosis, osteomalacia and rickets • Classify & briefly describe the morphological features, clinical presentation, investigations, & prognosis of common bone tumour • Classify and list main causes of arthritis. Discuss the clinical features and diagnosis of arthritis and soft tissue diseases. • List the common non-infective skin lesion-eczema, psoriasis. • List the common benign, pre malignant and malignant lesions of skin • Explain the clinical features and diagnosis of benign, pre malignant and malignant lesions of skin.
Endocrine system	• List the disorders of anterior and posterior pituitary hormones-hypopituitarism and hyperpituitarism • Elaborate the clinical manifestations and investigations of pituitary hypofunction /hyperfunction in children and adults • Interpret the relevant laboratory investigations.

	• Apply the clinical manifestations and diagnosis of pituitary tumours. • Classify and define goitre. • Explain the causes, pathogenesis, morphological features and clinical features of different types of goitre • Interpret the relevant investigations in patient with a thyroid disorder • Distinguish the causes, pathogenesis, clinical manifestations, complications and relevant investigations of hypothyroidism and hyperthyroidism. • Classify and describe morphological appearance and investigations of thyroid neoplasm • Apply the clinical manifestations of diseases of the parathyroid gland and disorders of calcium metabolism. Describe briefly the relevant investigations in the diagnosis of parathyroid disorders. • List different adrenal gland disorders. -Cushing's syndrome, Addison's disease, Pheochromocytoma and Conn's syndrome, CAH • Explain the clinical manifestations and investigations of different adrenal gland disorders • Distinguish the classification, aetiology, pathogenesis and the clinical presentations of diabetes mellitus. • List diagnostic criteria and the laboratory diagnosis of diabetes mellitus and investigation of acute diabetic emergencies: diabetic ketoacidosis, hyperosmolar non-ketotic coma (HONK) and hypoglycaemia. • Outline the long-term complications of diabetes and screening
Female genital system	• List and describe common vulval, vaginal and cervical disorders. • Explain the causes/aetiology, pathogenesis and screening and diagnosis of premalignant and malignant neoplasm of vulva, vagina and cervix. • Illustrate and briefly describe the various endometrial and myometrial disorders. • List the cause / risk factors, pathogenesis, clinical features, morphological features and diagnosis of endometrial hyperplasia, endometrial and myometrial tumours, • List the disease conditions of fallopian tubes • Explain the non-neoplastic and cystic lesions of the ovary. • Distinguish the histological classification, investigation and pathological features of ovarian tumours

	• List and briefly describe the diseases of placenta:-gestational trophoblastic disease, choriocarcinoma • Illustrate the aetiology / risk factors, pathogenesis, clinical presentation and investigations of common benign and malignant breast diseases. • Apply the clinicopathological correlation and differential diagnosis of the following conditions o Squamous cell carcinoma of cervix with CIN. o Endometrioid adenocarcinoma of endometrium o Multiple uterine fibroids (leiomyomas) o Serous tubo-ovarian carcinoma o Ovarian teratoma o Complete hydatidiform mole complicated by choriocarcinoma o Fibroadenoma of breast o Carcinoma of breast
Nervous system	• Explain the causes & clinical presentation of hydrocephalus and cerebral oedema • Illustrate the features of increased intra cranial pressure & herniation • List the infections of the nervous system- Meningitis and cerebral abscess, encephalitis. • List the aetiology, pathogenesis, pathological features, complications and lab diagnosis of infections of the nervous system. • Define cerebrovascular events. • List the types and risk factors / causes of CVD • Explain the pathophysiology of infarcts and haemorrhages • Classify and describe the clinical& pathological effects of CNS tumour
Lympho-reticular and haematological disorders	• Summarise the differential diagnosis of splenomegaly and lymphadenopathy • Define and Classify, different histological, Clinical features and investigations of lymphoma • List common thymus disorders • Distinguish the site and regulatory factors of formation of blood cells • Define and classify the anaemia. Describe general clinical features, complications and laboratory findings of anaemia. • Explain the causes, clinical features, lab diagnosis of iron deficiency anamia and megaloblastic anaemia

	• Define and classify the clinical features and laboratory Investigations of aplastic anaemia and anaemia of chronic diseases (including CKD). • Define and classify clinical features of Intra vascular and Extra vascular haemolysis. Investigations for evidence and diagnosis of Haemolysis • Explain the common haelmolytic anaemias- pathogenesis, clinical features, and laboratory diagnosis. • Illustrate the pathogenesis, clinical features, and laboratory diagnosis of haemoglobinopathies- thalassaemia and SC anaemia • Define and classify clinical features and diagnosis of different myeloproliferative neoplasm- PV,ET,MF and secondary polycythemia- • Explain the haematological malignancies- AML / MDS and ALL – definition, classification, pathogenesis, clinical features and diagnosis. • Summarise the malignant plasma cell proliferation – definition, classification, pathogenesis, clinical features, complications and diagnosis. • List the types and causes of bleeding. • List different laboratory tests and management of primary, secondary, tertiary and acquired (CLCD,/DIC/CKD/Drugs relatd) coagulation defects • Define & outline the causes and Discuss the clinical manifestations and diagnosis of thrombocytopenia • Outline the classification and briefly describe the pathogenesis, clinical features, complications and laboratory diagnosis of coagulation disorders- Haemophilia/ vWD (hereditary and acquired) • Test blood grouping. • Explain the mechanisms, clinical features,and laboratory diagnosis of haemolytic transfusion reactions and hemolytic disease of new born • Illustrate the stem cell transplant.

5.13.3. Detailed Syllabus

General Pathology		
Term 5 (L-14, T-4,P-2)		
		General pathology (non-neoplastic)
1	Lecture	Introduction to pathology
3	Lecture	Cell injury, cell adaptation (including depositions), cell death (including necrosis and gangrene)
2	Lecture	Acute Inflammation
2	Lecture	Chronic Inflammation
2	Lecture	Repair, Regeneration, wound healing
2	Lecture	Thrombosis and Embolism, infarction
1	Lecture	Oedema, congestion, exudates and transudates
1	Lecture	Shock
1x4G	Tutorial	Cell injury, cell adaptation (including depositions), cell death (including necrosis and gangrene)
1x4G	Tutorial	Inflammation, repair, regeneration and wound healing
1x4G	Tutorial	Thrombosis, embolism, infarction,
1x4G	Tutorial	oedema, congestion, exudates, transudates, shock
2x4G	Practicals	Non-neoplastic general pathology

Term 6 (Env-L-4, Neo-L-9,T-2,P-3)		
		Environmental disease
1	Lecture	Injury by chemical agents, effects of tobacco and effects of alcohol
1	Lecture	Injury by physical agents- mechanical, thermal, electrical injury and ionizing radiation
2	Lecture	Nutritional diseases - malnutrition, obesity and metabolic syndrome
		Neoplasia
1	Lecture	Cancer classification and nomenclature
2	lecture	Molecular basis of cancer
2	Lecture	Risk factors for cancer and epidemiology
1	Lecture	Cancer spread - molecular, histopathology & clinical
1	Lecture	Immunological aspects of cancer
1	Lecture	Diagnosis and screening of cancer
1	Lecture	Prognostic factors in cancer & Management of cancer
2x4G	Tutorial	
3x4G	Practicals	Cancer microscopy and macroscopy

Systemic Pathology		
Term 7 (L-19,T-4,P-6,M-2,CPC-4)		
		Clinical Pathology:L-6.T-1,P-3)
1	Lecture	Introduction to Clinical Pathology
1	Lecture	Biological rhythms and factors influencing biochemical values.
1	lecture	Collection , storage and transport of various types of specimen (blood, urine, other body fluids, histology, cytology and frozen section)
1	Lecture	Identification of laboratory errors
2	Lecture	Interpreting laboratory reports (urine and body fluids and CSF, Lipids, proteins and Enzymes in clinical medicine)
1x4G	Tutorials	Specimen collection, identification and transport pan-pathology
3x4G	Practical	Chemical pathology - CSF, blood enzymes, hormones
		Urinary System(L-11,T-2,P-2,M-1)
2	Lecture	Glomerulonephritis (including pathogenesis)
1	Lecture	Nephrotic syndrome & Nephritic syndrome
2	Lecture	Tubulointestitial disease and Renal failure
1	Lecture	Kidney in systemic diseases
2	Lecture	Cystitis, pyelonephritis, urinary calculi, hydronephrosis
1	Lecture	Cystic diseases of the kidney and tumours of the urinary system
1	Lecture	Renal function tests and urine biochemistry
1	Lecture	Acid - base, water and electrolyte balance
2x4G	Tutorial	Urinary System
1x4G	**Museum** Demonstration	Urinary system macroscopy
2x4G	Practical	1.Urinary system microscopy 2.Renal function tests and urine biochemistry
		Male genital system(L-2,T-1,P-1,M-1,CPC-4)
1	Lecture	Penile conditions, Scrotum, testis and epididimis
1	Lecture	Prostate - nodular hyperplasia and carcinoma
1	Tutorial	Male genital system
1x4G	Museum Demonstration	Male genital system
1x4G	Practical	Male genital system- microscopic pathology
4	CPC	Clinico pathological correlation :Urinary system combined with MGS-(Nephritic syndrome, Acute pyelonephritis, Renal colic due to calculi, Hydronephrosis, Renal cell carcinoma, Transitional cell carcinoma of bladder, Prostatic adenocarcinoma,Testicular torsion)

Term 8 (L-22,T-6,P-2,M-2,CPC-8)		
		Cardiovascular System: (L-11, T-3,P-1,M-1,CPC-4)
1	Lecture	Vasculitides and diseases of veins and lymphatics
1	Lecture	Atherosclerosis - pathogenesis
1	Lecture	Atherosclerosis - peripheral vascular disease, cerebrovascular disease. Aneurysms.
2	Lecture	Ischaemic heart disease
1	Lecture	Hypertension - cardiac, cerebral, renal and ocular disease
1	Lecture	Left and right heart failure / Cor-pulmonale
2	Lecture	Valvular heart disease including rheumatic heart disease and infective endocarditis
1	Lecture	Myocardial diseases - myocarditis, cardiomyopathy and neoplasia
1	Lecture	Diseases of the pericardium
3x4G	Tutorial	
1x4G	**Museum** Demonstration	
1x4G	Practical	
4	CPC	Acute myocardial infarction (STEMI), Myocarditis, Hypertrophic cardiomyopathy, Congestive cardiac failure, Infective endocarditis, Rheumatic heart disease, Abdominal aortic aneurysm and Peripheral Vascular Disease ,Cardiac tamponade
		Respiratory System (L-11,T-3,P-1,M-1,CPC-4)
1	Lecture	Chronic bronchitis and emphysema (COPD)
1	Lecture	Asthma, bronchiectasis and atelectasis
1	Lecture	Interstitial Lung Disease including ARDS ; infiltrative lung diseases, including hypersensitivity pneumonitis and pneumoconiosis
2	Lecture	Lung infections except TB (including pneumonia, aspiration pneumonia and lung abscess)
2	Lecture	Tuberculosis
1	Lecture	Pulmonary disease of vascular origin-Pulmonary thromboembolism, haemorrhage and infarction, Pulmonary hypertension and vascular sclerosis
1	Lecture	Lung neoplasms
1	Lecture	Pleura and mediastinal neoplasms
1	Lecture	Upper respiratory tract
3x4G	Tutorials	
1x4G	Demonstration	**Museum**
1x4G	Practical	
4	CPC	Clinico-pathological correlation of the following conditions- consolidation, collapse, fibrosis, pleural effusion, pneumothorax, lung cavity, solid mass, pulmonary oedema, pulmonary embolism and lung infarction

Term 9 (L-33,T-4,P-4,M-2,CPC-4)		
		Alimentary System: (L-23,T-3,P-2,M-2,CPC-4)
1	Lecture	Diseases of the oral cavity, tongue and salivary glands
2	Lecture	Diseases of the oesophagus and stomach - congenital, inflammatory and neoplastic
1	Lecture	Diarrhoea and malabsorption
1	Lecture	Infections of the GIT
2	Lecture	Coeliac disease, microscopic colitis and Inflammatory Bowel Disease and appendicitis
1	Lecture	Congenital abnormalities and Obstruction of Small and large Intestines
1	Lecture	Vascular disorders of the intestines
2	Lecture	Neoplastic diseases of the intestines
1	Lecture	Patterns of injury of the liver & common causes, chronic
3	Lecture	Hepatitis, hepatic necrosis, acute &chronic liver failure and cirrhosis
1	Lecture	Alcoholic liver disease, non-alcoholic fatty liver disease and vascular disorders of liver
1	Lecture	Liver hyperplasia and neoplasia
2	Lecture	Liver Function Tests and jaundice
2	Lecture	Diseases of the intrahepatic and extrahepatic bile ducts; diseases of the gallbladder
2	Lecture	Exocrine Pancreas
3x4G	Tutorial	1.GIT pathology 2.Liver, gallbladder, bile duct and pancreas pathology
2x4G	Museum Demonstration	GIT and liver macroscopic pathology
2x4G	Practical	GIT and liver microscopic pathology
4	CPC	Gastro-oesophageal junctional adenocarcinoma, Helicobacter pylori gastric ulcer, Typhoid disease, Crohn's disease, Adenocarcinoma of large bowel, Hepatic failure with cirrhosis, Acute cholecystitis due to gallstones, Pancreatic adenocarcinoma.
		Musculo Skeletal System(L-7,T-1,P-2)
2	Lecture	Fracture(injury and Repair), Inflammation of bone
2	Lecture	Metabolic disorders of bone including Osteoporosis and Osteomalacia and Rickets
2	Lecture	Born Tumours.
1	Lecture	Diseases of Joints and soft tissues including muscle
		SKIN (L-3)
3	Lecture	Common non-infective skin pathology - eczema, psoriasis, melanocytic lesions, carcinoma
2x4G	Practical	Bone, joint, soft tissue and skin pathology
1x4G	Tutorial	Bone, joint, soft tissue and skin pathology

Term 10 (L-19,T-2,P-4,M-1,CPC-4)		
		Endocrine disease (L-11,T-1,P-2)
1	Lecture	Diseases of the pituitary gland and pituitary hormones
3	Lecture	Diseases of the thyroid gland and thyroid function tests
1	Lecture	Diseases of the parathyroid glands and calcium metabolism
2	Lecture	Diseases of the adrenal glands and adrenal hormones
3	Lecture	Diseases of the endocrine pancreas including diabetes mellitus
1	Lecture	Laboratory diagnosis of endocrine diseases
2x4G	Practical	**Histopathology**
1x4G	Tutorials	
		Female genital system(L-8,T-1,P-2,M-1,CPC-4)
1	Lecture	Diseases of the vulva, vagina and cervix
2	Lecture	Diseases of the endometrium and myometrium
1	Lecture	Diseases of the fallopian tubes and ovaries
1	Lecture	Diseases of the placenta
3	Lecture	Diseases of the breast
1x4G	Tutorials	
2x4G	Practicals	
1x4G	Museum demonstration	
4	CPC	Squamous cell carcinoma of cervix with CIN, Endometrioid adenocarcinoma of endometrium, Multiple uterine fibroids (leiomyomas), Serous tubo-ovarian carcinoma, Ovarian teratoma, Complete hydatidiform mole complicated by choriocarcinoma, Fibroadenoma of breast, Carcinoma of breast

Term 11(L-26,T-5,P-8)		
		Nervous System (L-4,T-1,P-2)
1	Lecture	Hydrocephalus, cerebral oedema and traumatic brain injury
1	Lecture	Cerebral ischaemia, infarction and haemorrhage; hypertensive brain disease
1	Lecture	Meningitis, encephalitis and brain abscess
1	Lecture	Intracranial tumours
1x4G	Tutorial	CNS pathology
2x4G	Practical	CNS pathology (macroscopic and microscopic)
		Lympho Reticular Tissue and haematological disorders (L-22,T-4,P-6)
2	Lecture	Diseases of Spleen, Differential diagnosis of Lymphadenopathy and lymphomas
1	Lecture	Diseases of Thymus
1	Lecture	Sites of formation of blood cells and their development
1	Lecture	General discussion of anaemias / Classification
1	Lecture	Iron deficiency anaemias
1	Lecture	Megaloblastic anaemias
1	Lecture	Aplastic anaemia
1	Lecture	Anaemia of chronic disease and CKD
1	Lecture	Introduction to haemolytic anaemia
1	Lecture	AIHA/ HS/ G6PD deficiency anaemia
1	Lecture	Haemoglobinopathy-Mainly Thalasaemia and also SC
2	Lecture	Myeloproliferative neoplasm- Introduction, PV, ET,MF and II^{ry} Polycythemia
1	Lecture	AML/ MDS and ALL
1	Lecture	Malignant plasma cell proliferations,
2	Lecture	Coagulation-Introduction, I^{ry}, II^{ry}, III^{ry}/ Investigations /Management and acquird defects-CLCD/DIC/CKD/Drugs related
1	Lecture	PLT/ vWD/ Haemophilia
2	Lecture	Blood grouping/acute haemolytic transfusion reaction / HDN
1	Lecture	Stem cell transplant
6x4G	Practicals	1.Blood cell morphology-IDA,VB12 ,HS, Thalas, SCD 2.WBC-Leukumoidreaction,Left shift, toxic granules, blast 3.FBC-Interpretation 4.Coagulation interpretation 5. Manual heamatocrit – Capillary/wintrobe, ESR, Osmortic fragility Test, Reticount 6.Grouping & Cross matching
4x4G	Tutorial	1.Anaemia(deficiency, ACD/CKD) 2.Haemolitic diseases 3.Neoplasia- AML, MPN, ALL 4.Coagulation

5.13.4. Summary

Pathology								
	Term 5	Term 6	Term 7	Term 8	Term 9	Term 10	Term 11	Total
Total Lectures	14	13	19	22	33	19	26	146
Practical-Histopathology Slides/ Haematology/ Chemical Pathology	2	3	6	2	4	4	8	29
Museum Demonstration	0	0	2	2	2	1		07
Tutorials	4	2	4	6	4	2	5	27
CPC			4	8	4	4		20
Clinical appointments								48
Total	20`	18	35	40	47	30	39	277

5.13.5. Evaluation

	Type of Examination	**Distribution of Marks- First examination**	**Distribution of Marks- subsequent examinations**	**Details of evaluation**	**Qualifying pass marks (%)**
1.	In- course assessment	20	-	2 In-course assessment	-
2.	End of course assessment	80	100		
2.1	**Theory**				
2.1.1	Structured essay Question (SEQ)	30	40	10 Q -3hrs	45 % in Theory
2.1.2	Multiple Choice Question (MCQ)	20	25	40 Q-2hrs	
2.1.3	Single Response question (SRQ)	10	15	20 Q -1hr	
3	**Practical/ spot**				
3.1	OSPE- Histopathology	8	8	8 station x2min	-
3.2	OSPE - Haematology	6	6	6 station x 2min	-
3.3	OSPE- Chemical Pathology	6	6	6 station x 2min	-

5.13.6. References

1. Robbin's Basic Pathology. Kumar V., Abul K Abbas, Nelson Fausto and Richard Mitchell., 10th edition, Saunders, 2007.

2. Oxford Text book of Pathology. McGee, J.O.D, Isaacson, P.G., Wright, N.A, Oxford: Oxford University Press, 1992.

3. Muir's Text book of Pathology. Robin Reid[et-al], 14th edition, Hodder Arnold, 2006.

4. Walter and Israel General Pathology. Walter J.B., and Talbot I.C, 7th edition, New York: Churchill Livingstone, 2006.

5. Aids to Pathology. Michael F Dixon and Philip Quirke, 3rd edition, Edinburgh: Churchill Livingstone, 1986.

6. Essential Hematology. Victor Hoffbrand, Paul Moss and John Pettit,Blackwells, 5th edition, 2006.

7. Diagnostic Function tests in chemical pathology. Lascelles, P. T and Donaldson, D, Springer, 1990

5.14. Clinical Pharmacology and Therapeutics

[Person in Charge- Head Pharmacology]

5.14.1. Description

The aim of the course is to provide the required knowledge on medications, to develop skills related to using medicines and positive attitude towards rational use of medicines and safe prescribing.

5.14.2. Overall Objectives

- Possesses adequate knowledge on
    a. basic principles of clinical pharmacology
    b. mechanism of action, clinical applications, adverse effects and toxicities of drugs used in medicine
    c. the principles of drug therapy
    d. common diseases and their management
- Develop skills
    a. to translate pharmacological principles into clinical decision making
    b. in prescription writing
    c. in rational prescribing
    d. in reviewing prescriptions
    e. in adverse drug reaction monitoring and reporting
    f. to use latest technology in obtaining and delivering drug information
    g. in providing drug information to patients, peers, pharmacist, nurses and public
- Develop positive attitude towards
    a. rational use of medicines
    b. risk-benefit analysis
    c. safe prescribing
    d. balanced approach to the introduction of new drugs
    e. self-directed continuing medical education

Teaching / learning activities include lectures, bed side teaching/ demonstrations, small group discussions and interactive tutorials. Therapeutics lectures overlap with medicine giving clinical features of important illnesses and the basis of managing them. The students are assessed by in-course and end of course assessments.

Teaching and learning processes:

Lectures are interactive and are open for discussion. In small group discussion (SGD) students are expected work as small team under the supervision of facilitator/ lecturer. Bed side teaching (BST) is clinical oriented class conducted in the wards / demonstration rooms involving small group of students to demonstrate the practical aspects of drug therapy. Tutorial are open discussions in large/ small groups.

Each student is provided with a Study Guide in Clinical Pharmacology by the Department of Pharmacology and is expected to complete it during their pre-professorial appointments. Study Guide in Clinical Pharmacology promotes self-directed continuous learning and helps the students to develop the skills and attitudes related to drug use which include, dose calculation, drug delivery, drug information, prescribing, treatment of emergencies and common medical conditions, immunization, dose adjustment, antiseptics & disinfectants and adverse drug reaction monitoring and reporting. Submission of Study Guide within the stipulated time is a prerequisite for sitting for the end of course examination in Clinical Pharmacology and Therapeutics.

Assessments:

Evaluation in Clinical Pharmacology and Therapeutics comprises continuous and end of course assessments:
Continuous assessments include two in-course assessments and evaluation of Study Guide in Clinical Pharmacology. In-course assessment can be a written examination, assignment, Objective Structured Clinical Examination (OSCE) or viva voice. Clinical oriented learning is assessed by the evaluation of Study Guide in Clinical Pharmacology.

End of course examination includes written examination consist of structured essay, single best and multiple choice questions, Viva and OSCE. Written examinations mainly assess the knowledge. Skills are assessed in OSCE and evaluation of Study Guide while attitude is assessed in OSCE and Viva.

Students should obtain total of 50% or more marks and qualifying marks (45%) in theory and OSCE to pass Clinical Pharmacology and therapeutics.

The course contributes number 1, 2, 4, 7, 8, 9, 10 and 11 of the intended learning outcomes of medical degree programme.

Clinical Pharmacology and Therapeutics is taught under following sections;

1. General principles of clinical pharmacology
2. Immunopharmacology
3. Antimicrobials
4. Autonomic nervous system
5. Renal system
6. Cardiovascular system
7. Respiratory system
8. Alimentary system
9. Musculo-skeletal system
10. Endocrine system
11. Central nervous system
12. Miscellaneous

5.14.2. Intended learning outcomes

Section	Intended Leaning Outcome

General principles of clinical pharmacology	• Explain
	  ○ pharmacokinetics and pharmacodynamics
	  ○ dose response, dosage
	  ○ individual variation and chronic pharmacology
	  ○ drug interactions, over the counter drugs and therapeutic drug monitoring
	  ○ prescription writing, evidence based medicine & compliance
	  ○ essential drugs, drug regulation, drug information
	  ○ adverse drug reactions
	  ○ drug development and clinical trials
	  ○ paediatric and geriatric pharmacology
	• Demonstrate
	  ○ drug delivery
	  ○ prescription writing
	  ○ prescription in children and elderly
	  ○ adverse drug reaction monitoring and reporting
	• Develop positive attitude towards
	  ○ rational use of medicine in children and elderly
	  ○ safe prescribing in children and elderly

Immunopharmacology	• Explain
	  ○ mechanism of action, clinical applications and adverse effects of immune modulators
	  ○ vaccines and cold chain maintenance

Antimicrobials	• Explain
	  ○ mechanism of action, clinical applications and adverse effects of antibacterial, antiviral, antifungal, antiprotozoal and anthelminthic agents
	• Demonstrate skills in
	  ○ performing and interpreting skin sensitivity test
	  ○ drug information to patients on paediatric dosage forms and antituberculous drugs
	• Develop positive attitude towards
	  ○ rational use of antibiotics

Autonomic nervous system	• Explain ○ mechanism of action, clinical applications, adverse effects and toxicities of cholinomimetics, anticholinergics, sympathomimetics and sympatholytics

Renal system	• Explain
	  ○ mechanism of action, clinical applications and adverse effects of drugs acting on renin-angiotensin system and diuretics
	  ○ clinical presentation, diagnosis and management of urinary tract infection
	• Demonstrate skills in
	  ○ dose calculation and dose adjustment in renal failure
	  ○ prescribing in renal disease

Cardiovascular system	• Explain
	  ○ mechanism of action, clinical applications and adverse effects of drugs affecting coagulation, antianginal, antihypertensive, antiarrhythmic agents, drugs used in heart failure and lipid lowering agents
	  ○ clinical presentation, diagnosis and management of ischemic heart disease, myocardial infarction, hypertension, hypertensive emergencies, arrhythmias, acute and chronic heart failure
	• Demonstrate skills in
	  ○ dose calculation of dopamine / dobutamine
	  ○ providing drug information to patients on sublingual glyceryltrinitrate and warfarin
	• Develop positive attitude towards
	  ○ rational use of medicines in cardiovascular disorders
	  ○ balanced approach to the introduction of new drugs in cardiovascular disorders

Respiratory system	• Explain ○ mechanism of action, clinical applications and adverse effects of drugs antitussives, antihistamines and drugs used in asthma

	○ clinical presentation diagnosis and management of asthma, tuberculosis, pneumonia and lung abscess • Demonstrate skills in ○ inhalation techniques ○ providing drug information to patients on inhaled medications for asthma • Develop positive attitude towards ○ rational use of medicines in respiratory disorders
Alimentary system	• Explain ○ mechanism of action, clinical applications and adverse effects of drugs used in peptic ulcer disease, antiemetics, laxatives, antidiarrhoeal agents and drugs used in inflammatory bowel disease ○ clinical presentation diagnosis and management of peptic ulcer disease, typhoid fever, cholera, leptospirosis, brucellosis and amoebiasis • Demonstrate skills in ○ dose calculation of intravenous fluids and electrolytes ○ providing drug information to patients/ parents on oral rehydration salt ○ prescribing in liver disease • Develop positive attitude towards ○ rational use of antidiarrhoeal agents, and laxatives and medicines in peptic ulcer disease
Musculoskeletal system	• Explain ○ mechanism of action, clinical applications, adverse effects and toxicities of non-steroidal anti-inflammatory drugs (NSAIDs) and drugs used in rheumatoid arthritis an gout ○ clinical presentation diagnosis and management of rheumatoid arthritis and gout • Demonstrate skills in ○ dose calculation of paracetamol for children ○ providing drug information to patients on methotrexate and paracetamol for children • Develop positive attitude towards ○ rational use of NSAIDs
Endocrine system	• Illustrate ○ mechanism of action, clinical applications and adverse effects of posterior pituitary hormones, corticosteroids, insulin and other hypoglycaemic agents, thyroxine, antithyroid drugs, sex hormones and related drugs

	○ clinical presentation diagnosis and management of diabetes mellitus, diabetic ketoacidosis, thyroid dysfunctions, myxoedema and thyroid storm • Demonstrate skills in ○ demonstrating insulin injection techniques ○ dose calculation of oxytocin ○ providing drug information to patients on long-term corticosteroids, insulin and hormonal contraceptives • Develop positive attitude towards ○ risk benefit assessment of hormone replacement therapy ○ safe prescribing in pregnancy ○ balanced approach to the introduction of new drugs in diabetes mellitus
Central nervous system	• Illustrate ○ mechanism of action, clinical applications and adverse effects of anaesthetic agents, skeletal muscle relaxants, opioids and antagonists, psychotropic drugs, antiepileptic agents, drugs used in migraine and Parkinson's disease ○ clinical presentation diagnosis and management of epilepsy, status epilepticus, chronic headaches and migraine, myasthenia gravis and Parkinson's disease • Demonstrate skills in ○ providing drug information to patients on antiepileptic drugs • Develop positive attitude towards ○ risk benefit assessment in prescribing antiepileptic agents, hypnotics, opioids and psychotropic drugs
Miscellaneous	• Explain ○ mechanism of action, clinical applications and adverse effects of haemopoietic agents, vitamins and minerals, topical preparations and anticancer drugs • Develop positive attitude towards ○ rational use of nutritional supplements

5.14.2. Detailed Syllabus of Clinical Pharmacology and Therapeutics

Term 5			
		General principles of clinical pharmacology	
1	Lecture	Introduction to clinical pharmacology	Clinical Pharmacology
2	Lecture	Pharmacokinetics	Clinical Pharmacology
1	Lecture	Clinical pharmacokinetics	Clinical Pharmacology
1	Lecture	Routes of drug administration	Clinical Pharmacology
1	BST/ Demonstration	Routes of drug administration	
2	Lecture	Pharmacodynamics	Clinical Pharmacology
1	Lecture	Dose response and drug dosage	Clinical Pharmacology
1	Lecture	Individual variation and chronic pharmacology	Clinical Pharmacology
1	Lecture	Drug Interactions, over the counter drugs and therapeutic drug monitoring	Clinical Pharmacology
1	Lecture	Prescription writing, evidence based medicine & compliance	Clinical Pharmacology
1	Lecture	Essential drugs, drug regulation and drug information	Clinical Pharmacology
1	Lecture	Adverse drug reactions	Clinical Pharmacology
1	Lecture	Drug development and clinical trials	Clinical Pharmacology
1	Lecture	Paediatric and geriatric pharmacology	Clinical Pharmacology
2	Tutorials	General pharmacology	Clinical Pharmacology
1	SGD	Dose calculation and prescription writing	
1	SGD	Prescribing in children and elderly	

Term 6			
		Immunopharmacology	
2	Lecture	Immune modulators	Clinical Pharmacology
		Antimicrobials	Clinical Pharmacology
1	Lecture	Introduction to chemotherapy	Clinical Pharmacology
2	Lecture	Beta lactum antibiotics and other cell wall inhibitors	Clinical Pharmacology
2	Lecture	Aminoglycosides, macrolides, tetracycline and other protein synthesis inhibitors	Clinical Pharmacology
2	Lecture	Sulphonamides, quinolones, azoles and other antibiotics	Clinical Pharmacology
2	Lecture	Antimycobaterial agents	Clinical Pharmacology
1	Lecture	Antiamoebic agents	Clinical Pharmacology
2	Lecture	Antimalarial agents	Clinical Pharmacology
1	BST/ Demonstration	Penicillin sensitivity test	
1	BST/ Demonstration	Antiseptics and disinfectants	

Term 7			
1	Lecture	Antifungal and antihelminthic agents	Clinical Pharmacology
1	Lecture	Treatment of scabies and head & body lice	Clinical Pharmacology
2	Lecture	Antiviral agents	Clinical Pharmacology
2	Tutorial	Antimicrobials	
		Autonomic Nervous System	Clinical Pharmacology
1	Lecture	Cholinomimetics	Clinical Pharmacology
1	Lecture	Anticholinergics	Clinical Pharmacology
1	Lecture	Sympathomimetics	Clinical Pharmacology
1	Lecture	Sympatholytics	Clinical Pharmacology
1	Tutorial	Autonomic Nervous System	
		Renal system	Clinical Pharmacology
1	Lecture	Drugs acting on enin-angiotensin system	Clinical Pharmacology
2	Lecture	Diuretics	Clinical Pharmacology
1	Lecture	Urinary tract infection	Medicine & Therapeutics
1	SGD	Prescribing in renal failure	

Term 8			
		Cardiovascular System	Clinical Pharmacology
2	Lecture	Drugs used in coagulation disorders	Clinical Pharmacology
1	Lecture	Antianginal agents	Clinical Pharmacology
2	Lecture	Antihypertensive agents	Clinical Pharmacology
1	Lecture	Drugs used in heart failure	Clinical Pharmacology
2	Lecture	Antiarrhythmic agents	Clinical Pharmacology
1	Lecture	Lipids lowering agents	Clinical Pharmacology
		Disorders of cardiovascular system:	
2	Lecture	Coronary artery diseases and myocardial infarction	Medicine & Therapeutics
2	Lecture	Hypertension and hypertensive emergencies	Medicine & Therapeutics
1	Lecture	Acute and chronic heart failure	Medicine & Therapeutics
2	Lecture	Arrhythmias	Medicine & Therapeutics
1	lecture	Endocarditis	Medicine & Therapeutics
3	Tutorial	Cardiovascular system	
		Respiratory system	
1	Lecture	Antitussives and antihistamines	Clinical Pharmacology
1	Lecture	Drugs used in asthma	Clinical Pharmacology
1	BST/ Demonstration	Drug delivery in asthma	Clinical Pharmacology
		Disorders of respiratory system:	
2	Lecture	Asthma and chronic obstructive pulmonary diseases	Medicine & Therapeutics
2	Lecture	Tuberculosis	Medicine & Therapeutics
1	Lecture	Pneumonia and lung abscess	Medicine & Therapeutics
1	Tutorial	Respiratory system	
In-course assessment 1 (02 hours)			
General principles of pharmacology, Antimicrobials, Autonomic nervous system, Renal system, Cardiovascular system, Respiratory system			

Term 9			
		Alimentary system	
1	Lecture	Drugs used in peptic ulcer disease	Clinical Pharmacology
1	Lecture	Antiemetics and laxatives	Clinical Pharmacology
1	Lecture	Antidiarrhoeals and probiotics	
1	Lecture	Drugs used in inflammatory bowel disease	Clinical Pharmacology
		Disorders of alimentary system:	
1	Lecture	Peptic ulcer & complications	Medicine & Therapeutics
2	Lecture	Typhoid fever, cholera, leptospirosis, brucellosis	Medicine & Therapeutics
1	Lecture	Amoebiasis	Medicine & Therapeutics
2	Tutorials	Gastrointestinal system	
1	SGD	Prescribing in hepatic impairment	
		Musculoskeletal system	
2	Lecture	Non-steroidal anti-Inflammatory drugs	Clinical Pharmacology
1	Lecture	Drugs used in rheumatoid arthritis and gout	Clinical Pharmacology
2	Lecture	Rheumatoid arthritis and gout	Medicine & Therapeutics
1	Tutorial	Musculoskeletal system	

Term 10			
		Endocrine system	
1	Lecture	Hypothalamic & pituitary hormones	Clinical Pharmacology
1	Lecture	Thyroid and & antithyroid drugs	Clinical Pharmacology
1	Lecture	Corticosteroids & related drugs	Clinical Pharmacology
1	Lecture	Gonadal hormones & related drugs	Clinical Pharmacology
1	Lecture	Hormonal contraceptives and hormone replacement therapy	Clinical Pharmacology
1	Lecture	Tocolytics and other drugs used in labour	Clinical Pharmacology
1	Lecture	Insulin	Clinical Pharmacology
1	Lecture	Oral and other hypoglycaemic agents	Clinical Pharmacology
1	BST/ Demonstration	Insulin therapy	Clinical Pharmacology
1	Lecture	Drugs affecting calcium & bone metabolism	Clinical Pharmacology
		Disorders of endocrine system:	
2	Lecture	Diabetes Mellitus	Medicine & Therapeutics
2	Lecture	Thyroid dysfunctions: Hypothyroidism & hyperthyroidism	Medicine & Therapeutics

3	Tutorial	Endocrine system	
1	SGD	Prescribing in pregnancy	
		Toxicology	
1	Lecture	Heavy metal poisoning and chelating agents	Clinical Pharmacology
1	Lecture	Management of poisoning	Medicine & Therapeutics

		Term 11	
		Central Nervous System	
1	Lecture	General anaesthesia and anaesthetic premedication	Clinical Pharmacology
1	Lecture	Local anaesthesia	Clinical Pharmacology
1	Lecture	Skeletal muscle relaxants	Clinical Pharmacology
2	Lecture	Opioids and antagonists	Clinical Pharmacology
2	Lecture	Anticonvulsants	Clinical Pharmacology
1	Lecture	Drugs used in neurodegenerative diseases	Clinical Pharmacology
1	Lecture	Drugs used in migraine	Clinical Pharmacology
		Psychotropic drugs:	
1	Lecture	Hypnotics, sedative and anxiolytics	Clinical Pharmacology
1	Lecture	Antipsychotics and mood stabilisers	Clinical Pharmacology
1	Lecture	Antidepressants	Clinical Pharmacology
1	Lecture	Substance abuse	Clinical Pharmacology
		Disorders of central nervous system:	
1	Lecture	Chronic head ache and migraine	Medicine & Therapeutics
2	Lecture	Epilepsy	Medicine & Therapeutics
1	Lecture	Parkinson's disease	Medicine & Therapeutics
1	Lecture	Myasthenia gravis	Medicine & Therapeutics
2	Lecture	Meningitis, cerebral abscess and encephalitis	Medicine & Therapeutics
3	Tutorial	Central nervous system	
		Miscellaneous	
1	Lecture	Haemopoietic agents	Clinical Pharmacology
1	Lecture	Vitamins and minerals	Clinical Pharmacology
1	Lecture	Topical preparations	Clinical Pharmacology
2	Lecture	Anticancer drugs	Clinical Pharmacology
In-course Assessment 2 (02 hours) Alimentary system, musculoskeletal system, endocrine system, toxicology, central nervous system and miscellaneous topics			

5.14.3. Summary

		Term 5	Term 6	Term 7	Term 8	Term 9	Term 10	Term 11	Total
Lecture	Clinical pharmacology	15	14	12	11	07	10	18	87
	Medicine &Therapeutics			01	13	06	05	07	31
Bed side teaching / Demonstration		01	02		01		01		05
Small group discussions		02		01		01	01		05
Tutorial		02		02	04	03	03	03	18
In-course assessment					02			02	04
Total		20	16	16	31	17	20	30	150

5.14.4. Evaluation

	Type of Assessment	Distribution of Marks- First examination	Distribution of Marks- subsequent examinations	Details of Evaluation	Qualifying marks (%)
	Continuous assessments	**20**	-		
1.1	In-course assessment	10	-	2 in-course assessments	
1.2	Study guide*	10	-		
	End of the course assessments	**80**	**100**		
2.1.	Single best	12.5	17.5	30 questions, 1 hour	45%
	MCQ	12.5	17.5	20 questions, 1 hour	
2.2.	Essay	25	35	4 questions – Pharmacology, 2 questions- Therapeutics, 3 hours	
2.3.	OSCE	20	20	10 stations (4min per station)	
2.4.	Viva	10	10	10 min per student	

***** *Students fail to submit the study guide on or before the deadline will* ***not be allowed*** *to sit for the end of course examination in Clinical Pharmacology and Therapeutics.*

5.14.5. References:

Text books:

1. Clinical Pharmacology. Peter N Bennett, Morris J Brown and Prakaj Sharma. 12th edition, Edinburgh: Churchill Livingstone, 2018.
2. Basic and Clinical Pharmacology by B.G.Katzung, Susan Masters and Anthony Trevor, 13th edition, London: Churchil Livingstone, 2015.
3. Rang and Dale's Pharmacology. 9thedition, London: Churchill Livingston, 2019.
4. Clinical Medicine. Parveen Kumar and Michael Clark, 8th edition, Edinburgh: Elsevier, 2011.
5. Davidson's principles & practice of medicine. 23nd edition, Edinburgh: Churchill Livingstone, 2018.
6. Foundations of Pharmacology for students of Medicine and Allied Health Sciences. R. L. Jeyakody, 2009.
7. British National Formulary latest issue, British Medical Association, UK.

Reference books:

1. Goodman & Gillman's the pharmacological basis for therapeutics. Laurence Brunton., John Lazo., and Keith Parker, 13th edition, New York: McGraw Hill, 2018.
2. Graham Smith, D. G. and Aroson, J. K. Oxford Text Book of Clinical Pharmacology and Drug Therapy, Oxford University Press, 3rd edition, Oxford, 2002.
3. The Sri Lankan Prescriber, University of Colombo and the Ministry of Health, Sri Lanka, Colombo (Quarterly Publication).
4. Drugs and therapeutics Bulletin (DTB), Consumer Association (UK).

5.15. Medicine

[Person in Charge- Head Medicine]

5.15.1. Description

Aim of the undergraduate clinical medicine training programme is to provide the required knowledge, skills and attitudes to practice as a doctor in the community. He or she should be able to cure illnesses, relief suffering, and comfort patients under his or her care and to refer difficult patients for specialized treatment.

The medicine training programme involves delivery of knowledge, imparting skills and attitudes through a variety of educational tools including integrated lectures, student centred seminars and symposia, clinical lecture demonstrations, clerking of patients and bed side teaching/discussions.

General Objectives

At the end of this comprehensive medicine training programme, the trainee should be able to fulfil the missions and vision of the training programme

- Exhibit excellence in clinical skills (History taking, clinical examination, arrive at a diagnosis/differential diagnosis, decision making and management)
- Embody respect for the ideals of equity, diversity and cultural sensitivity
- Embody high standards of professional conduct
- Embrace life-long learning.

5.15.2. Intended learning outcomes

- Exhibit excellence in history taking
- Perform a complete physical examination systematically with correct technique
- Elicit the physical signs and interpret them to construct a differential diagnosis/diagnosis
- Perform relevant investigations and interpret the results
- Perform basic therapeutic and diagnostic medical procedures
- Prescribe necessary treatment and manage patients or refer for specialized care.
- Recognize the medical emergencies, manage and refer them appropriately.
- Provide necessary advice to the patients and follow them up.
- Notify the relevant diseases and play a key role in preventing diseases.
- Adhere to medico legal ethics in the day to day practice and assist the legal system in the administration of justice
- Communicate effectively with patients, family members, peers and others stakeholders

5.15.2. Intended Learning Outcomes

Name of the specific Subject	Rheumatology and Rehabilitation
Aim	• Pathophysiology, epidemiology, natural history, clinical presentation, evaluation and management of common rheumatological diseases • How to approach a patient with rheumatological disease • Diverse presentation of rheumatological disease
Intended Learning Outcomes	• Explain the aetiology, pathophysiology, clinical presentation, evaluation and management of common rheumatological diseases such as Systemic Lupus Erythematosus and other Connective Tissue Disorders, Rheumatoid Arthritis, Seronegative Spondyloarthropathies, Crystal induced arthritis, Osteoarthritis, Osteoporosis and bone and joint infections. • Evaluate a patient with musculoskeletal symptoms • Evaluate a patient with low back pain • Apply the pathophysiology, aetiology, clinical presentation, complications, evaluation and management of different types of vasculitides • Demonstrate the skills necessary to perform the procedures related to rheumatological diseases eg: joint aspiration • Apply the basic principles of rehabilitation • Distinguish the different approaches and disciplines involved in rehabilitation.

Name of the specific Subject	Haematology, Oncology, and Transfusion medicine
Aim	• Common haematological diseases in adults • Common Oncological diseases • Common indications of transfusions of blood products and transfusion related complications
Intended Learning Outcomes	• Explain the pathophysiology, aetiology, clinical presentation, evaluation and construct a management plan of common haematological problems such as different types of anaemia, isolated thrombocytopenia and pancytopenia • Differentiate the causes of abdominal masses and lymphadenopathy in different haematogical diseases • Evaluate a patient with abnormal haematological investigation with the clinical context • Distinguish different haematological diseases with venous and arterial thrombosis

	• Demonstrate the knowledge on indications, monitoring and complications of anticoagulant therapy • Apply the knowledge on inheritance, pathophysiology, investigations and management plan of inherited and acquired bleeding disorders • Identify the different indications, complications of of transfusion of blood and blood products • Demonstrate setting up a blood or blood product transfusion with safe transfusion procedures • Outline the evaluation of suspected haematological malignancies • Apply the concept of management of haematological malignancies and treatment related complications • Apply the basic concepts of palliative care in haematological malignancies

Name of the specific Subject	**Infectious disease and immunology**
Aim	• Epidemiology, pathogenesis, natural history, clinical features, prevention & control, and management of human illness caused by any infectious agent such as bacteria, mycobacteria, fungi, viruses, parasites, and prions • Apply the knowledge of microbiology, clinical laboratory testing and antimicrobials on clinical practice • Concepts of innate and adaptive immunity and vaccination
Intended Learning Outcomes	• Explain aetiology, epidemiology, pathogenesis, natural history, clinical features, prevention, and management of commonly seen community-acquired infections in Sri Lanka, including dengue fever, Tuberculosis, Leptospirosis, pneumonia, gastroenteritis, hepatitis, infections of the genital and urinary tract, endovascular, central nervous system, skin and soft tissue, head and neck, bone and joint, device associated infections and health care associated infection • Demonstrate knowledge on Infectious diseases in special hosts or specific populations such as: Travelers, Immune compromised hosts, including those with primary or secondary immune deficiency, Pregnant women ,HIV infected individuals • Develop a differential diagnosis for fever syndromes, including fever of unknown origin • Discover the presence of sepsis, systemic inflammatory response syndrome and multiple organ dysfunction/failure syndrome, and describe the principles of their management • Demonstrate proper specimen selection, collection, and transportation for diagnosis of infectious diseases • Apply the concepts of innate and adaptive immunity and vaccination

	• Demonstrate knowledge of the pathogenic mechanisms by which immune responses facilitate or prevent disease, including cytokines, graft versus host diseases, and transplant rejection • Develop an approach to the immunological evaluation of the patient with recurrent infections • Demonstrate knowledge on Identification and management of allergic reactions and anaphylaxis.

Name of the specific Subject	**Renal Medicine**
Aim	• Clinical features, aetiology, pathogenesis, management and prognosis of common renal syndromes including nephrotic, nephritis, rapidly progressive GN, acute kidney injury and chronic renal failure. • Diseases related to renal tubules and interstitium • Evaluation of nephrolithiasis and inherited renal diseases.
Intended Learning Outcomes	• Develop an approach on assessment, evaluation and management of Hematuria and proteinuria and underlying renal syndromes • Demonstrate knowledge on etiology, pathophysiology, clinical features, differential diagnosis, management (including preventive measures and complications of diseases & treatment) and prognosis of the following common conditions: - acute kidney injury - chronic kidney disease - proteinuria - hematuria - nephrolithiasis - secondary hypertension - inherited renal disorders (cystic, metabolic, tubular) - dysuria/pyuria • Apply the knowledge on clinical features, pathophysiology, natural history, and management of primary renal disease and renal disease associated with systemic disorders. • Explain the basic concepts of Renal replacement therapy including peritoneal dialysis, hemodialysis and renal transplantation • Explain the role of renal biopsy including its indications and risks in both native and transplanted kidneys. • Demonstrate knowledge of renal diseases in special population such as renal disorders of pregnancy • Apply the risk assessment and management of contrast-induced nephropathy. • Demonstrate prescribing medicines in renal diseases

Name of the specific Subject	**Fluids, Electrolytes and Acid-based disorders**
Aim	• Clinical features, evaluation, etiology, diagnosis and management of fluid, electrolyte and acid-base disorders
Intended Learning Outcomes	• Explain handling of the following molecules at each segment of the nephron under normal conditions, and during hyper- and hypovolemia o Sodium, Potassium, chloride, water, bicarbonate, protein and ammonia • Analyse knowledge on causes, clinical features, evaluation and management of common electrolytes (Na, K, Ca, phosphate, Bicarbonate etc.) related disorders • Distinguish water homeostasis and describe common conditions associated with abnormalities of water and sodium, including: volume overload dehydration hypo- and hypernatraemia syndrome of inappropriate antidiuretic hormone (SIADH) diabetes insipidus • Explain the physiology of oedema formation, clinical assessment, causes, differential diagnoses and management of both localized and generalized edema. • Apply the physiology of acid/base homeostasis in health, metabolic acidosis and alkalosis, and respiratory acidosis and alkalosis. • Demonstrate a diagnostic approach and management of simple acid/base disorders which include: Wide anion gap metabolic acidosis Normal anion gap metabolic acidosis Renal tubular acidosis Chloride responsive & resistant metabolic alkalosis Respiratory acidosis and alkalosis Mixed acid-base disturbances

Name of the specific Subject	**Clinical Toxicology and Toxinology**
Aim	• General principles of toxicology including toxidromes and clinical application • Envenoming including snake bite and its management

Intended Learning Outcomes	• Demonstrate and apply an understanding of the history, assessment, and therapy considerations associated with the management of a toxic exposure
	• Develop knowledge and skills in the following
	  o Resuscitation and stabilization
	  o Risk assessment
	  o Decontamination and enhanced elimination
	  o Antidotes
	  o Reassessment and observation
	• Develop knowledge and skills in the following common poisoning states
	  Chemicals and metals (Organophosphate)
	  Pharmaceuticals (Paracetamol, anti-epileptics, anti-diabetics)
	  Toxic alcohols (Ethanol, methanol, ethylene glycol)
	  Common Plants poisoning (Oleander, Datura etc)
	• Demonstrate effective communication and collaboration with colleagues in toxicology and poison information centre.
	• Illustrate identification, clinical features, evaluation, management and complications of venomous snake bites in Sri Lanka
	• Develop knowledge on clinical features, evaluation and management of other common animal bites in Sri Lanka such as jelly stings, bee stings etc
	• Demonstrate knowledge on mental health assessment of a patient with deliberated self-poisoning
	• Apply legal, regulatory, and ethical considerations relating to toxicology within the broader societal context.

Name of the specific Subject	**Adult critical care medicine**
Aim	• Students to learn basic principles in the recognition of serious illness and its clinical management. • Awareness of the ethical principles pertinent to critically ill patients, including end-of-life care and issues around withdrawing and withholding life support
Intended Learning Outcomes	• Demonstrate knowledge and understanding of the relevant anatomical, biochemical, physiological and pathological processes commonly encountered in critical care • Interpret common acute investigations such as ECG, ABG etc.

	• Interpret common diagnostic tests and imaging in the critical care environment • Identify and know how to manage common and important acute clinical conditions • Demonstrate understanding of the principles of resuscitation • Demonstrate knowledge in the safe application of equipment, careful monitoring, judicious use of drugs, and the coordinated provision of multidisciplinary care for effective organ system support • Develop knowledge on recognition of various types of shock and their causes and management • Demonstrate knowledge on recognition of respiratory failure and their management including basic understanding on non-invasive and invasive ventilation • Explain the indications, contraindications, and complications of central catheters • Demonstrate knowledge on organ failure and basic supportive care • Explain the end of life care

Name of the specific Subject	**Emergency Medicine**
Aim	• Systemic approach to the assessment and treatment of the acutely ill patient • Clinical and technical skills and decision-making capabilities pertinent to the management of various emergency conditions
Intended Learning Outcomes	• Explain, recognize and discuss treatment of common signs and symptoms that present emergently such as fever, difficulty in breathing, abdominal pain, limping, rash, depression and headache. • Demonstrate knowledge, skills and attitudes required to assess and manage common adult emergencies listed below Acute coronary syndromes Allergic reaction and anaphylaxis Cardiac arrhythmias Diabetic ketosis Exacerbation of COAD, asthma Heart failure Pancreatitis Pulmonary embolus Subarachnoid haemorrhage Acute Stroke Haematemesis Haemoptysis Angioedema Upper airway obstruction Toxicology and Environmental Emergencies Shock including dengue shock syndrome Delirium Alcohol withdrawal Acute hepatic failure Metabolic encephalopathy

Name of the specific subject	Respiratory system
Aim	• Infections of upper airway and lung parenchyma • Small airway diseases: bronchial asthma and chronic obstructive airway disease. • Upper airway disease: Obstructive sleep apnea. • Diffuse parenchymal lung disease of known and idiopathic causes. • Primary lung malignancies, pleural malignancies and lung secondaries. • Disease of pleura and pleural spaces: pneumothorax and pleural effusion. • Lung involvement in systemic illnesses: vasculitis. • Basic lung functions
Intended learning outcome	• Relate to basic pathology, pathophysiology and microbiology of relevant respiratory disease conditions. • Relate to pharmacology and community aspects of managing diseases. • Evaluate a patient with respiratory symptom to arrive at a clinical diagnosis in conjunction with physical signs. • Demonstrate knowledge on aetiology, risk factors, pathophysiology and clinical presentations of common respiratory diseases. • Demonstrate & plan investigations based on clinical findings. • Demonstrate nonpharmacological and pharmacological management of common respiratory diseases. • Recognize and manage respiratory emergencies. • Demonstrate practical skills on doing PEFR, ABG, Inhaler techniques and ambu bag ventilation of patients • Develop basic skills in reading chest x-ray and ABG

Name of the specific subject	Endocrine disease
Aim	• Diabetes mellitus and spontaneous hypoglycemia • Hyper and hypothyroid disorders • Hyper and hypoadrenalism. • Hyper and hypoparathyroidism • Hypothalamus, Hyper and hypopituitarism. • Disorders of the Reproductive system. • Gastrointestinal neuro-endocrine tumors • Osteoporosis and obesity • Poly glandular endocrine deficiency syndrome. • Multiple endocrine tumors
Intended learning outcomes	• Relate physiology, anatomy and biochemistry of endocrine glands • Demonstrate basic pathophysiology of common endocrine disease • Apply the Clinical features of common endocrine diseases • Explain the basic plan of investigating relevant common endocrine diseases • Demonstrate Knowledge on interpreting investigation findings • Apply basic plan on treatment and follow up of patients. • Plan and Educate the patients about the relevant diseases

Name of the specific Subject	Cardiovascular Diseases
Aim	• Pathophysiology, epidemiology, natural history, clinical presentation of common cardiovascular diseases • Evaluation of a patient with a cardiovascular disease including history taking physical examination and investigation. • the management principles of cardiovascular diseases
Intended Learning Outcomes	• Explain the aetiology, pathophysiology and various clinical presentation, of common categories of cardiovascular diseases including coronary heart disease, valvular heart disease, congenital heart diseases, systemic hypertension, pulmonary hypertension, cardiac arrhythmias including atrial and ventricular, heart failure including cor pulmonale, diseases of myocardium and pericardium, and infective endocarditis. • Demonstrate how to evaluate a patient with a cardiovascular symptom in particular chest pain, shortness of breath, palpitations and syncope. • Demonstrate performing a cardiovascular examination including pulse, blood pressure, Jugular Venous Pulse, precodial examination ie inspection, palpation and auscultation, and to perform necessary cardiac maneuvers/procedures • Interpret the physical signs to construct a clinical diagnosis of a cardiac condition • Apply the basic principles used in investigating a cardiovascular disease including 12 lead ECG, Stress test (Exercise ECG), 2DEchocardiogram, stress echocardiogram, 24-hour holter monitoring, 24-hour ambulatory blood pressure monitoring, non-invasive coronary angiogram, traditional coronary angiogram etc. • Apply the risk factors of cardiovascular diseases and able to screen for it and risk stratify patients based on recommended scoring systems, and to know the indications for anticoagulation and its modalities • Explain the basic principles of cardiac electrophysiological studies and cardiac imaging. • Plan management principles for the common cardiac conditions in particular coronary heart disease, hypertension, valvular heart diseases and heart failure and to know about indications for interventions such as cardiac pacing, insertion of devices and relevant surgical options • Apply the principles of cardiac rehabilitation

Name of the specific Subject	**Gastroenterology**
Aim	• Pathophysiology, epidemiology, natural history, etiology and clinical presentation of common GI diseases • Evaluation of a patient with GI disease • Basic principles of management of GI disorders
Intended Learning Outcomes	• Explain the aetiology, pathophysiology, clinical presentation of common GI diseases - Peptic ulcer disease - GI infection - Malabsorption syndrome - Inflammatory bowel diseases - Common GI emergencies - Common GI malignancies • Evaluate and manage a patient with GI symptoms including GI emergencies. • Demonstrate the preparation for GI scopes and imaging studies. • Explain GI manifestations of systemic diseases.

Name of the specific Subject	**Hepatology**
Aim	• Pathophysiology, epidemiology, natural history, etiology and clinical presentation of common liver disease • Evaluation of a patient with liver disease • Basic principles of management relevant liver diseases
Intended Learning Outcomes	• Explain the aetiology, pathophysiology, clinical presentation of common liver diseases - Hepatitis - Acute liver failure - Liver cirrhosis and complications - Metabolic liver disease - Liver diseases in pregnancy - Liver malignancy • Demonstrate approaching a patient with symptoms of liver disease or abnormal liver biochemistry. • Apply the pathophysiology of primary liver diseases and hepatic manifestation of systemic diseases • Plan and manage patients with liver disease

Name of the specific Subject	**Neurology**
Aim	• Pathophysiology, aetiology, epidemiology, natural history and clinical presentation of common neurological conditions • How to evaluate a patient with neurological disorder. • Understanding the management principles of neurological disorders
Intended Learning Outcomes	• Explain aetiology, pathophysiology and clinical presentation of common neurological disorder - Headache - CNS infection - Inflammatory diseases of nervous system - Stroke - Seizure and epilepsy - Neurodegenerative disorders - Disease of the spinal cord and peripheral nerves - Neuromuscular disorder • Evaluate a patient with neurological symptoms • Demonstrate skills to perform neurological examination and interpretation of clinical findings • Apply management principles of common neurological disorders • Demonstrate skills to perform lumbar puncture • Apply basic principles of rehabilitation and understand the role of different disciplines

5.15.3. Detailed Syllabus

Term 7		
		Nephrology
2	Lecture	Acute Renal Injury
2	Lecture	Glomerular diseases
1	Lecture	Tubulointerstitial Nephritis
1	Lecture	Renal calculi and nephrocalcinosis
1	Lecture	Cystic renal diseases

Term 8		
		Cardiovascular system
1	Lecture	Disorders of myocardium – cardiomyopathy and myocarditis
1	Lecture	Pericardial diseases – Pericarditis, pericardial effusion and constrictive pericarditis
		Respiratory System
1	Lecture	Tumours of the respiratory tract
1	Lecture	Occupational lung disease
1	Lecture	Interstitial lung diseases
		Gastroenterology
1	Lecture	Oesophagus – Dysphagia and GORD
2	Lecture	Diarrhoea and malabsorption
1	Lecture	Liver diseases during pregnancy
1	Lecture	IBD
1	Lecture	Hepatitis

Term 10		
		Neurology
1	Lecture	Cerebrovascular disease
2	Lecture	Movement disorders
1	Lecture	Spinal cord disease
1	Lecture	Peripheral nerve disease
2	Lecture	Neurodegenerative diseases
		Haematology
1	Lecture	Approach to a patient with anaemia
1	Lecture	Myeloproliferative disorders
1	Lecture	Lympho proliferative disorders
1	Lecture	Myeloma and paraprotenamia
1	Lecture	Approach to a patient with bleeding disorder

Clinical Lecture demonstrations

	Topics	**Hours**
1	Haematology • A patient with symptomatic anaemia • Evaluation of a patient with excessive bleeding	2
2	Radiology • Basic interpretation of radiological investigations related to clinical presentation of different cases	1
3	Transfusion • A patient with transfusion related reaction	2
4	Respiratory System • A patient presents with difficulty in breathing	1
5	Genetics • A patient with family history of a medical condition	1
6	Ethics & Communication • Dealing with a difficult situations/aggressive patient/decision making	3
7	Medical Statistics • Interpretation of data provided	1
8	Cardiovascular System • A patient with palpitation/A patient with shortness of breath/A patient with syncope	1
9	Neurology • A patient with forgetfulness/ A patient with altered level of consciousness/ A patient with abnormal involuntary movement/A patient with headache	3
10	Rheumatology and Rehabilitation • A patient with low back pain/ A patient with joint pain and rash	2
11	Endocrinology • A patient with symptoms of thyroid dysfunction	1
12	Oncology • A patient with metastatic carcinoma requiring end of life care	1
13	Geriatrics • A lady with recurrent falls	1
14	Intensive care • A patient with muti-organ dysfunction	1
15	Infection A patient with shock	1
16	Nutrition • A lady with high BMI	1
	Total	25 Hours

5.15.4. Summary

		Term 5	Term 6	Term 7	Term8	Term 9	Term 10	Term 11	Final	Total
Lecture				**10**	**5**	**6**	**5**	**12**	**-**	**38**
Clinical*	Medicin**e**	**144**			**144**				**384**	**672**
	Medical subspec.								**312**	**312**
CLD									**25**	**25**
Total										**1047**

on call hours, casualty nights and weekend duty have not been considered

5.15.5. Evaluation

Method of assessment		Distribution of Marks – First examination	Distribution of Marks – subsequent examinations	Details of evaluation:- Eg: No. of hours of question etc.	Qualifying pass marks (%)
Continuous Assessment		**20***	**-**		
End of course		**80**	**100**		
1	MCQ + SBA	20	25	20 T/F + 30 SBA – 2 Hrs	45% in theory
2	Essay	20	25	10 questions – 3 Hrs	
3	Long case	20	25	1 case	50% in Clinical
4	Short case	20	25	4 cases	
Overall pass marks					**50%**

***Continuous Assessment – 20% (20/100)**

- Pre-professorial assessment – 5 %
- Assessment during and end of professorial appointment
    - Assessment of Log book and viva – 5%
    - OSCE and theory – 10%
      OSCE has several assessment stations including assessment of observed history taking and communication skills

5.15.6. References

1. Clinical Medicine. Parveen Kumar and Michael Clark, 9th edition, Edinburgh Elsevier, July 2016
2. Davidson's Principles & Practice of Medicine. 23 rd edition by: Stuart H, Ralson (et-al), Edinburgh: Churchil Livingstone April 2018
3. Hutchison's Clinical Methods. 23rd edition by Michael Swash. Edinburgh: WB Saunders, November 2017
4. Management of Poisoning. 5th revised edition, by Prof Ravindra Fernando, Sri Lanka Education, training & research unit of ministry of health, nutrition & indigenous medicine. 2018
5. Guidelines published by Health ministry and Colleges in Sri Lanka – 2018/2019 Eg.: Management dengue infection in adults and pregnant mothers

Further reading

6. Oxford Text book of Medicine. Vol I,II & III. 5th Edition by Wheatherall D.J., T.M.Cox and Warrel D.A, Oxford: Oxford University Press, 2017
7. Harrison's Principles of Internal Medicine. 17th edition, by Dennis Kasper…(et-al), New York: Mc Graw Hill, 2008

5.16. Obstetrics and Gynaecology

[Person in Charge- Head Obstetrics and Gynaecology]

Main aim of undergraduate teaching in **Obstetrics and Gynaecology** will be to gain knowledge and practical skills and to be successful in the final MBBS examination. This will be an important milestone in preparing a medical student to be a safe, knowledgeable and reliable houseman and to be an independent practitioner in future.

Learning and teaching would be student centred rather than traditional lectures. Methods such as problem-based learning, skill-based learning with regards to patient care and management with due consideration of ethics and values will be practiced. Specific and mandatory learning objectives of basic clinical skills and procedures related to **Obstetrics and Gynaecology** will also be part of the programme.

During the clinical appointments' students are expected to improve their communication skills, organizational skills, presentation skills, leadership capacity, capacity to work as a team, cope with stress and to work effectively and efficiently.
Utmost importance is given to the students' attitude towards patients, colleagues and support staff.

The detailed learning outcomes of the **Obstetrics and Gynecology** topics are given below and the student is expected to have possess the necessary knowledge, skill and attitude at the final MBBS examination.

The above is achieved through the relevant preclinical teaching, through two clinical appointments four weeks each with the Ministry of Health led units at Teaching Hospital – Jaffna and the Professorial clinical appointment during the final year.

5.16.1. Intended Learning Outcome

Topic 01	**Basic clinical skills**
Aim	To demonstrate and utilize appropriate knowledge, skills and attitudes in relation to history taking, examination, investigation, procedural skills and communication in obstetrics and gynaecology.
Intended Learning Outcomes	• Demonstrate history taking and examination • Apply information gained in clinical anatomy and physiology • principles of genetic modes of inheritance of disease • Explain common structural abnormalities of fetuses resulting from abnormal development • Explain physiological and anatomical changes of normal pregnancy and their clinical relevance • Distinguish pathophysiology of symptoms and signs of disorders related to the female reproductive tract • Perform clinical examination and arrive at a differential diagnosis • Perform a general, obstetric and gynecological examination (including speculum and bimanual) • Identify an acutely unwell obstetric or gynecological patient • Develop o empathy, respect, confidentiality and privacy when communicating with clients and their families o using of non-technical language when communicating relevant details to the patient and the family o respect towards patients when examining by ensuring the presence of a chaperone o value of input from other professionals in where appropriate o ability to recognize one's limitations

Topic 02	**Basic procedures**
Aim	To demonstrate and utilize appropriate knowledge and skills in performing procedures in obstetrics and gynaecology
Intended Learning Outcomes	• Explain basic principles of surgical procedures including indications, contraindications, procedure, possible complications and aftercare • Illustrate basic steps of commonly performed procedures in obstetrics and gynaecology • Choose instruments used in commonly performed procedures in obstetrics and gynaecology • Distinguish postoperative monitoring and pain management • Apply the principles of post-operative fluid management • Demonstrate preparing a patient for minor or major surgery • Demonstrate obtaining consent for common procedures • Relate to complications of procedures and how they can be identified • Demonstrate communication skills on discharge from hospital, including advice on when to seek medical advice urgently ('safety netting') and follow up in the field and hospital • Plan and manage common complications of obstetric and gynaecological surgery • Demonstrate the following procedures: o maintain a MEOWS chart o cervical smear test o endometrial biopsy o obtain swabs for microbiological investigations o manage postoperative pain o maintain appropriate clinical notes • Demonstrate: o use of principles of obtaining consent for surgery o the ability to communicate the agreed management plan to healthcare team, patient and family o adherence to clinical guidelines and protocols o maintaining confidentiality when divulging information o the ability to recognize specific situations in which patient confidentiality is breached (e.g. Notifiable diseases)

Topic 03	**Ethical and Legal issues**
Aim	To demonstrate and utilize appropriate knowledge, skills and attitudes in relation to ethical and legal issues as they apply to obstetrics and gynaecology
Intended Learning Outcomes	• Explain importance of consent and consenting process in the care of minors (Fraser/Gillick competence) • Apply ethical principles of safeguarding minors from an abusive environment • Demonstrate and practice patient confidentiality, data protection and legal aspects of consent • Apply concepts of child protection • Adapt the rights of clients and family members • Adapt legal status of termination of pregnancy • Value clinical data according to ethical principles • Demonstrate obtaining verbal and written consent • Assess capacity for consenting of a minor using Fraser/Gillick competency • Develop: o ability to recognize the level of comprehension of clients and relatives and provide information in an appropriate manner o ability to appraise the client's needs on an individual basis o principles of confidentiality o ability to respond to the requirements of children and adolescents

Topic 04	**Preconception care**
Aim	To demonstrate and utilize appropriate knowledge, skills and attitudes in relation to preconception care to reduce complications during pregnancy
Intended Learning Outcomes	• Explain principles of preconception care • List interventions carried out at the Field level in Sri Lanka for preconception care • Explain effects of common non-communicable diseases affecting pregnancy and relevant screening tests • Distinguish the place of contraception in preconception care • Assess risks in a couple preparing for pregnancy • Illustrate and draw a pedigree tree • Demonstrate to provide advice on lifestyle modifications and preconception folic acid

	• Plan and make referrals to other specialties where necessary
	• Predict appropriate contraception considering client's social situation and medical conditions
	• Demonstrate preconception counselling
	• Recommend couples with common genetic derangements or a previous child with a genetic disorder
	• Develop
	  o professionalism when providing preconception care
	  o respect towards autonomy of patients

Topic 05	**Antenatal care**
Aim	To demonstrate and utilize appropriate knowledge, skills and attitudes in relation to antenatal care in the low-risk pregnancy, recognition of the high-risk pregnancy and the appropriate modifications to antenatal care.

Intended Learning Outcomes	• Explain Model of antenatal care delivery in Sri Lanka
	• Apply principles of conducting a booking visit
	• Select basic investigations conducted during pregnancy
	• Apply principles of safe prescribing in pregnancy including how pregnancy affects pharmacodynamics and pharmacokinetics
	• List methods of screening for genetic and structural anomalies of the foetus
	• Explain the use of the last menstrual period and ultrasound dating to establish the expected date of delivery
	• Explain the role of ultrasound scanning in the assessment of foetal wellbeing
	• Demonstrate skills to:
	  o calculate the expected date of delivery (EDD)
	  o obtain and present an obstetric history
	  o conduct a general, system and obstetric examination and present the findings
	  o review and interpret investigation results
	  o assess risk factors in a pregnant woman and to classify as low risk and high-risk pregnancies accordingly
	• Develop:
	  o ability to communicate/work in collaboration with staff in different settings
	  o ability to appreciate the roles different categories of staff play in delivery of antenatal care
	  o ability to work in a team

Topic 06	**Low Risk Pregnancies**
Aim	To understand the principles of shared care in low risk pregnancies
Intended Learning Outcomes	• Apply Principles of shared care in low risk pregnancies • Explain the role of Field Staff and clinics in antenatal care • Plan and demonstrate o conduct review visits o calculate the period of gestation o obtain relevant details from the patient o measure blood pressure in a pregnant woman o measure SFH (symphysio fundal height) and chart in a centile chart o determine presentation of fetus o auscultate fetal heart o perform urine analysis and interpret results • Develop o Respect patient autonomy and involvement of woman in decision-making.

Topic 07	**High Risk Pregnancies**
Aim	To demonstrate and utilize appropriate knowledge, skills and attitudes in relation to recognition of the high-risk pregnancy and the appropriate modifications to antenatal care.
Intended Learning Outcomes	• Explain principles of screening, diagnosing and management of high risk pregnancies including o multiple pregnancy o breech presentation o Rhesus alloimmunization o small for dates fetus o large for dates fetus o infections in pregnancy o antepartum haemorrhage o preterm labor o premature rupture of membranes o thromboembolic disorder o post-dates pregnancy o post term pregnancy • Explain the risk factors and causes for: o maternal mortality and morbidity o intrauterine fetal demise (Stillbirths) • Explain the pathophysiology, risk factors and their common complications and managing medical disorders complicating pregnancy: o diabetes mellitus

	○ hypertensive disorders in pregnancy including eclampsia ○ pre-existing hypertension ○ HIV and pregnancy ○ Thrombophilia ○ Epilepsy ○ cardiac disease ○ renal disorders ○ mental health disorders • Evaluate: the effects on pregnancy, basic management and the risks of pre-existing medical conditions on the woman and fetus • Evaluate the risks and modifications required to continuing drug treatment during pregnancy • Evaluate methods available for assessment of fetal wellbeing and their limitations • Evaluate the principles of detecting fetal abnormalities and the use of ultrasound scanning during pregnancy • Demonstrate skills to ○ recognize high risk pregnancies ○ provide antenatal care according to risk situation ○ request and interpret additional investigations for management of patient with high risk pregnancies ○ demonstrate ability to make referrals where necessary ○ participate at a multidisciplinary consultation/clinic ○ break bad news • Develop: ○ effective communication using SBAR as a tool for communication with patient, family members, colleagues and other health care providers. ○ an understanding of impact of social problems on pregnancy especially when complicated. ○ An understanding of impact of pregnancy on daily living ○ The skills on multidisciplinary clinics/meetings in managing pregnancy complications ○ needs and adjustments in management of special groups of women e.g. women who refuse blood or blood products, women carrying socially stigmatized pregnancies ○ empathy towards the patient and other team members in a healthcare team

Topic 08	**Management of Labour**
Aim	To demonstrate and utilize appropriate knowledge, skills and attitudes in relation to management of labour
Intended Learning Outcomes	• Explain anatomy of the fetal skull and female pelvis • Apply mechanism and physiology of normal labour • Apply principles of care during labour • Apply principles of induction and augmentation of labour • List the methods of analgesia in labour • Explain the principles of assessment of fetal wellbeing during labour • Illustrate principles of partography • Compare operative vaginal delivery and caesarean delivery • Illustrate the surgical anatomy of perineum • Perceive obstetric trauma • Demonstrate the following skills o diagnose normal and abnormal labour o provide appropriate pain relief to a woman in labour o maintain a partogram o interpret cardiotocograph tracings o perform a vaginal examination during labour o perform an amniotomy o set up an oxytocin infusion according to protocol o assist/conduct normal vaginal delivery o prepare a patient for and assist in instrumental vaginal delivery o prepare a woman for and assist in a caesarean delivery o provide active management of third stage o recognize women in distress o perform and repair an episiotomy o identify obstetric anal sphincter injury o maintain accurate clinical records • Develop: o effective communication regarding the process of labour o respectful labour care and a positive childbirth experience o empathy towards women in labour o respect towards a woman's autonomy and choice o the awareness of one's limitations and seeking of assistance when necessary

Topic 09	**Obstetric emergencies**
Aim	To demonstrate knowledge, skills and attitudes in relation to early recognition and management of obstetric emergencies and to understand their contribution to maternal mortality
Intended Learning Outcomes	• Explain physiological changes in pregnancy and their impact on complications • Elaborate risk factors, aetiology, pathophysiology, management and preventive measures of obstetric complications such as; o eclampsia o cord prolapse o antepartum haemorrhage o shoulder dystocia o retained placenta o postpartum haemorrhage o acute inversion of the uterus o maternal sepsis o fetal distress • Apply the principles of management and complications of complex vaginal deliveries e.g. twins, breech • Distinguish the causes, consequences, identification, clinical features and management of birth asphyxia • List the causes and management of maternal collapse • Demonstrate and carry out initial management of obstetric emergencies such as: o eclampsia o cord prolapse o antepartum haemorrhage o shoulder dystocia o retained placenta o postpartum haemorrhage o acute inversion of the uterus o maternal sepsis o fetal distress o shock o birth asphyxia o maternal collapse • Develop o effective communication during obstetric emergencies (eg: SBAR) o leadership and teamwork when dealing with obstetric emergencies o effective communication with patients and family when dealing with emergencies

Topic 10	**Management of the postpartum period**
Aim	To demonstrate knowledge, skills and attitudes in providing postpartum care
Intended Learning Outcomes	• Explain the principles of management of normal puerperium and common abnormalities during the puerperium • Identify risk factors, aetiology, pathophysiology and management principles of complications during the postpartum period such as; o puerperal sepsis o postpartum collapse o psychiatric disorders o breastfeeding issues • Identify maternal early warning chart and its application during the puerperium • Distinguish contraceptive choices for postpartum women • Demonstrate ability to o recognize normal and abnormal changes of puerperium o recognize and manage a woman with puerperal sepsis o maintain a MEOWS chart o counsel a postpartum woman regarding contraceptive choices o advise women on the correct technique of breastfeeding and manage problems of feeding • **Develop** o awareness of the need for multidisciplinary management during the postpartum period o empathy towards women with problems during the puerperium

Topic 11	**Gynecological problems**
Aim	To demonstrate appropriate knowledge and attitudes regarding common gynaecological problems
Intended Learning Outcomes	• Explain the principles behind o the menstrual cycle o menarche o menstrual abnormalities o menopause • Identify causes, clinical features, aetiology, pathophysiology and principles of management of; o abnormal uterine bleeding o post coital bleeding o dysmenorrhea (primary and secondary) o chronic pelvic pain

	○ problems of the climacteric (perimenopausal bleeding, symptoms, osteoporosis and hormone replacement therapy ○ primary and secondary amenorrhoea ○ vaginal discharge ○ pruritus vulvae ○ pelvic infections ○ pain in the vulva including Bartholin abscess ○ uterovaginal prolapse ○ urinary incontinence (stress incontinence, urge incontinence and mixed incontinence) • Demonstrate the skills to ○ take a gynaecological history ○ perform a gynaecological examination including a speculum examination ○ counsel and obtain consent for common gynaecological procedures which include; ▪ hysterosalpingogram ▪ evacuation of retained products ▪ diagnostic and operative laparoscopy ▪ hysteroscopy ▪ endometrial sampling ▪ total abdominal hysterectomy with and without conservation of ovaries ▪ vaginal hysterectomy ▪ continence surgery • **Develop** ○ the importance of appropriate referral ○ effective communication with patients and their families about gynaecological conditions ○ the awareness of importance of counselling the patients regarding various gynaecological interventions

Topic 12	**Infertility**
Aim	To demonstrate and utilize appropriate knowledge, skills and attitudes in relation management of a sub fertile couple
Intended Learning Outcomes	• Explain primary and secondary subfertility and their causes which include; ○ ovulatory dysfunction ○ tubal factor ○ endometriosis ○ coital dysfunction

	○ male factor ○ unexplained infertility • Apply principles of investigations in subfertility which include; ○ semen analysis ○ endocrine evaluations ○ tubal patency tests ○ ultrasound in infertility ○ diagnostic laparoscopy and hysteroscopy • Explain the principles of methods of treatment used in subfertility and their complications which include; ○ ovulation induction ○ artificial reproductive techniques ○ gamete donation ○ surgical treatment of infertility (fibroids / endometriosis) • Demonstrate the skill to ○ obtain a history and perform clinical examination in a subfertile couple ○ interpret the results of the investigations which include; ○ hormone profile ○ seminal fluid analysis ○ hysterosalpingogram ○ counsel a couple on the basic management plan • Develop: ○ the appreciation of the psychological, emotional and social impacts of infertility ○ the awareness of the issues surrounding gamete donation, adoption and surrogacy ○ rational use of available treatment options in subfertility

Topic 13	**Contraception**
Aim	To demonstrate and utilize appropriate knowledge, skills and attitudes in relation to fertility control (contraception)
Intended Learning Outcomes	• Explain mechanisms of action, indications, contraindications, their limitations, advantages and complications of; ○ hormonal contraceptive methods ○ permanent contraceptive methods ○ natural contraceptive methods ○ long acting reversible contraceptive methods ○ emergency contraceptive methods • Apply the principles behind obtaining consent for contraception • Identify the issues posed by unplanned pregnancy

	• Demonstrate the skill to
	  o obtain a relevant history from a woman/couple attending a family planning clinic
	  o counsel a woman/couple who attends a family planning clinic
	  o carry out core activities of a family planning clinic
	• Develop
	  o appreciation of the importance of family planning for women's health, safe motherhood and women's empowerment
	  o appreciation of the need to avoid care provider's personal biases in providing contraception

Topic 14	**Sexually transmitted infections (STI)**
Aim	To demonstrate and utilize appropriate knowledge, skills and attitudes in relation to diagnosis and management of sexually transmitted infections (STI), including HIV and sexual dysfunction

Intended Learning Outcomes	• Identify STIs prevalent in Sri Lanka
	• Explain epidemiology of STI in Sri Lanka
	• Distinguish STI transmission and their prevention
	• Identify importance of contact tracing
	• Summarise symptoms and signs of common STIs
	• Plan the management of common STIs
	• Explain the effects of STIs on pregnancy and their management
	• Plan the management of STIs in rape victim
	• Demonstrate the skill to
	  o obtain a relevant history from a woman/couple attending a STI clinic
	  o counsel a woman/couple diagnosed as having a STI
	• Develop recognition of the personal and social implications of the diagnosis of a STI

Topic 15	**Early pregnancy problems**
Aim	To demonstrate and utilize appropriate knowledge, skills and attitudes in relation to early pregnancy loss and other problems of early pregnancy
Intended Learning Outcomes	• Explain causes of bleeding and/or pain in early pregnancy • Identify classification of miscarriage • Explain presentation and management of miscarriage and ectopic pregnancy

	• Assess the use of ultrasound and hormonal assessment in early pregnancy problems • Assess use of anti-D in early pregnancy bleeding • Explain emesis and hyperemesis gravidarum • List the aetiology, characteristics and modes of management of; • Explain o normal symptoms of early pregnancy o miscarriage o ectopic pregnancy o molar pregnancy o the principles behind the use of investigations utilized in early pregnancy problems, which include: o haematological investigations and rhesus status o urine pregnancy test and serum beta-hCG o pelvic ultrasound o laparoscopy • Demonstrate the skill to o obtain a history, perform a clinical examination in a woman with an early pregnancy problem o develop a basic management plan in women who present with an early pregnancy problem o recognize women who require immediate resuscitation and to institute emergency resuscitative measures • Develop to provide empathetic counselling to women and their families • Develop the ability to recognise the importance of personal and social impact of the diagnosis of a miscarriage, ectopic or molar pregnancy

Topic 16	**Gynaecological oncology**
Aim	To demonstrate and utilize appropriate knowledge, skills and attitudes in relation to social and clinical aspects of gynecological cancers
Intended Learning Outcomes	• Explain surgical anatomy of the female genital tract • Summarise epidemiology, aetiology, diagnosis, management and prognosis of common gynaecological cancers • Explain symptoms and signs of common gynaecological cancers • Apply screening for papillomavirus, preclinical phases of invasive cervical carcinoma and management of those with positive results

	• Distinguish short- and long-term complications of surgery, chemotherapy and radiotherapy • Explain endometrial hyperplasia, its aetiology, prognosis and management • List histological classification and staging of cervical, endometrial and ovarian carcinoma • Apply principles of palliative care • Explain principles of breaking bad news to a patient/family • Demonstrate the skill to o counsel a patient with cancer and her family regarding a basic management plan and prognosis o screen for cervical cancer o counsel a woman who has a positive cervical smear test o obtain consent from a woman undergoing surgery for a gynecological malignancy • **Develop** o the awareness of the implications of diagnosis of a gynaecological malignancy on a woman and her family o the awareness of the need for long term follow up of women with gynaecological malignancies

Topic 17	**Urogynaecology and pelvic floor problems**
Aim	To demonstrate and utilize appropriate knowledge, skills and attitudes in relation to social and clinical aspects of urogynaecological problems
Intended Learning Outcomes	• Explain pelvic anatomy in relation to factors that help in maintaining the uterus in its normal position • Illustrate anatomy and physiology of the bladder in relation to the maintenance of urinary continence • List aetiology and pathophysiology of urinary incontinence • Distinguish classification and components of uterovaginal prolapse • Apply the concepts of investigations carried out in women with urinary incontinence including urodynamics • Explain symptoms associated with uterovaginal prolapse • List clinical features of urinary tract infection, urodynamic stress incontinence and detrusor instability • Apply basic concepts of treatment approaches in management of uterovaginal prolapse, urinary incontinence and their untoward effects • Know the basic concepts of Burch colposuspension, pelvic repair with and without hysterectomy and sling procedures

	• Distinguish non-pharmacological and pharmacological therapies in urinary incontinence • Demonstrate the skill to o obtain a relevant history and perform clinical examination in a woman with a urogynaecological problem o recognize the presence and degree of a uterovaginal prolapse o formulate a management plant in a woman with a urogynaecological problem • Develop o appreciation of personal and social implications of urinary incontinence o recognition of the reluctance of women to discuss urogynaecological issues o recognition of major complications that could ensue from treatment for urogynaecological problems

Clinical Lecture Demonstrations

	TOPICS	Time Hrs
01	AN care/Risk Assessment	1
02	Anaemia complicating pregnancy	1
03	HT/Renal disease	1
04	Diabetes complicating pregnanacy	1
05	Hematological disorders	1
06	Screening for Malignancy	1
07	Contraception	1
08	Trophoblastic diseases	1
09	Endometriosis	1
10	Ca Ovary	1
11	Ca Endometrium	1
12	Ca Cervix	1
13	Ca Vulva	1
14	Pelvic inflammatory disease	1
15	Urogynaecology	1
16	Subfertility	1
17	Abnormal uterine bleeding	1
18	Menopause /HRT	1
19	Amenorrhoea	1
20	Recurrent miscarriages	1
21	Prenatal diagnosis	1
22	PROM/Pre Term Labour	1
23	Ethical +Medico legal issues	1
24	Maternal Mortality, Perinatal Mortality	1

5.16.2. Summary

	Term 5	Term 6	Term 7	Term8	Term 9	Term 10	Term 11	Final	Total
Clinical*	**96**			**96**				**384**	**576**
CLD								**24**	**24**
Total									**600**

**on call hours, casualty nights and weekend duty have not been considered*

5.18.3. Evaluation

Type of Examination		Distribution of Marks- First examination	Distribution of Marks- subsequent examinations	Details of evaluation – No. of hrs No. of question etc.	Qualifying pass marks (%)
	End of course	90	100		
1	Essay	20	20	6 Questions [3in Obs, 3 in Gyn.] (3 hours)	45 % in theory
2	MCQ	20	20	T/F type 20 and SBA 30 – 3 hours	
3	OSCE	10	10	10 + 10 min / student	
4	Obstetric case	20	25	30 min	50%
5	Gynaecological case	20	25	30 min	
	Continuous assessment	10		Pre-professorial common OSCE and Log book	

5.16.4. References

- Obstetrics by Ten Teachers, 20th Edition by Louise Kenny, Helen Bickerstaff, Jenny Myers
- Gynaecology by Ten Teachers, 20th Edition by Louise Kenny, Helen Bickerstaff, Jenny Myers
- Oxford Handbook of Obstetrics and Gynaecology 3nd Edition by Sally Collins, Sabaratnam Arulkumaran, Kevin Hayes, Simon Jackson, and Lawrence Impey
- Green-top Guidelines - RCOG
- Best Practice in Labour and Delivery, 2nd Edition by Sir Sabaratnam Arulkumaran
- National - Ministry of Health guidelines

5.17. Paediatrics

[Person in Charge- Head Paediatrics]

Aims of the undergraduate paediatric teaching programme is to provide the desired knowledge, skills and attitudes to practice as a first contact doctor and lay the foundation for further learning in relation to child and adolescent health.

Overall Objectives

1. Possess an attitude towards medicine that is both scientific and humane and have the characteristics of high ethical standards required for professional life.
2. Possesses knowledge, skills and attitudes that will enable the holistic management of medical problems affecting individuals and community.
3. Be able to deal appropriately with all paediatric emergencies utilizing the facilities available.
4. Be aware of the limitations of knowledge and skills and be prepared to seek help when necessary.
5. Be able to work in a team and provide leadership in activities related to health.
6. Be able to provide medico-legal services to the judicial system of the country.
7. Be able to assess evidence both as to its reliability and relevance and appreciate that conclusions are reached by logical deductions.
8. Be able to continue self-directed learning and contribute towards progress of medical sciences.
9. Demonstrate knowledge of the interaction between man and the environment and their responsibility in promoting a healthy environment.
10. Be able to communicate effectively with fellow practitioners, patients and their families, other professionals and public.

5.17.1. Intended Learning Outcomes

On successful completion of the paediatric program, students should be able to achieve the following ILOs.

These are listed under ten major headings.

1. Patient care
2. Knowledge for practice
3. Practice based learning and improvement
4. Communication and inter-personal skills
5. Professionalism
6. Health care systems based practice
7. Inter- personal collaboration
8. Personal and professional development
9. Promoting health and preventing disease in the community
10. Assisting the legal system in the administration of justice

The paediatric training programme involves delivery of knowledge, imparting skills and attitudes through a variety of educational methods. These include lectures, small group discussions, clinical lecture demonstrations and ward teaching sessions.

5.17.1. Intended Learning outcomes

Topic	**Growth & development**
Aim	• To understand normal and abnormal growth patterns of the children. • Identify age appropriate developmental milestones and be able to identify the deviations
Intended Learning Outcomes	• Explain the normal growth and the development • Explain and demonstrate the ability to use growth charts in the longitudinal evaluation of height weight and head circumference • Analyse abnormalities of growth charts which need further evaluations such as crossing the centiles, discrepancies between weight height and OFC, Short stature, Tall stature, Growth faltering, obesity, Microcephaly, Macrocephaly • Familiarize with Normal patterns of development in order to detect deviations • Summarize the key developmental areas at 6, 9,12,18 months, 2,3,4 and 5 years of age. • Evaluate a child with developmental delay • Plan the multidisciplinary approach to a child with special needs

Topic	**Nutrition**
Aim	• Understand the nutritional needs of the infants and children • Know about healthy eating habits and calculate caloric counting • Understand the malnutrition;
Intended Learning Outcomes	• Demonstrate clear knowledge on breast feeding, the lactation process, basic composition of breast milk, benefits and disadvantages of breastfeeding and formula feeding, differences and similarities between human milk, cow milk and commonly used infant formula • Outline the advice to parents regarding infants feeding like hunger cues, breastfeeding technique, adequacy of breast feeding • Extend healthy eating habits in children and know the food pyramid • Recognize when nutritional assessment is necessary and demonstrate how to obtain a daily diet and be able to calculate the calorie intake. • Recognize and be able to identify various nutritional deficiencies such as undernutrition, obesity, Vitamin A, D, B, E, and K deficiency, mineral deficiencies Iron, Coper and Zn • Distinguish relationship of disease and nutritional status • Evaluate a child with malnutrition and create a diet plan for them within their financial limit.

Topic	**Infection & immunology**
Aim	• Know the aetiology, pathophysiology, natural history and management of common infection in Sri Lanka • How to approach a child with fever, pathophysiology of sepsis and septic shock
Intended Learning Outcomes	• Explain how to evaluate a child with fever • Identify the aetiology, pathophysiology clinical features natural history and management of common infections in Sri Lanka • Formulate a plan for patient with pyrexia of unknown origin • Explain the pathophysiology of sepsis and septic shock • Outline regarding the current national immunization schedule and the disease that are prevented by vaccination. • Apply the basics of anaphylaxis and the management

Topic	**Neonatology**
Aim	• Normal newborn care • Neonatal problems such as problems of prematurity, low birth weight, baby of diabetic mother • Neonatal complications such as birth asphyxia neonatal sepsis neonatal seizures • Perform basic new-born resuscitation

Intended Learning Outcomes	• Explain basis of normal newborn care • Perform the routine examination of a newborn baby and identify the variation from normal • Evaluate the gestational age of the baby • Explain the terms small for gestational age, large for gestational age low birth weight, very low birth weight, prematurity, and extreme prematurity. • Identify the problems of prematurity and low birth weight • Recognize neonatal jaundice, evaluate a baby with jaundice plan an appropriate management • Recognize the respiratory distress in new-born, evaluate the severity and describe the management • Explain how to approach a baby of diabetic mother • understand the birth complications like birth asphyxia and the basic principles of new-born resuscitations • Relate the aetiology, pathophysiology natural history and management of common neonatal problems like neonatal sepsis and neonatal convulsions • Explain neonatal hypoglycaemia and able to evaluate a child with hypoglycaemia • Plan a reasonable differential diagnosis and evaluation for new-born with lethargy and poor feeding, cyanosis, bilious and nonbilious vomiting, jitteriness or seizures, sepsis and collapsed baby. • Identify certain congenital abnormalities and know the referral pathway for them such as cleft palate/lip, developmental dysplasia of hip, Talipes. • Apply the basic chromosomal defects and the clinical manifestations like Trisomy 21, Turner.

Topic	**Renal**
Aim	• Urinary tract infection in children • How to approach a child with proteinuria /haematuria • Basis of acute and chronic renal failure
Intended Learning Outcomes	• Distinguish a child with proteinuria/haematuria • Explain the aetiology, pathophysiology clinical features and management of acute and chronic renal failure in children • Formulate a plan of management for child with urinary tract infection, AGN and Nephrotic syndrome • Evaluate a child with voiding dysfunctions
Topic	**Cardiovascular system**
Aim	• Basis of acyanotic and cyanotic congenital heart disease in children • Common acquired heart disease in children

Intended Learning Outcomes	• Recall the embryology of the cardiovascular system • Explain common acyanotic heart disease depending on the clinical sings • Distinguish different cyanotic heart diseases • Analyse the investigations in relation to the differential diagnosis • Plan management for common cardiovascular problems • Explain the aetiology, pathophysiology, clinical presentation and natural history of common acquired heart diseases in children such as Rheumatic Heart disease and Kawasaki disease. • Evaluate and outline management plan for a child with heart failure • Recommend regarding prevention and management of infective endocarditis.
Topic	**Respiratory system**
Aim	• Basis of wheezing in a child and stridor in a child • Common respiratory infection in children • Bronchial asthma in children
Intended Learning Outcomes	• Evaluate a child with wheezing • Evaluate a child presenting with stridor • Explain the aetiology, pathophysiology clinical presentation and natural history of common respiratory infection such as bronchiolitis, pneumonia, tuberculosis. • Plan the investigations in relation to the differential diagnosis • Plan the, management in common respiratory problems • Demonstrate managing a child in an emergency with respiratory distress like acute severe asthma • Evaluate a child with chronic cough and differentiate the possible causes
Topic	**Gastrointestinal system**
Aim	• Acute and chronic Diarrhoea • Constipation • Hepatic failure and portal hypertension
Intended Learning Outcomes	• Distinguish the possible causes of vomiting in children • Evaluate a child presenting with recurrent abdominal pain • Distinguish acute gastro enteritis and dysentery clinically and able to identify relevant investigations. • Assess the hydrations status of a child with diarhoea and outline the management plan for dehydration depending on the severity. • Demonstrate managing a child with hypovolemic shock • Evaluate a child with constipation and formulate a management plan.

	• Distinguish different causes of fulminant hepatic failure in children and manage a child with hepatic failure and portal hypertension.

Topic	**Endocrine system**
Aim	• Hypo and hyperthryodism • Diabetes Mellitus • Pubertal disorders • Disorders of sex differentiations
Intended Learning Outcomes	• Explain the normal physiological functions of the endocrine gland and puberty • Evaluate a child with short statue • List the clinical features of GH deficiency • Appraise the importance of early detection of hypothyrodidism, and know how to manage a child with hypothyrodism and outline the plan of follow up • Evaluate a child with polyurea and polydipsia • Explain the aetiology, pathophysiology and clinical features of diabetes in children and be able to outline the management plan for a child with diabetes. • List possible causes for precautious and delayed puberty and able to investigate to identify the aetiology • Evaluate a child with disorders sex differentiation • Identify the endocrine emergencies and be able to initiate management – Diabetic ketoacidosis, adrenal crisis.
Topic	**Central nervous system**
Aim	• Epilepsy in children • Child with epileptic encephalopathy • Floppy child • Altered conscious level n children • Child with headache
Intended Learning Outcomes	• Explain the aetiology pathophysiology clinical presentation and natural history of CNS infections such as meningitis and encephalitis • Evaluate a child presenting with fever and fit • Identify the neurological emergency and know how to deal with it – status epilepticus • List the conditions which presents with epileptic encephalopathy in children and be able to differentiate by doing appropriate investigations. • Evaluate a floppy child and outline the management plan • Distinguish the possible causes of headache in children and know the red flag signs of increased intra cranial pressure.

	• Demonstrate assessment of the level of consciousness in children and know the possible causes for altered level of conscious in children. • Evaluate a child with recurrent seizures • Summarise neuromuscular disorders in children such as Myasthenia, Muscular dystrophies, Guillain barre • Distinguish developmental delay, developmental regression and static development.

Topic	**Haematology/Oncology**
Aim	• Common haematological problems in children • Common oncological problem in children
Intended Learning Outcomes	• Evaluate a child with pallor • Explain the aetiology pathophysiology, clinical presentation of iron deficiency anaemia and should be able to outline the investigations and construct the management plan for a child with iron deficiency anaemia. • Analyse a child who present with pancytopenia – causes, clinical features, investigations and management. • Evaluate a child presenting with bleeding disorders • Differentiate the causes for abdominal mass • Evaluate a child with lymphadenopathy • Outline the problems that occur in children with malignancies

Topic	**Muskuloskeletal System**
Aim	• Understand the child with joint problems
Intended Learning Outcomes	• Evaluate a child with Limping • Explain the possible causes of painful limp in a child, and be able to distinguish them clinically, formulate appropriate investigation to differentiate them, outline management plan for a child presenting with painful limp • Differentiate common causes of joint pain in children • Evaluate a child with Swollen joint • List the causes of leg length discrepancies in children and how to evaluate them.

Topic	**Miscellaneous**
Aim	• Poisoning and snake bite • Child safeguarding • Prescribing for children
Intended Learning Outcomes	• Identify the common forms of home accident and initiate management • Identify the risks of various type of poisoning such as paracetamol kerosene oil and organophophates • Plan and manage child with acute poisoning and snake bite • Distinguish various forms of child abuse

	• Apply the concept of case conferences and the management of a child who has been harmed • Explain pharmacological basis of treatment of childhood diseases • Demonstrate safe prescribing in neonates and children • List the serious side effects of drugs and how adverse effects of drugs are reported • Distinguish the licenced, unlicenced and off label prescribing in children • Demonstrate reliable and accurate mathematical calculation for doses and IV fluids required in clinical practice.

5.17.2. Detailed syllabus

Term 5		
Topic	**Lecture**	**SGD/PBL/Skill**
Growth & development		
Normal growth	I hour	
Abnormal growth	2 hour	
Anthropometry		2 hours
Normal development	1 hour	
MDT,speech and visual problems	1 hour	
Term 6		
Topic	**Lecture**	**SGD/PBL/Skill**
Nutrition		
Healthy eating habits	1 hour	
Malnutrition	1 hour	
Micronutrient deficiency	1 hour	
Caloric counting	1 hour	
Infection & Immunology		
Febrile child	1 hour	
Sepsis& septic shock	1 hour	
Immunisation (Immunology Module)		2 hours
Term 7		
Topic	**Lecture**	**SGD/PBL/Skill**
Neonatology		
Normal newborn care	1 hour	
Baby of diabetic mother	1 hour	
Prematurity & LBW	1 hour	
Neonatal seizures	1 hour	
Neonatal sepsis	1 hour	
Birth asphyxia	1 hour	
Newborn resuscitation		2 hours
Renal		
Acute renal failure	1 hour	
Chronic renal failure	1 hour	
UTI	1 hour	
Proteinuria/Haematuria	1 hour	
Term 8		
Topic	**Lecture**	**SGD/PBL/Skill**
Cardiovascular system		
Acyanotic heart disease	1 hour	

Cyanotic heart disease	1 hour	
Acquired heart disease - rheumatic fever, Kawasaki disease	2 hour	
Respiratory system		
Wheezing in a child	1 hour	
Stridor in a child	1 hour	
Respiratory infection	1 hour	
Bronchial asthma	1 hour	
Term 9		
Topic	**Lecture**	**SGD/PBL/Skill**
GIT & liver		
Vomiting in children	1 hour	
Acute Diarrhoea	1 hour	
Constipation	1 hour	
Fulminant hepatic failure Portal hypertension	1 hour	
Musculoskeletal system		
JIA	2hour	
Topic	**Lecture**	**SGD/PBL/Skill**
Endocrine		
Short stature & pituitary diseases	1 hour	
Hypo & hyperthyroidism	1 hour	
Diabetes Mellitus	1 hour	
Pubertal disorders	1 hour	
Disorders of sex differentiation	1 hour	
Term 11		
Topic	**Lecture**	**SGD/PBL/Skill**
Hematology/Oncology		
Anemia	1 hour	
Pancytopenia & hematological malignancies	1 hour	
Miscellaneous		
Prescribing in children	1 hour	

Clinical Lecture Demonstration Topics

Topics	Hours
Child with Abnormal development	1 hour
Growth faltering in children	1 hour
Child with pyrexia of unknown origin	1 hour
Newborn with respiratory distress	1 hour
Neonate with jaundice	1 hour
Heart failure in children	1 hour
Chronic cough in a child	1 hour
Child with chronic diairrhoea	1 hour
Fluid &electrolytes abnormalities	1 hour
Limping child	1 hour
Child with polyuria & polydipsia	1 hour
Diabetic emergencies in children	1 hour
Anaemia in children	1 hour
Child with bleeding disorders	1 hour
Epilepsy in children	1 hour
Child with epileptic encephalopathy	1 hour
Floppy child	1 hour
Altered conscious level in children	1 hour
Child with headache	1 hour
Child protection& child safe guarding	1 hour

5.17.3. Summary

	Term 5	Term 6	Term 7	Term 8	Term 9	Term 10	Term 11	Total
Lectures	5	6	10	8	11	0	3	43
SBD/skill	2		2					4
CLD								20
Clinical*								576
Total	7	6	12	8	11	0	3	**643**

**on call hours, casualty nights and weekend duty have not been considered*

5.17.3. Evaluation

Type of Examination		Distribution of Marks- First examination	Distribution of Marks- subsequent examinations	Details of evaluation – eg. No. of hrs No. of question etc.	Qualifying pass marks (%)
Continuous assessment*		**20**			
End of course		**80**	**100**		
1	MCQ+SBA	20	25	20+30 questions-2hrs	45 % in theory
2	Essay	20	25	6 questions-3hrs	
3	Long case	20	25	1 case	50% in clinical
4	Short case	20	25	2 cases	

***CONTINOUS ASSESSEMENT (20%)**

1. Pre professorial in course assessment 2.5 Marks
2. Common OSCE 2.5 Marks
3. Assessment for paediatric logbook 2.5 Marks
4. Assessment at presentation of emergency paediatric topics 0.5 Marks
5. Assessment at Integrated ward class presentation 1.0 Mark
6. End of professorial appointment in course assessment 1.0 Mark
7. OSCE at end of professorial appointment 10 Marks

5.17.4. References

- Illustrated Text book of Paediatrics by Tom Lissauer and Will Carroll 5th Edition, 2018.
- Nelson Text Book of paediatrics. Robert M Kliegman 21st edition 2019
- From birth to five years: Children's Developmental Progress. Mary D Sheridan. 4th edition 2014.
- Standard treatment Protocols in Paedaitrcs & neonatology- 2017 Draft Document Sri Lanka college of paediaitricians
- National guidelines of paediatric respiratory disorders – August 2019
- National guidelines, Ministry of Health care & nutrition -2007

5.18. Surgery

[Person in Charge- Head Surgery]

The subject of surgery is taught, starting from phase II and consists of lectures, tutorials, clinical rotations, regular assessments followed by the final assessment at the end of the course, as part of the Final MBBS examination.

5.18.1. Overall objectives

The purpose of undergraduate surgical training is to prepare the medical students to work in a surgical ward as house officers after passing out and as medical officers thereafter. The clinical training in surgery is to acquire adequate knowledge, achieve clinical skills to diagnosis and treat the most common surgical conditions including surgical emergencies that enable the students to develop a foundation on which they can build up their post graduate training if they opt to specialize in surgery.

5.18.2. Learning Objectives

1. Explain the general principles in surgery and utilize them in the management of surgical patients.
2. Obtain a comprehensive history, elicit physical signs and interpret those findings of a surgical patient and come to a reasonable diagnosis/different diagnosis.
3. Request relevant investigations to arrive a diagnosis.
4. Formulate a basic management plan.
5. Plan appropriate pre-operative assessment of a surgical patient
6. Appreciate the operative theatre practices, universal precautions, sterilization and disinfection, assisting a surgery, basic instrument handling.
7. Plan appropriate post-operative management that includes monitoring, analgesia, fluid management & subsequent management.
8. Understand and manage common surgical emergencies.
9. Understand the principles of management of critically injured patients.
10. Acquire skills in performing simple surgical procedures.
11. Appreciate the importance and need for the careful, accurate and speedy decision making in the setting of the surgical ward.
12. Be familiar with the spectrum of surgical care available and to develop a critical attitude to assess its risks and benefits.

13. Acquire communications skills to advice, counsel and explain about the disease condition, management options with possible outcomes in simple lay terms.
14. Emphasize the important ethical, moral and social issues involved in surgical practice and induce discussion on cost benefit analysis.
15. Understand the role of surgical services to the community with a view to prevention of possible surgical conditions and know ways how surgical patients could be rehabilitated.
16. Acquire knowledge and skills to deal with social aspects of patients and families when delivering health care.
17. Understand the role of surgical audit and research to improve the quality of surgical care. Student also should be able to acquire suitable level of skills on information and data handling.
18. Show enthusiasm to update knowledge and skills by means of continuous medical education that will improve the quality of the practice.
19. Show abilities to take leadership if required and be able to work as a team person maintaining good rapport between medical and non-medical health care personals.
20. Emphasize the public regarding the awareness of preventable surgical conditions.

5.18.3. Intended Learning Outcomes

Topic	**Introduction**
Aim	• Knowledge on surgical curriculum and importance of history of surgery • Explain basic concepts of working in a surgical ward
Intended Learning Outcomes	• Explain the different aspects of undergraduate surgical curriculum • Find importance of knowing the history of surgery • Demonstrate effective communication with patients and relatives • Demonstrate handling unusual situation • Build the importance of team work in the surgical discipline

Topic	**Preoperative Management**
Aim	• Importance of preoperative preparation • Different aspects of preparing a patient for any surgical procedures
Intended Learning Outcomes	• Aspire the general aspects of preoperative preparation • Demonstrate effective preoperative preparation • Distinguish the different aspects of premedication • Demonstrate preparation of patients for different types of surgeries • Organise a patient for surgeries

Topic	**Postoperative management**
Aim	• Importance of effective postoperative care of surgical patients • Identify different components of postoperative care
Intended Learning Outcomes	• Explain the general aspects of postoperative care • Perform complete postoperative monitoring of surgical patients • Plan and mange the postoperative pain effectively • Demonstrate correct fluid and electrolytes balance • Prescribe correct nutritional requirement for surgical patients • Rehabilitate the postsurgical patients effectively

Topic	**Postoperative complications**
Aim	• Common postoperative complications • Common postoperative complications appropriately
Intended Learning Outcomes	• Identify the common postoperative complications • Demonstrate the different causes for postoperative pyrexia and manage them appropriately • Identify the postoperative respiratory failure and know the common causes for it • Treat the postoperative respiratory failure effectively • Recognize the common causes for postoperative bleeding and manage them appropriately • Apply the basic concepts of blood transfusion and its complication with managing those complications appropriately

Topic	**Surgical techniques/technology**
Aim	• Common surgical techniques • Use of technology in surgical procedures
Intended Learning Outcomes	• Explain the different types of surgical wounds • Plan and manage the surgical wounds appropriately • Acquire knowledge on wound healing and its complications • Practice safe surgery • Identify the different surgical procedures • Apply the role of technology in surgical practice
Topic	**Management and legal issues**
Aim	• The concepts of medico legal aspects of surgical practice • Evidence based practice

Intended Learning Outcomes	• Demonstrate importance of medico legal aspects in surgical practice • Manage the surgical patients ethically • Solve management errors and medical negligence • Apply the importance of evidence-based surgery • Identify the importance of research, audit and clinical governance in surgical practice
Topic	**Surgical microbiology**
Aim	• The relevance of microbiology in surgical practice • Different types of surgical infections
Intended Learning Outcomes	• Explain about surgical site infection • Prevent surgical site infections • Demonstrate common and uncommon infections in surgical practice • Demonstrate usage of antibiotics in surgical practice • Identify the importance of standard precautions and prevention of transmission of infections
Topic	**Surgical Radiology**
Aim	• The role of radiology in surgical practice • Different types imaging done in surgical patients
Intended Learning Outcomes	• Explain the role of imaging in surgical practice • Choose appropriate radiological investigations • Demonstrate preparing patients for common radiological investigations • Interpret common radiological investigations

Topic	**Musculoskeletal disorders**
Aim	• Different musculoskeletal disorders in surgical practice • The principles of management of common musculoskeletal disorders
Intended Learning Outcomes	• Demonstrate principles of management of fractures • Plan the management of common dislocations • Explain bone and joint infections and their management • Summerise common tumours musculoskeletal system • Demonstrate biomechanics, diagnosis, and management of sports injuries • List the common conditions of the spine and vertebral column • Analyse common orthopaedic disorders in children

Topic	**Critical care**
Aim	• Role of critical care in surgical patients
Intended Learning Outcomes	• Discuss surgical patients in critical care unit • Monitor surgical patients in critical care setup • Plan and manage surgical patients in critical care units
Topic	**Gastrointestinal Tract**
Aim	• Common surgical conditions of gastrointestinal tract • The principles of management of common surgical conditions of GIT
Intended Learning Outcomes	• Explain congenital anomalies of gastrointestinal tract and relevant structures • Distinguish benign and malignant conditions of gastrointestinal tract • Discuss peritonitis intra-abdominal abscesses • Demonstrate pathophysiology of intestinal obstruction • Elaborate the common anal and perianal conditions
Topic	**Breast**
Aim	• Benign and malignant conditions of the breast
Intended Learning Outcomes	• Discuss benign conditions of the breast • Explain the aetiology, pathophysiology, natural history and management of carcinoma of breast
Topic	**Hepatobiliary system, pancreas and spleen**
Aim	• Common surgical conditions of Hepatobiliary system • Common surgical conditions of pancreas and spleen
Intended Learning Outcomes	• Demonstrate the aetiology, pathophysiology and management of common surgical conditions of Hepatobiliary system • List the endocrine tumours of the pancreas • Identify disorders of spleen in relevant to surgical discipline

Topic	**Genito-Urinary System**
Aim	• Common surgical conditions of genito-urinary system • The principles of management of common surgical conditions of genito-urinary system
Intended Learning Outcomes	• Explain congenital anomalies of genito-urinary system • Summarise aetiology, pathophysiology and management of Urolithiasis • Distinguish aetiology, pathophysiology and management of urinary tract infection • Demonstrate common penile conditions • Plan and mange the common testis conditions

Topic	**ENT Surgery**
Aim	• Common conditions of ENT relevant to surgical practice
Intended Learning Outcomes	• Plan and manage common ENT surgical problems • Identify and treat upper airway obstruction • Distinguish the indications and care of tracheostomy
Topic	**Vascular disorders**
Aim	• Common vascular surgical conditions • The principles of management of common vascular surgical conditions
Intended Learning Outcomes	• Investigate the patients with the vascular disorders appropriately • Discuss aetiology, pathophysiology and management of acute limb ischaemia • Explain causes and clinical presentation and management of unilateral leg swelling • Demonstrate handling patients with vascular malformations
Topic	**Endocrine System**
Aim	• Common endocrine conditions and their management
Intended Learning Outcomes	• Plan and manage the patients with different disorders of thyroid gland • Explain clinical presentation and management of parathyroid tumours • Discuss about phaeochromocytoma and other endocrine disorders

Topic	**Head and Neck**
Aim	• Common conditions of head and neck in surgical practice
Intended Learning Outcomes	• Demonstrate aetiology, clinical presentation and management of diseases of salivary glands • Illustrate about neck lumps • Plan and manage oral ulcers appropriately
Topic	**Paediatric Surgery**
Aim	• Common paediatric surgical conditions
Intended Learning Outcomes	• Discuss aetiology, clinical presentation and management of common paediatric surgical conditions
Topic	**Neurosurgery**
Aim	• Head injury and its consequences • The basic concepts of management of CNS tumours
Intended Learning Outcomes	• Demonstrate aetiology, clinical presentation and management of intracranial haemorrhages • Discuss basic concepts of management of central nervous system tumours

Topic	**Ophthalmology**
Aim	• Common ophthalmologic conditions in surgical practice
Intended Learning Outcomes	• Demonstrate aetiology, clinical presentation and management of common ophthalmologic conditions
Topic	**Tissue Transplantation**
Aim	• Basic principle of tissue transplantation
Intended Learning Outcomes	• Discuss immunological basis of tissue transplantation • Apply the concepts of medico legal aspects of tissue transplantation • Demonstrate the different types of tissue transplantation • Explain the complications of tissue transplantation and their management
Topic	**Oncology**
Aim	• Principle of management of patients with cancers • Role of medical practitioner in managing cancer patients
Intended Learning Outcomes	• Explain basis of cancer screening • Apply the principle of treatment of common cancers • Demonstrate knowledge on communicating with cancer patients and their care givers • Apply the concept of palliative care

5.18.4. Detailed syllabus

Term 5		
Topic	**Activity**	**Duration**
Introduction		
Understanding the Undergraduate Surgical Curriculum	Lecture	1 hour
History of Surgery	Lecture	1 hour
Communication skills-psychological aspects, breaking bad news, working in teams	Lecture	1 hour
Preoperative Management		
Preoperative assessment, optimization, premedication and modification of current drug therapy, preoperative fasting	Lecture	2 hours
Postoperative management		
Postoperative monitoring, Postoperative pain management	Lecture	1 hour
Fluid and electrolyte management in surgical patient, Nutritional support in surgical patient, Rehabilitation	Lecture	1 hour
Postoperative complications		
Postoperative pyrexia	Lecture	1 hour
Postoperative respiratory failure, Oxygen therapy and ventilation	Lecture	1 hour
Hemorrhage and blood transfusion	Lecture	1 hour

Term 6		
Topic	**Activity**	**Duration**
Surgical techniques/technology		
Surgical wounds: Classification, Management principles, wound healing & complications.	Lecture	1 hour
Surgical safety in operating theatre	Lecture	1 hour
Surgical procedures: Minor procedures, Day surgery, Endoscopic and Laparoscopic surgeries	Lecture	1 hour
Management and legal issues		
Medico legal aspects, Medical litigation-avoiding management errors, ethics, medical negligence	Lecture	2 hours
Evidence based surgery, statistics, trials, research, audit, clinical governance	Lecture	1 hour
Surgical microbiology		
Source of surgical infection, Prevention of infection-asepsis, antisepsis	Lecture	1 hour
Antibiotic use-common drugs, selection, resistance	Lecture	1 hour
Surgery in Hepatitis and HIV carries-blood borne viruses, universal precautions, surgical precautions, immunization, management of sharps injuries	Lecture	1 hour
Special infection-clostridia, mycobacteria Nosocomial infections	Lecture	1 hour
Term 7		
Topic	**Activity**	**Duration**
Surgical Radiology		
Preparation of surgical patients for common radiological investigations Interpretation of common radiological investigation	Lecture	2 hours
Genito-Urinary System		
Urolithiasis	Lecture	1 hour
Urinary tract infection, Urinary fistulas and Diverticulae of the bladder	Lecture	1 hour
Penile conditions: phymosis, paraphymosis, inflammation, carcinoma	Lecture	1 hour
Problems of the testis: torsion, varicocele, hydrocele and other cystic lesions, infection, tumours	Lecture	1 hour
Congenital abnormalities of Genito (male) Urinary System	Lecture	1 hour
Critical care		
Assessment and monitoring of surgical patient in critical care unit	Lecture	1 hour
Term 8		
Topic	**Activity**	**Duration**
Vascular disorders		
Investigations for the vascular disorders Problem oriented lecture on acute limb ischaemia	Lecture	1 hour

Unilateral leg swelling Vascular trauma and compartment syndrome	Lecture	1 hour
Vascular malformations Abdominal Aortic Aneurysm and other aneurysms	Lecture	1 hour
Paediatric Surgery		
Common paediatric surgical conditions	Lecture	1 hour
ENT Surgery		
Common ENT problems Upper airway obstruction and tracheostomy	Lecture	1 hour
Tissue Transplantation		
Principle of Tissue Transplantation	Lecture	1 hour

Term 9		
Topic	**Activity**	**Duration**
Gastro Intestinal Tract		
Congenital anomalies of oesophagus, Stomach, and Duodenum Congenital anomalies diaphragm	Lecture	1 hour
Benign and malignant conditions of oesophagus	Lecture	1 hour
Benign and malignant conditions of Stomach	Lecture	1 hour
Gastric outlet obstruction - Adults and paediatric age group	Lecture	1 hour
Peritonitis Abdominal and pelvic abscesses	Lecture	1 hour
Intestinal obstruction Causes of Acute, sub-acute & Chronic, Paediatric and Understanding the pathophysiology	Lecture	1 hour
Anal conditions Painful and Painless-Anal fissure, Anal carcinoma, Incontinence of feces, perianal abscess, perianal fistula, Rectal prolapse	Lecture	1 hour
Hepatobiliary system and pancreas		
Common surgical conditions of Hepatobiliary system Carcinoma and endocrine tumors of the pancreas	Lecture	1 hour
Splenomegaly, Hypersplenism and splenectomy	Lecture	1 hour
Musculoskeletal disorders		
Principles of management of fractures and dislocations, Individual bone fractures	Lecture	2 hours
Infection of bone and joints, Tumours of the musculoskeletal system	Lecture	2 hours
Sports injury-biomechanics, diagnosis, and management	Lecture	1 hour
The spine and vertebral column	Lecture	1 hour
Common paediatric orthopaedic disorders -congenital disorders, disorders of growing skeleton	Lecture	1 hour

Term 10		
Topic	**Activity**	**Duration**
Endocrine System		
Thyroid disorders - Thyroid malignancies & benign conditions	Lecture	1 hour
Parathyroid tumours Phaeochromocytoma & Multiple Endocrine Neoplastic (MEN) Syndrome	Lecture	1 hour
Breast		
Benign and malignant conditions of the breast	Lecture	1 hour
Term 11		
Topic	**Activity**	**Duration**
Head and Neck		
Diseases of the salivary glands	Lecture	1 hour
Neck lumps other than thyroid Oral cavity – Ulcers	Lecture	1 hour
Neurosurgery		
Intracranial haemorrhages	Lecture	1 hour
Intracranial / Spinal tumours	Lecture	1 hour
Ophthalmology		
Common Ophthalmological problems	Lecture	1 hour
Oncology		
Basis of cancer treatment and Cancer screening	Lecture	1 hour
Breaking bad news in cancer patients and communication skill Palliative care	Lecture	1 hour

5.18.5. Summary:

	Term 5	Term 6	Term 7	Term 8	Term 9	Term 10	Term 11	Total
Lecture	10	10	08	07	15	03	07	60
Clinicals								1044
Skill lab								06
CLD								30
Total								1140

**on call hours, casualty nights and weekend duty have not been considered*

5.18.5. Evaluation

Type of Examination		Distribution of Marks- First examination	Distribution of Marks- subsequent examinations	Details of evaluation – eg. No. of hrs No. of question etc.	Qualifying pass marks (%)
Continuous assessment*		**20**			
End of course		**80**	**100**		
1	MCQ+SBA	20	25	20+30 questions-2hrs	45 % in theory
2	SAQ	20	25	10 questions - 3 hours	
3	Long case	20	20	Observed history taking and focused clinical examination (15min) Case preparation (05min) Case discussion (10min)	50% in clinical
4	Short case	20	20	Bay one – 3 cases (15min) Bay two – 3 cases (15min)	
5	OSCE/OSVE		10**	10 stations, 30 minutes (minimum 3 minutes each)– at the end of professorial clerkship	

***CONTINOUS ASSESSEMENT (20%)**

1. Pre professorial In course assessment — 08 Marks
   At the end of first and second surgical appointments.
   MCQ (10 SBR & 10 T/F)
   4 marks for each examination
2. Common OSCE — 02 Marks
3. OSCE at end of Professorial clerkship — 05 Marks
4. OSVE — 05 Marks
   15 minutes – scrutiny of log / procedure book, common surgical emergencies and common ward surgical procedures to be assessed
   at the end of professorial clerkship

****Subsequent exams will include both OSCE for 5 marks and OSVE for 5 marks**

5.18.6. References:

1. Bailey & Love's Short Practice of Surgery.N .L.Williams N.L., Ronan O'Connell .P., Andrew McCaskie : 27th Edition, CRC press, Portland, United States 2018.

2. Scott – An Aid to Clinical Surgery. Williamson, R. C.; Waxman, B. P., Edinburgh: 6th Edition, Churchill Livingstone, 2003. Reprinted in 2012.

3. Browse's Introduction to the Symptoms and Signs of Surgical Diseases. Kevin G Bumand, John Black, Steven A. Corbett: 5th edition, CRC press, 2014.

4. Hamilton Bailey's Physical Signs: Demonstrations of Physical Signs in Clinical Surgery. John S.P. Lumley, Anil K. D'Cruz, Jamal J. Hoballah, Carol E.H. Scott-Conner: 19th Edition, CRC press, 2016.

5. Sabiston Textbook of Surgery. Courtney Townsend R. Daniel Beauchamp B. Mark Evers Kenneth Mattox: 20th Edition, Elsevier, 2016.

6. Lecture notes on general surgery. Harold Ellis., Sir Roy Y. Calne and Christopher J.E.Watson, 13th Edition, Blackwell Scientific, 2016.

7. Adams's Outline of Fractures: Including Joint Injuries. David L. Hamblen, Hamish Simpson. 12th Edition, London: Churchill Livingstone, 2007

8. Ward procedures in surgery. Gayan Ekanayake. Edited by Aloka Pathirana. 6th Edition. Sri Lanka, 2012.

9. Ministry of Healthcare & Nutrition National Guidelines, Sri Lanka, 2007.

5.19. Psychiatry

[Person in Charge- Head Psychiatry]

The aim of the subject psychiatry in medical undergraduate course is to facilitate the students to develop knowledge of normal human behaviour and the abnormalities that can occur, and to acquire skills and attitudes needed to manage patients with psychological problems.

Overall Objectives

- Explain the basic psychology of human behaviour.
- Recognize the concept of mental health and psychosocial wellbeing.
- Know the influence of psychosocial factors on the psyche in normal and abnormal situations.
- Describe the effects, side effects and toxic effects of drugs which modify the functions of mind.
- Observe and apply the knowledge of psychopharmacology in clinical scenarios.
- Identify abnormal states of mind.
- Explain the terminology related to basic psychopathology and use them correctly.
- Describe the symptoms and signs of common mental illnesses.
- Apply the concepts and basic classification of mental illness.
- Practice good communications skills in normal settings and in approaching a person with psychological problems or mental illnesses.
- Take and compile a good psychiatric history.
- Perform and present the mental state examination findings.
- Recognize, assess and diagnose common mental illnesses.
- Design appropriate, individually tailored management plan for common mental illnesses.
- Provide basic counselling to the needy ones.
- Familiarise the basic rehabilitation principles.
- Explain the psychology related to family and social dynamics.
- Develop skills in dealing with family issues and educating the family members.
- Recognize the impact of physical and mental illnesses on families and societies.
- Recognize and acknowledge their limitations and make appropriate referrals.
- Respect the humanitarian principles and patients' rights.
- Relate basic ethical values and legal issues related to psychiatry and apply them in necessary practical situations.
- Explain promotion of mental health and prevention of mental illnesses in a community and population context.

The teaching learning activities include lectures, small group discussions, tutorials, presentations, group work, field visits and clinical attachment.

5.19.1. Intended Learning outcomes

Topic 01	**Concepts in Mental Health in Personal and Professional Development Strand**
Aim	The aim of personal and professional development strand is to develop personal skills to face challenges in university life successfully, become a competent and compassionate doctor, improve skills that are necessary for self-care and patient management as well as producing socially accountable and responsible medical graduate.
Intended Learning Outcomes	• Explain the conceptual issues in mental health and mental disorders, which include: o Adapting to new environment o Factors affecting behaviour at the individual level and in group settings. o Ways of changing behaviour including motivational interviewing and brief interventions. o The beliefs and myths of general public towards mental wellbeing, mental illness, mentally ill and treatment of mental illness o Familiarizing with social concepts, discrimination, stigma, and prejudices, and measures to overcome them. • Outline psychological theories, development and phenomena of: o Emotion o Learning and memory o Intelligence o Freudian theory o Developmental psychology o Personality o Reaction to stress (individual and society) , grief and bereavement, sick role and illness behaviour and doctors role in such situations e.g. breaking bad news o Sociological concepts and regulations related to patient care o Family society and culture o Attitudes and stigma o Human rights o Conflict resolution o Anger and anger management o Team work o Psychological aspects of death and dying • Discuss psycho - sexual development and human sexuality
Topic 02	**Patient evaluation**
Aim	The aim of this section is to make sure that the medical graduates have a sound knowledge and skills to understand and evaluate persons who present with abnormal state of mind.

Intended Learning Outcomes	• Demonstrate ability to take a psychiatric history (including taking a collateral history), systematically covering up the following areas: o Presenting complaint with duration o History of presenting complaint o Mental health problems in the past o Medical problems o Family history of illnesses o Personal history (including developmental history, social history, substance use, forensic issues, and premorbid personality) • Demonstrate ability to conduct a mental state examination, in an organized manner which includes: o Appearance and behaviour o Speech (rate, tone, volume, quantity, relevance, coherence and flow) o Mood (nature, congruity and reactivity, suicidal ideation, depersonalization and derealisation) o Thought content (preoccupations, delusions, overvalued ideas, phobias, obsessions, negative cognition, thoughts of harming others) and formal thought disorder o Perceptual abnormalities (hallucinations, illusions and imageries) o Cognition –(orientation, attention, concentration, memory and IQ) o Insight • Demonstrate the ability to perform a relevant physical examination and request relevant investigations
Topic 03	**Risk Assessment**
Aim	The aim of this section is to enhance the students with the knowledge and skills pertaining to identify the risks in relation to self-harm and others.
Intended Learning Outcomes	• Demonstrate the ability to assess risk of suicide or deliberate self-harm • Distinguish the ability to assess risk of violence and homicide • Analyse the ability to assess other relevant risks – for example, the risk of self-neglect and absconding risk
Topic 04	**Communication and counselling skills**
Aim	The aim is to develop the undergraduates as good communicators and empower them to support others using basic counselling skills.
Intended Learning Outcomes	• Discuss the doctor patient relationship • Elaborate elements of basic communication • Demonstrate good communication skills (verbal and non-verbal) needed in doctor patient relationship • Demonstrate empathy towards patients • Apply patient's rights in healthcare

	• Demonstrate ability to take informed consent for medical procedures • Show ability to maintain patient confidentiality • Apply ethical behaviour when dealing with patients and families • Explain difficulties and dilemmas in doctor patient relationship • Demonstrate managing a defined range of difficult situations (violent patient, non-communicative patient and a patient with challenging behaviour). • Elucidate the impact of interpersonal skills on establishing effective relationships • Demonstrate the ability to psycho-educate a patient and the family • Explain definition and process of counselling • Demonstrate basic counselling skills • Discuss steps in problem solving counselling • Demonstrate problem solving counselling in a defined range of clinical situations • Elaborate available counselling services in Sri Lanka
Topic 05	**General Adult Psychiatry**
Aim	The aim of this section is to impart a sound knowledge on the common psychiatric conditions which enables the medical graduate to identify, diagnose, provide first line management, make appropriate referrals and engage in long term follow up.
Intended Learning Outcomes	**Depression** • Discuss epidemiology of depression • Explain aetiology of depression • List the ICD 10 criteria for diagnosis of a depressive episode • Demonstrate ability to diagnose depression • Distinguish different presentations of depression (including somatization, irritability, aggression and alcohol misuse etc.) • Demonstrate ability to assess the risks in a patient with depression • Discuss management of depression (pharmacological and non-pharmacological) • Demonstrate awareness as to when a patient with depression should be referred for specialist care. • Prescribe medications used in treating depression and their side effects: Selective Serotonin Reuptake Inhibitors (SSRIs), venlafaxine, Tri Cyclic Antidepressants (TCAs) • Discuss recurrent depression and resistant depression • Explain common associations, co-morbidities and prognosis of depression

	Bipolar Affective Disorder • Discuss epidemiology of bipolar affective disorder • Explain aetiology of bipolar affective disorder • Elaborate clinical features and ICD 10 diagnostic criteria for manic episode and hypomanic episode. • Apply diagnostic criteria of bipolar affective disorder. • Discuss common differential diagnoses of bipolar affective disorder • Explain clinical presentations and evaluation of bipolar affective disorder in children, adults and the elderly • Relate the risk assessment of a patient with bipolar affective disorder • Outline the management of bipolar depression. • Discuss acute and long-term pharmacological management including use of lithium, sodium valproate and antipsychotics in bipolar affective disorder. • List the common side effects, monitoring, drug interactions and toxicity of lithium. • Illustrate the importance of psychoeducation, involvement of family, identifying early signs of relapse, contingency plans and psychological approach for relapse prevention • Outline common co-morbidities of bipolar affective disorder • Predict prognosis of bipolar affective disorder **Schizophrenia** • Explain epidemiology, including course and prognosis of schizophrenia • Summarise aetiological factors in schizophrenia, including the neurodevelopmental basis of aetiology. • Identify clinical features and diagnostic criteria of schizophrenia. • Distinguish differential diagnoses of schizophrenia (e.g. mood episodes with psychotic symptoms, drug induced psychotic disorders, delusional disorders and psychotic disorders of organic aetiology) • Discuss psychoeducation in management of schizophrenia • Plan psycho-social management of a patient with schizophrenia • Discuss indications, mode of prescribing and side effects of commonly used antipsychotic medications e.g. risperidone, olanzapine, clozapine, trifluoperazine, haloperidol and aripiprazole • Distinguish indications for use, mode of administration and side effects of depot preparations - fluphenazine decanoate and flupenthixol decanoate.

- Discuss the management of patients who develop side effects of medications - dystonia, akathesia, parkinsonian side effects, tardive dyskinesia and metabolic syndrome.
- Plan appropriate follow up of a discharged patient
- Define the term resistant schizophrenia'

Other psychotic disorders

- Discuss presentations and symptoms of schizoaffective disorder, acute psychotic episode, delusional disorders and organic psychotic disorders
- Outline the management principles of above mentioned disorders

Anxiety Disorders and stress related disorders

- Distinguish distinction between fear, stress, normal anxiety and pathological anxiety

Social phobia:

- Discuss epidemiology of social phobia
- Define clinical features and ICD 10 diagnostic criteria for social phobia
- Discuss pharmacological management of social phobia
- Elaborate the psychological management of social phobia

Agoraphobia:

- Discuss demographical characteristics of agoraphobia
- Define clinical features and ICD 10 diagnostic criteria for agoraphobia
- Discuss pharmacological management of agoraphobia
- Elaborate psychological management of agoraphobia

Panic disorder:

- Discuss demographical characteristics of panic disorder
- Define clinical features and ICD 10 diagnostic criteria for panic disorder
- Discuss pharmacological management of panic disorder
- Elaborate the psychological management of panic disorder

Generalized Anxiety Disorder (GAD):

- Discuss demographical characteristics of GAD
- Define clinical features and ICD 10 diagnostic criteria for GAD
- Discuss pharmacological management of GAD
- Elaborate psychological management of GAD

Obsessive Compulsive Disorder (OCD)

- Discuss demographical characteristics of OCD
- Define clinical features and ICD 10 diagnostic criteria for OCD

	• Discuss pharmacological management of OCD • Elaborate psychological management of OCD **Post-Traumatic Stress Disorder (PTSD)** • Discuss demographical characteristics of PTSD • Define clinical features and ICD 10 diagnostic criteria for PTSD • Discuss pharmacological management of PTSD • Elaborate psychological management of PTSD • Outline the co-morbidities of PTSD **Adjustment Disorder** • Discuss clinical features and ICD 10 diagnostic criteria for adjustment disorder • Elaborate psychological management of adjustment disorder **Body Dysmorphic Disorder (BDD)** • Discuss clinical features and ICD 10 diagnostic criteria for BDD **Dissociative and Somatoform Disorders** • Discuss clinical features and presentations of conversion disorder • Apply management principles of conversion disorders • Demonstrate ability to distinguish depersonalisation, dissociative amnesia, dissociative fugue, dissociative trance and dissociative identity disorder • Discuss clinical features and presentations of hypochondriasis • Elaborate clinical features and presentations of somatization disorder • Discuss malingering. **Puerperal Disorders** • Define epidemiology of puerperal disorders • Discuss the presentations, signs and symptoms of puerperal disorders (post- partum blues, mood disorders and psychotic disorders) • Demonstrate ability to carry out an assessment of a mother (and be aware of the Edinburgh scale used by primary care teams) • Apply principles of management of puerperal disorders in a tertiary care unit • Discuss referral and shared care of puerperal disorders • Distinguish how these disorders are related to 'other adult psychiatric disorders'

	Personality Disorders • Demonstrate basic knowledge on dissocial, emotionally unstable and anankastic personality disorders.
Topic 06	**Child and adolescent psychiatry**
Aim	To develop the knowledge, skills and attitude to deal with common child and adolescent psychiatric conditions

Intended Learning Outcomes	• Discuss aetiology, clinical features, and presentations and demonstrate ability to manage;
	  • Behavioural disorders- attention deficit hyperactivity disorder, oppositional defiant disorder and conduct disorder
	  • Emotional disorders- childhood and adolescent depression, anxiety disorders, phobic anxiety disorder, school refusal, separation anxiety disorder, panic disorder, obsessive compulsive disorder
	  • Developmental disorders- autism spectrum disorders, learning disability, specific learning disabilities
	  • Other disorders during childhood/adolescents- tics, encopresis and bed wetting, pica, eating disorders,
	  • Onset of major psychiatric disorders in childhood such as schizophrenia and BAD
	• Demonstrate ability to communicate with children (setting, communication skills and skills in engagement with the child)
	• Demonstrate ability to gather information from parents and care givers
	• Elaborate impact of different symptoms on the child's functioning.
	• Discuss impact of child's illness/ behaviours on family and peers
	• Distinguish disorders commencing in adolescence and principles of management e.g. eating disorders
	• Discuss the existing service structure and the referral process for specialized care in the locality

Topic 07	**Psychiatry of the elderly**
Aim	To develop the knowledge and skills for managing common mental health problems in the elderly

Intended Learning Outcomes	• Discuss physiological changes of normal aging in the brain and body
	• Demonstrate basic knowledge of special circumstances related to aging
	  • Vulnerability / elder abuse
	  • Bereavement, social isolation
	  • Poverty
	  • Mental capacity, power of attorney
	  • Advanced directives
	  • Legal safeguards

	• Care arrangements • Define epidemiology of elderly population and mental illnesses of old age • Discuss statistics of elderly population and expected rise in elderly population • Elaborate epidemiology of common psychiatric disorders in the elderly (dementia, delirium, mood and anxiety disorders and psychosis) **Delirium** ▪ Discuss aetiology of delirium (medical conditions, neurological conditions, drugs and other) ▪ Define clinical features and ICD 10 diagnostic criteria for delirium ▪ List the differential diagnosis of delirium ▪ Elaborate management of delirium **Dementia** ▪ Define aetiology and risk factors of dementia (neurodegenerative, vascular, inflammatory/ autoimmune, trauma, infections, metabolic and endocrine, neoplastic, post anoxia, post radiation, nutritional deficiencies, toxins and other medical conditions) ▪ Distinguish the types of dementia (Alzheimer's, vascular, Lewy body, fronto-temporal, prion disease and normal pressure hydrocephalus) ▪ Discuss clinical features and ICD 10 diagnostic criteria for dementia ▪ List differential diagnosis of dementia ▪ Explain the pharmacological, psychological and social management of dementia ▪ Demonstrate ability to psycho-educate care givers ▪ Define the term mild cognitive impairment (MCI) **Other neuropsychiatric disorders** ▪ Discuss neuropsychiatric manifestations of Parkinson's disease and normal pressure hydrocephalus
Topic 08	**Sexual dysfunction, disorders of sexual preferences and gender related issues**
Aim	The aim of this section is to develop the knowledge and ability to understand the common problems in human sexuality, and their management.
Intended Learning Outcomes	• Define the terms premature ejaculation, erectile dysfunction, vaginismus and common paraphilia • Plan management of premature ejaculation, erectile dysfunction and vaginismus • List medications that commonly cause sexual side effects

	• Define sexual orientation, gender identity and gender dysphoria • Discuss challenges faced by LGBT (lesbian gay bi and transsexual) individuals
Topic 09	**Substance abuse, abuse of prescription medicine and related mental health problems**
Aim	To develop the knowledge and skills in understanding and managing substance use disorders
Intended Learning Outcomes	• Define epidemiological factors in substance abuse • Apply ICD 10 criteria for disorders of substance abuse • Discuss physical, mental and psychosocial consequences of psychoactive substance use (alcohol, cannabis, heroin and nicotine) • Apply principles of management of harmful use, dependence, withdrawal and complications (Including pharmacological and psychosocial approaches related to alcohol, cannabis, nicotine and heroin). • Elaborate effective measures in harm reduction/ abstinence • List facilities and resources available in Sri Lanka to manage issues related to substance abuse.
Topic 10	**Deliberate Self-Harm (DSH) & suicide**
Aim	To develop the knowledge on the complexity of DSH and suicidal behavior, and to learn the basics of risk assessment and brief intervention.
Intended Learning Outcomes	• Outline the prevalence of DSH and suicide and its changing trends • List the risk factors for DSH and suicide • Demonstrate the ability to assess a patient presenting after DSH • Discuss principles of care of a patient presenting with DSH (identification of mental illness and treatment, proper referral, involvement of MDT when necessary, mobilizing support, psycho-education, assertiveness, problem solving counselling and coping) • Discuss strategies to reduce DSH and suicide
Topic 11	**Forensic Psychiatry**
Aim	To develop the understanding on the principles of forensic psychiatry
Intended Learning Outcomes	• Define basic knowledge on mental health act and common law which can be used in psychiatric emergencies • Discuss fundamental concepts in forensic psychiatry • Apply basic knowledge about circumstances of breaching of confidentiality in psychiatry • Demonstrate ability to familiarise with the concept of competence and capacity

Topic 12	**Liaison psychiatry**
Aim	The aim of this section is to enhance the knowledge on the body – mind connection and promote the ability of working across the disciplines.
Intended Learning Outcomes	• Explain the impact of psychiatric illnesses on morbidity and mortality of patients with physical illnesses. • Discuss psychiatric presentations of organic illnesses • Distinguish presentations of psychiatric illnesses in patients with physical illnesses • Apply pharmacological principles in prescribing in physically ill patients. • Discuss psychological consequences of long term and/or recurrent illnesses or physical disability. e.g.: malignancy, osteoarthritis, amputation of limb and disfigurement. • Apply principles of caring for the terminally ill patients. • Demonstrate ability to use knowledge of psychology of death and dying in clinical situations • Apply principles of communicating with other disciplines (writing a referral and verbal communication)
Topic 13	**Pharmacotherapy and Electro Convulsive Therapy (ECT)**
Aim	To develop the essentials and applications of drug therapy and ECT.
Intended Learning Outcomes	• Define basic principles of psychopharmacology • List classification of psychotropic drugs giving examples • Discuss pharmacokinetics and pharmacodynamics of TCAs, SSRIs, SNRIs, first generation antipsychotics (eg; haloperidol, trifluoperazine and fluphenazine decanoate), second generation antipsychotics (eg;risperidone, olanzapine, aripiprazole and clozapine), mood stabilizers (eg; lithium carbonate, sodium valproate and lamotrigine), benodiazepines (eg; clonazepam, chlordiazepoxide and lorazepam) • List main indications for ECT and associated side effects • Discuss preparation of a patient for ECT (educate patient and caregivers about ECT, side effects of ECT and obtaining informed written consent)
Topic 14	**Psychotherapy**
Aim	Understanding the basics and the applications of different psychotherapies.
Intended Learning Outcomes	• Apply principles of cognitive behaviour therapy and its indications • Apply principles of exposure and response prevention in treating OCD • Discuss principles of exposure therapy in phobias • Illustrate principles of supportive psychotherapy • Apply principles of relaxation techniques

	• Discuss principles of motivational interviewing for substance misuse • Apply principles of family involvement for all the major psychiatric disorders • Discuss principles of sex therapy
Topic 15	**Psychiatric services in Sri Lanka**
Aim	To develop a comprehensive understanding about the mental health services available in Sri Lanka.
Intended Learning Outcomes	• Define psychiatric services available in Sri Lanka • Discuss ability to do an appropriate referral to utilize these services • Distinguish alternative practices used in treatment of psychiatric disorders
Topic 16	**Community psychiatry**
Aim	The aim of this section is to provide the knowledge on the principles of community psychiatry and to expose them to different models of community care.
Intended Learning Outcomes	• List the institutions outside traditional healthcare system, which fulfil social needs of mentally ill (e.g. Divisional Secretariat and other social care services) and describe facilities and programmes provided by them. • Apply principles of and strategies to prevent mental ill-health in the community. (Describe and evaluate effective measures at community level to reduce use of alcohol, tobacco and other substances and suicide) • Discuss term promotion of mental health in the community • Explain impact of stigma and discrimination related to mental health and illness in the community. • Apply principles of rehabilitation of patients with severe disability in the community. • Demonstrate effective team functioning in the multidisciplinary care team in the community. • Discuss psychological and physical burden experienced by carers of patients with mental illnesses, and how to provide support for them. • Demonstrate awareness of current resources available for carers e.g. Carer support by Alzheimer's foundation.
Topic 17	**Emergencies in psychiatry**
Aim	To develop the knowledge and skills in managing psychiatric emergencies.
Intended Learning Outcomes	• Demonstrate ability to assess risk of suicide • Discuss the management of a patient with high risk of suicide • Demonstrate ability to assess risk of violence and homicide • Elaborate the management of an aggressive patient

	• Discuss de-escalation techniques • Demonstrate ability to identify lithium toxicity and describe its management • Show ability to identify neuroleptic malignant syndrome and describe its management • Demonstrate ability to identify serotonin syndrome and describe its management • Show ability to identify acute dystonia and describe its management • Discuss ability to identify the life-threatening side effects of clozapine and describe its management.
Topic 18	**Referral pathways to psychiatric services**
Aim	To develop the understanding and skills of making referrals.
Intended Learning Outcomes	• List the indications to refer a patient to a consultant psychiatrist • Discuss the process of referring a patient to the respective service

5.19.2. Detailed syllabus

The lectures are conducted during the clinical appointments in small groups

2	Lecture	Behavioural sciences and concepts in mental health
1	Lecture	Patient evaluation
1	Lecture	Risk assessment
2	Lecture	Communication skills and counselling skills
1	Lecture	Pharmacotherapy Electro Convulsive Therapy (ECT) and other physical therapies
2	Lecture	Psychotherapies
1	Lecture	Psychiatric services in Sri Lanka and Referral pathways to psychiatric services
Terms 5 to 11		
10	Lecture	General adult psychiatry
		Organic Psychiatry (1), Schizophrenia and related disorders (2), Affective disorders (2), Anxiety Disorders (2), Somatoform disorders (1), Stress and trauma (1), Personality disorders (1)
3	Lecture	Child and adolescent psychiatry
2	Lecture	Psychiatry of the elderly
2	Lecture	Sexual dysfunctions, disorders of sexual preferences and gender related issues
2	Lecture	Substance abuse, abuse of prescription medicine and related mental health problems
1	Lecture	Deliberate self-harm (DSH) & suicide
2	Lecture	Forensic Psychiatry
1	Lecture	Liaison psychiatry
1	Lecture	Community psychiatry
1	Lecture	Emergencies in psychiatry
Tutorials		
1	Tutorial	Schizophrenia
1	Tutorial	Depression
1	Tutorial	Anxiety disorders
1	Tutorial	Child psychiatry
1	Tutorial	Sexual dysfunctions and disorders
1	Tutorial	Substance abuse
1	Tutorial	DSH and suicidal behaviour
1	Tutorial	Forensic psychiatry
1	Tutorial	Liaison psychiatry
1	Tutorial	Psychiatric emergencies

Clinical Lecture Demonstrations

	Topics
02	Eliciting psychopathology
02	Recap of psycho pharmacology
02	Recognizing the side effects of psychotropic medications
02	Empathic understanding / communication
03	Basics of counselling
01	Revealing the diagnosis
02	Psycho education
02	Dealing with DSH and suicidal ideations
02	Problem solving and Anger management
02	Essentials of Cognitive Behaviour Therapy
02	Motivational interview
02	Use of relaxation techniques in clinical settings

5.19.3. Summary

	Term 5	Term 6	Term 7	Term 8	Term 9	Term 10	Final	Total
Lecture		10		10	1	05		35
Clinical*			96				384	480
CLD								24
Tutorials						10		10
Total								549

5.19.4. Evaluation

Type of Examination		Distribution of Marks- First examination	Distribution of Marks- subsequent examinations	Details of evaluation – No. of hrs No. of question etc.	Qualifying pass marks (%)
	End of the course				
1	Essay	25	25	6 questions-3hr	45%
2	Common MCQ	25	25	30 True/false 20 SBA questions	
3	Long Case	25	31.25	30 minutes with patient 15 minutes with examiner	50%
3	Mini Observed clinical examination	15	18.75	2 cases 8 minutes each	
4	Continuous assessment	10	-	Pre professorial OSCE 2.5% CA Final Year – 2.5% End of appointment Long case - 2.5 % End of appointment OSCE – 2.5%	
	Total	100	100		50%

5.19.5. References

1. Psychiatry by John Geddes, Jonathan Price , Rebecca McKnight. Oxford Medical Publications, 20122.Shorter Oxford Textbook of Psychiatry**. By** Philip Cowen , Paul Harrison, Tom Burns . 6th edition, Oxford: Oxford University Press, 2012

3. Handbook of Clinical Psychiatry by Varuni de Silva & Raveen Hanwella, Kumaran Book House, 2014

4. Companion to psychiatric studies**.** 8th edition, edited by Eve C.Johnstone, David Owens and Stephen Lawrie, Elsevier Health Sciences, 2010.

5. Introductory Text Book of Psychiatry**.** Nancy C Anderson & Donald W. Black. 6th edition, American Psychiatric publishing, 2014.

Synchronization Table for Phase II - Including Clinical Subjects

Term 5

Microbiology	Parasitology	CFM		Forensic Medicine	Pathology	Clinical Pharmacology & Therapeutic	Medicine	Paediatrics	Surgery	Psycology &	PPDS
		CFM	Sociology								
General microbiology (13hrs)		Demography 1 (05hrs)	Medical sociology (07hrs)	Introduction (04hrs)	General pathology (20hrs)	General principles of clinical Pharmacology (20hrs)		Growth & development (07hrs)	Introduction (03hrs)		Medical Ethics (02hrs)
Basic & applied immunology (13hrs)		Statistics -1 (03hrs)							Preoperative Management (02hrs)		Enhancing Communication Skills II (06hrs)
		Basic epidemiology (10hrs)							Postoperative management (02hrs)		Medical Professionalism I (04hrs)
		CBL (03hrs)							Postoperative complications (03hrs)		

Term 6

Microbiology	Parasitology	CFM		Forensic Medicine	Pathology	Clinical Pharmacology & Therapeutics	Medicine	Paediatrics	Surgery	Psycology & Psychiatry	PPDS
		CFM	**Sociology**								
Bacteriology (18hrs)	Malaria, Leishmaniasis, toxoplasmosis & Trichomoniasis Intestinal protozoa (35hrs)	Maternal and Child Health (08hrs)	Medical sociology (07hrs)	Medical law & ethics (5hrs)	Environmental disease (04hrs)	Immuno-pharmacology – (02hrs)		Nutrition (04hrs)	Surgical techniques /technology (03hrs)	General psychiatry (10 Hours)	PPDS (16hrs)
		Community Nutrition (06hrs)		Clinical Forensic Medicine (2hrs)	Neoplasia (14hrs)	Antimicrobials (14hrs)		Infection & Immunology (04hrs)	Management and legal issues (03hrs)		
		Environmental & Occupational Health (03hrs)							Surgical microbiology (04hrs)		
		CBL (03hrs)									

Term 7

Microbiology	Parasitology	CFM		Forensic Medicine	Pathology	Clinical Pharmacology & Therapeutics	Medicine	Paediatrics	Surgery	Psycology & Psychiatry	PPDS
		CFM	Sociology								
Bacteriology (04hrs)		Health Promotion (04hrs)	Medical sociology (06hrs)	Medical law & ethics (3hrs)	Clinical pathology (10hrs)	Antimicrobials (06hrs)	Intro (10)	Neonatology (08hrs)	Surgical Radiology (02hrs)	Clinical psychology - 16hr	PPDS (12hrs)
Mycology (08hrs)	Helmintholog y (20hrs)	Family Medicine (16hrs)		Clinical Forensic Medicine (2hrs)		Autonomic nervous system (05hrs)					
Virology (06hrs)		Field Visit (10hrs)		Forensic Pathology (06hrs)	Urinary system (16hrs)	Renal system (05hrs)		Renal system (04hrs)	Genito-Urinary System (05hrs)		
Clinical microbiology (08hrs)				Forensic Aspects of injuries (10hrs)	Male genital system (09hrs)				Critical care (01hr)		

Term 8

Microbiology	**Parasitology**	**CFM**	**Forensic Medicine**	**Pathology**	**Clinical Pharmacology & Therapeutics**	**Medicine**	**Paediatrics**	**Surgery**	**Psycology & Psychiatry**	**PPDS**
Virology (09hrs)	cestodes & Schistosomiasis (19hrs)	Health Information System (02hrs)	Medical law & ethics (3hrs)	Cardiovascular system (20hrs)	Drugs acting on cardiovascular system (09hrs)	Medicine (5)	Cardiovascular system (04hrs)	Vascular diseases (04hrs)	Adult and child Psych. (5hrs)	Enhancing Communication Skills III (06hrs)
Clinical microbiology (18hrs)	Ectoparasites (15hrs)	Health Economics (04hrs)	Clinical Forensic Medicine (2hrs)		Disorders of CVS (11hrs)			Paediatri Surgery (01hr)	Forensic psychiatry – 05hrs	Medical Professionalism II (02hrs)
Immunology		Basic Epidemiology 2 (06rs)	Forensic Pathology (06hrs)	Respiratory system (20hrs)	Drugs acting on respiratory system (03hrs)		Respiratory system (04hrs)	ENT Surgery (01hr)		
		Statistics 2 (06hrs)	Forensic Aspects of injuries (10hrs)		Disorders of respiratory system (06hrs)			Tissue Transplantation (01hr)		
		CBL (04hrs)								
		Field Visit (10hrs)								

Term 9

Microbiology	**Parasitology**	**CFM**	**Forensic Medicine**		**Clinical Pharmacology & Therapeutics**	**Medicine**	**Paediatrics**	**Surgery**	**Psycology & Psychiatry**	**PPDS**
Virology & clinical microbiology (24hrs)		Applied Epidemiology and Communicable Diseases (06hrs)	Medical law & ethics (3hrs)	Alimentary system (36hrs)	Drugs acting on Alimentary system – 04hrs	Med (6)	GIT & liver (04hrs)	Gastro Intestinal Tract (07hrs)	Com Psy (1hr)	Presentation (15hrs)
	Snakes (10hrs)	Non Communicable Disease Epidemiology (06hrs)	Clinical Forensic Medicine (2hrs)		Disorders of Alimentary system – 07hrs			Hepatobiliary system and pancreas (02hrs)		
	Parasitic zoonosis (01hr)	Statistics 3 (04hrs)	Forensic Pathology (06hrs)	Musculoskeletal system (10hrs)	Musculoskeletal system (06hrs)		Musculoskeletal system (02hrs)	Musculoskeletal disorders (07hrs)		
		CBL (04hrs)	Forensic Aspects of injuries (10hrs)	Skin (03hrs)						
		Field Visit (10hrs)	Forensic Toxicology (05hrs)							

Term 10

CFM	Forensic Medicine	Pathology	Clinical Pharmacology & Therapeutics	Medicine	Paediatrics	Surgery	Psycology & Psychiatry	PPDS
Maternal and Child Health 2(04hrs)	Medical law & ethics (3hrs)	Endocrine diseases (13hrs)	Drugs acting on endocrine system (10hrs)	Cli pha (5)	Endocrine (05hrs)	Endocrine System (02hrs)	Psy. Pharm (5hrs)	Lectures/ discussions – 08hrs
Environmental & Occupationa2 Health (06hrs)	Clinical Forensic Medicine (3hrs)		Disorders of endocrine system (08hrs)					
Health planning & Management (04 hrs)	Forensic Pathology (06hrs)	Female genital system (16hrs)				Breast (01hr)		
CBL (06hrs)	Forensic Aspects of injuries (10hrs)		Toxicology (02hrs)				Tutorial (10 Hrs**)**	
	Forensic Toxicology (05hrs)							

Term 11

CFM	Forensic Medicine	Pathology	Clinical Pharmacology & Therapeutics	Medicine	Paediatrics	Surgery	Psycology & Psychiatry	PPDS
Special topics (04hrs)	Forensic Pathology (06hrs)	Nervous system (07hrs)	Drugs acting on CNS (13hrs)	Sub Spe (12)		Head and Neck (02hrs)	Adult psychiatry – 15hrs	
CBL (15hrs)	Forensic Aspects of injuries (10hrs)		Disorders of CNS (10hrs)			Neurosurgery (02hrs)		
	Forensic Toxicology (06hrs)					Ophthalmology (01hr)		
		Lympho-reticular tissues & haematological disorders (32hrs)	Miscellaneous – haemopoietic agents, vitamins & minerals, topical preparations and anticancer drugs (06hrs)		Hematology/Oncology (02hrs)	Oncology (02hrs)		
					Prescribing in children (01hr)			

Hours Needed for Phase II

Hours needed for Phase II								
Subject	Term 5	Term 6	Term 7	Term 8	Term 9	Term 10	Term 11	**Total**
PPDS	12	16	12	8	-	-	-	**48**
Microbiology	13	18	26	27	24	-	-	**108**
Immunology	-	16	2	2	-	-	-	**20**
Parasitology	-	22	15	15	8	-	-	**60**
Community and Family medicine	20	90	90	94	90	26	19	**429**
EBRM	20	37	38	8	6	13	6	**128**
Forensic Medicine	-	42	34	47	39	-	-	**159**
Clinical Pharmacology & Therapeutics	20	16	16	31	17	20	30	**150**
Pathology	20	18	35	40	47	30	39	**229**
Psychiatry	-	10	-	10	1	-	5	**35**
Medicine	-	-	10	5	6	5	12	**38**
Obstetrics & Gynaecology	-	-	-	-	-	-	-	**-**
Paediatrics	7	6	12	8	11	-	3	**47**
Surgery	10	10	8	7	15	3	7	**60**
Total	**122**	**301**	**298**	**302**	**264**	**97**	**121**	**1511**

Total Hours of the Programme

The programme is very extensive and demanding. More clinical attachments are to be added as more sub-specialties like urology, nephrology, accident and trauma become established in the Jaffna Teaching Hospital. The duration is five years and there is very limited time for self-study and recreation. The following table gives total hours allocated for learning. Credits are calculated based on 15 hours of lectures and tutorials, 30 hours of practical, research, seminar and 45 hours of clinical learning as equivalent of one credit. The clinical hours are only calculated for regular learning hours. The clinical learning during on call duties, casualty nights and weekend have not been considered in the calculation of credits.

Subject	Hours	Credits
Introductory	48	2.0
English	50	3.0
IT	29	1.2
PPDS	114	7.6
Anatomy	491	24.5
Biochemistry	171	10.0
Physiology	277.5	15.2
Microbiology and Immunology	121	7.7
Parasitology	60	3.4
Community and Family Medicine	429	16.3
Forensic Medicine	168	10.3
Pathology	277	15
Clinical Pharmacology & Therapeutics	150	9.4
EBPRM	165	5.8
Psychiatry	549	15.1
Medicine	1215	30.4
Obstetrics & Gynaecology	600	14.4
Paediatrics	643	17.0
Surgery	1140	29.3
Elective	192	4.3
Grand total	**6889**	**242**

Chapter 6
Evaluation Procedures and Award of Degree

Each subject will be evaluated by the respective department of study. In-course assessments and end-of-course examination are held. Three end-of-course examinations are conducted: First Examination for Medical Degrees, Second Examination for Medical Degrees part I & II and Final Examination for Medical Degrees. The First two examinations are bar examinations. The students must pass all subjects to enter the next stage.

6.1. In-course assessment

Respective Departments will conduct in course assessment examinations during the course. Students must attend all in-course assessment examinations. If any student is absent at the in-course assessment for a valid reason, the department concerned may conduct another examination either in written or oral form. If students get absent for trivial reasons, they will be given zero mark for that examination. A portion of the final marks of the first attempt will be obtained from the in-course assessment marks.

6.2. End-of-course Examination

An examination is conducted at the end of each Phase. A second examination will be conducted 6 weeks after releasing the results of the first examination. Each subject will be examined separately. Integrated examinations could be evolved when integrated teaching is introduced in due course. Each examination will have many components such as MCQ, essay questions, practical, spot examination, viva and clinical examinations. The components may vary according to the nature of the subject. Attempts will be made to make the evaluation objective by giving structured questions for theory and converting conventional clinical and practical examinations into Objective Structured Clinical Examinations and Objective Structured Practical Examinations.

6.2.1. Eligibility to Sit for the First Examination for Medical Degrees

- The subjects are Anatomy, Biochemistry and Physiology.
- The student must have valid registration in the University.
- The student must have at least 80% attendance in practical and tutorial classes of all the subjects.

- The student must have completed the course in all subjects and should have obtained the signature of each Head of each Department in the student record book and the application form.

6.2.2. Eligibility to Sit for the Second Examination (I and II) for Medical Degrees

- The subjects for part I are Parasitology, Microbiology and Forensic Medicine will be held at the end of 9th term.
- Part II subjects are Community Medicine, , Pathology and Pharmacology will be held at the end of 11th term.
- The student must have valid registration in the University.

Eligibility to sit Part I of second examination

- The student must have at least 80% attendance in practical and tutorial classes of the three subjects.
- 100% attendance is needed in Forensic Medicine clerkship
- The student must have completed the course in the subjects and should have obtained the signature of each Head of each Department in the student record book and the application form.

Eligibility to sit Part II of second examination

- 100% attendance is needed for the clinical clerkship on Pathology and Community and family medicine.
- The student must have completed the course in the subjects and should have obtained the signature of each Head of each Department in the student record book and the application form.
- Completed the Evidence Based Research Module
- Passed all the components of PPDS

6.2.3. Eligibility to Sit for the Final Examination for Medical Degrees

- The subjects are Medicine, Obstetrics & gynaecology, Paediatrics, Psychiatry and Surgery.
- The student must have valid registration in the University.
- The student must have obtained pass marks in the assessment of the Elective Appointment.
- The student must have 100% attendance in clinical component. Up to 10% absenteeism in Clinical component could be acceptable with written permission of the Consultant. The student should have at least 80% attendance in other relevant components of all the subjects or the absence should have been excused by the Faculty and the Senate.
- The student must have completed the course in all the subjects and should have obtained the signature of each Head of each Department in the student record book and the application form.

6.2.4. Attempts and Excuses

The students must appear for the scheduled examinations. The examination scheduled immediately after the completion of the course shall be deemed to be the first attempt. Students will be allowed to sit 4 scheduled attempts at the first examination and 6 scheduled attempts at the other examinations. If any student misses the scheduled examination for not fulfilling the above mentioned criteria or for any other reason, the student will be deemed to have failed that examination unless the absence at the examination is excused by the Faculty and the Senate. If any student happens to be unable to appear at the examination due to ill health, the student should get examined by the UMO or a Consultant at the Teaching Hospital or a Government Medical Officer if the student is in a faraway place. The medical certificate should be duly certified by the UMO and submitted to the Faculty within Two weeks. Medical certificates or any appeal of excuses will not be accepted after releasing the results of the examination.

An additional grace chance may be granted under exceptional circumstances for students who have not completed any examination within the stipulated number of attempts if the appeal of the student is well supported by authenticated documents and accepted by the Faculty Board and approved by the Senate.

6.3. Summary of the Scheme of Evaluation

6.3.1. Summary of the Scheme of Evaluation at the First Attempt

Summary of the Scheme of Evaluation- First examination											
	Subject	**In Course**	**Theory**		**Practical/OSPE/ Spot 1**	**OSCE / Spot 2**	**Clinical**		**Research**	**Viva**	**Total**
			Essay	**MCQ**			**Short case**	**Long case**			
1	Anatomy	20	25	25	15	05				10	100
2	Biochemistry	30	25	25	10					10	100
3	Physiology	20	30	30	10					10	100
4	Forensic Medicine	20	40	20	10					10	100
5	Microbiology	20	35	35	10						100
6	Parasitology	15	40	20	15					10	100
7	Community & Family Medicine	50	20	20						10	100
8	Pathology	20	30	30	14	6					100
9	Pharmacology	20	25	25		20				10	100
10	EBRM	50							50		100
11	PPDS	50				50					100
12	Medicine	20	20	20		0	20	20			100
13	Obstetrics & Gynaecology	10	20	20		10	20 (Obs)	20 (Gynae)			100
14	Paediatrics	20	20	20			20	20			100
15	Surgery	15	20	20		05	20	20			100
16	Psychiatry	10	25	25			15	25			100

6.3.2. Summary of the Scheme of Evaluation at the Subsequent Attempts

Summary of the Scheme of Evaluation- First examination											
	Subject	**In Course**	**Theory**		**Practical/OSPE/ Spot 1**	**OSCE / Spot 2**	**Clinical**		**Research**	**Viva**	**Total**
			Essay	**MCQ**			**Short case**	**Long case**			
1	Anatomy		35	35	15	05				10	100
2	Biochemistry		40	40	10					10	100
3	Physiology		35	35	10					20	100
4	Forensic Medicine		40	20	20					20	100
5	Microbiology		40	40	20						100
6	Parasitology		45	20	20					15	100
7	Community & Family Medicine	50	20	20						10	100
8	Pathology		40	40	14	6					100
9	Pharmacology		35	35		20				10	100
10	EBRM	50							50		100
11	PPDS	50				50					100
12	Medicine		25	25			25	25			100
13	Obstetrics & Gynaecology		20	20		10	25 (Obs)	25 (Gynae)			100
14	Paediatrics		25	25			25	25			100
15	Surgery		25	25		10	20	20			100
16	Psychiatry		25	25			18.75	31.25			100

6.4. Award of Pass, Fail, Distinctions and Class

Each examination of the Phase I, II and III courses will be independent and the results of one examination will not have any influence on the results of the other examinations and the students will be awarded pass, class and distinctions for each examination separately.

6.4.1. Award of Pass in a Subject

- The students should obtain the marks of 50% or above and obtain the qualifying marks in the specified components to pass any subject.
- Qualifying mark is 45% in the theory component [MCQ and Essay] in each of the subjects. Qualifying mark for the clinical subjects is, 45% in theory [MCQ and Essay] and 50% in clinical component [short case and long case in Medicine, Surgery, Paediatrics and Psychiatry and Obstetric & Gynaecological cases in Obstetrics & Gynaecology].
- The Community and Family Medicine assessment has five components. Students must obtain more than 45% marks in each component to pass each component. They must also obtain a total of 50 marks to pass the subject. If the student fails to obtain 45% marks in a component (except for in-course assessments), the student is expected to sit for the component in the successive allowed attempt. If the student does not obtain total of 50 marks in the subject, after successfully passing all five components, they must sit for both the written and viva exam in the successive allowed attempt, in order to obtain 50 marks.

6.4.2. Award of Fail and Referred in an examination

- Any student who fails to appear at any scheduled examination will be deemed to have failed that examination unless an excuse is accepted by the Faculty Board and approved by the Senate.
- If any student obtains less than 25% in any one subject, the student will be failing the entire examination irrespective of the marks obtained in other subjects.
- If any student obtains less than 50% in all subjects, the student will have failed in the examination.
- If any student fails to obtain the qualifying marks, the student will fail in that subject irrespective of the total marks obtained.

- If the student passes one or more subjects and fails to pass in other subjects, the student will be deemed to have referred in the unsuccessful subjects.

6.4.3. Award of Pass and Class Honours

Pass will be awarded to students when they obtain pass marks in all subjects of the course. Class Honours will be awarded to students only if they complete the course in the first scheduled attempt and obtain average marks for that examination as follows:

Range of Marks	Award
50-59	Pass
60-64	Second Class Lower
65-69	Second Class Upper
70 or above	First Class

6.4.4. Award of Distinction

Distinctions in subjects will be awarded to students who got 70% or above in any subject if they have got pass marks in all subjects of the examination at the first scheduled attempt.

6.5. Releasing Results

When the marks of all subjects of an examination are received by the Dean, a Pre-Result Board will be convened by the Dean. The Pre-Result Board will comprise the relevant Heads of Departments, all examiners who took part in that examination and the Assistant Registrar.

In Phase II of the examination Part 1 and Part 2 results will be released separately indicating pass/fail. Class and distinction results of the whole phase II examination will be released at the end of Phase II.

The marks will be analysed and scrutinized and sent to the Examination branch of the University. The students who obtain fail in subjects will be notified by the Dean, subject to confirmation by the Result Board and the Senate. The date of notifying failures will be the first day for counting 6 weeks to conduct the second examination.

The Vice Chancellor will convene a Result Board to finalize the results and submit the result for confirmation by the Senate. The Result Board will scrutinize the marks again and work out the distinctions, class honours, passes, failures and prizes.

6.6. Award of Bachelor of Medical Science [BMSc] – SLQF level 6

The degree of BMSc will be awarded to those students who wish to leave the University after successful completion of the Second Examination for Medical Degrees.

The BMSc could be converted to MBBS provided the students return within a period of 5 years from the date of award of BMSc and complete the MBBS within the remaining period to make the maximum period of 10 years in the University.-