

**RYK Medical College**

**Department of Medical Education**



**Study Guide**

**Module 1: Foundation (Block 1)**

**Academic Year 2025-26**

**(8 Weeks)**

**Integrated and Modular**

**First Year M.B.B.S**

|  |  |
| --- | --- |
| **TABLE OF CONTENTS** | **PAGE #** |
| Title page | ------- |
| Table of contents | 01 |
| List of abbreviations | 02 |
| Curriculum frame work | 03 |
| Introduction to study guide | 04 |
| Introduction to module | 05 |
| Module committee | 06 |
| Teaching faculty/teaching methodologies/venue | 07 |
| Time table | 08-15 |
| Distribution and duration of teaching activities | 16 |
| The module rational, aims & implementation TOR | 17 |
| Module outcomes | 18 |
| Course content, codes & specific Learning objectives | 19-33 |
| Operational definitions | 34-35 |
| Assessment policy & table of specifications | 36-37 |
| Assessment schedule & OSPE/OSCE/VIVA scheme | 38 |
| Assessment tools & Sample questions | 39 |
| The books and recommended readings/ learning resources | 40 |

|  |  |  |  |
| --- | --- | --- | --- |
| LIST OF ABBREVIATIONS | | | |
| A | Anatomy | **HCL** | Hydrochloric acid |
| ABG | Arterial blood gas | **H&E** | Hematoxylin and eosin |
| Ag | Aging | **HL** | Hematopoietic and lymphatic |
| AKI | Acute kidney injury | **HMP** | Hexose monophosphate |
| ALT | Alanine transaminase | **HNSS** | Head & neck special senses |
| AMP | Adenosine Monophosphate | **ICF** | Intra cellular fluid |
| ANS | Autonomic nervous system | **IL** | Interleukin |
| AST | Aspartate transaminase | **IN** | Inflammation |
| AV | Atrioventricular | **INR** | International normalized ratio |
| B | Biochemistry | **IUD** | Intrauterine device |
| Bhs | Behavioral sciences | **IUGR** | Intra uterine growth restriction |
| C | Civics | **JVP** | Jugular venous pressure |
| CBC | Complete blood count | **LDH** | Lactate dehydrogenase |
| C-FRC | Clinical-Foundation Rotation Clerkship | **M** | Medicine |
| CK | Creatine kinase | **MALT** | Mucosa associated lymphoid tissue |
| CM | Community medicine | **MCH** | Mean corpuscular hematocrit |
| CNS | Central nervous system | **MCV** | Mean corpuscular volume |
| CO | Carbon monoxide | **MRI** | Magnetic resonance imaging |
| CO2 | Carbon dioxide | **MS** | Musculoskeletal |
| COPD | Chronic obstructive pulmonary disease | **MSD** | Musculoskeletal disorders |
| COX | Cyclooxygenase | **NEAA** | Non essential amino acids |
| CPR | Cardio pulmonary resuscitation | **NMJ** | Neuromuscular junction |
| CT | Computed tomography | **NS** | neurosciences |
| CV | Cardiovascular | **O** | Ophthalmology |
| CVA | Cerebral vascular accident | **Or** | Orientation |
| DALY | Disability adjusted life year | **P** | Physiology |
| DCMLS | Dorsal column medial lemniscus system | **Pa** | Pathology |
| DLC | Differential leukocyte count | **PAF** | Platelet activating factor |
| DNA | Deoxy ribonucleic acid | **PBL** | Problem based learning |
| ECF | Extra cellular fluid | **PCR** | Polymerase chain reaction |
| ECG | Electrocardiography | **PDGF** | Platelet derived growth factor |
| ECP | Emergency contraceptive pill | **Pe** | Pediatrics |
| EEG | Electroencephalogram | **PEM** | Protein energy malnutrition |
| EnR | Endocrinology and reproduction | **PERLs** | Professio Ethic Research Leadership |
| ENT | Ear Nose Throat | **PH** | Pharmacology |
| ER | Emergency room | **PNS** | Peripheral nervous system |
| F | Foundation | **Psy** | Psychiatry |
| FEV1 | Forced expiratory volume 1 | **PVC** | Premature ventricular contraction |
| FM | Forensic medicine | **QALY** | Quality adjusted life years |
| FVC | Forced vital capacity | **QI** | Quran & Islamiat |
| GFR | Glomerular filtration rate | **R** | Renal |
| GIT | Gastrointestinal tract | **Ra** | Radiology |
| GMP | Guanosine monophosphate | **RBCs** | Red blood cells |
| GO | Gynecology and obstetrics | **SA** | Sinoatrial |
| RDA | Recommended dietary allowance | **TCA** | Tricarboxylic acid cycle |
| Re | Respiratory | **TNA** | Tumor necrosis factor |
| RFLP | Restriction fragment length polymorphism | **USG** | Ultrasonography |
| RMP | Resting membrane potential | **UTI** | Urinary tract infection |
| RNA | Ribonucleic acid | **WBCs** | White blood cells |
| S | Surgery |  |  |

**CURRICULUM FRAMEWORK**

The University of Health Sciences (UHS) Lahore has designed a five year modular framework For integrated curriculum based on systems, clinical clerkships, Quran Pak and Professionalism.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Curriculum framework** | | | | | | |
| **Year 01** | **Modules** | **Block 1** | | | **Block 2** | **Block 3** |
| * Foundation -1 * Hematopoietic & Lymphatic | | | * Musculoskeletal and locomotion - 1 | * Cardiovascular - * Respiratory – 1 |
| PERLS-1, Quran-1, Islamiat & Civics, Pakistan Studies, English | | | | |
| C-FRC -1(Clinical-Foundation, Rotation, Clerkship) | | | | |
|  | | | | | | |
| **Year 02** | **Modules** | **Block 4** | | | **Block 5** | **Block 6** |
| * GIT & Nutrition–1 * Renal – 1 | | | * Endocrinology & Reproduction – 1 * Head & Neck, Special senses | * Neurosciences –1 * Inflammation - 1 |
| PERLS-2, Quran Pak-2, Islamiat, Civics & Pakistan Studies, English | | | | |
| C-FRC -2(Clinical-Foundation, Rotation, Clerkship) | | | | |
|  | | | | | | |
| **Year 03** | **Modules** | **Block 7** | | **Block 8** | | **Block 9** |
| * Foundation – 2 * Infectious Diseases * Neoplasia * Musculoskeletal & Locomotion - 2 | | * Hematopoietic, Immunity & Transplant * Cardiovascular - 2 | | * Respiratory – 2 * Forensic Medicine * Community Medicine & Family Health-1 |
| PERLS - 3, Quran Pak – 3 | | | | |
| C-FRC -3 (Clinical-Foundation, Rotation, Clerkship) | | | | |
|  |  |  | | | | |
| **Year 04** | **Modules** | **Block 10** | **Block 11** | | | **Block 12** |
| * Renal – 2 * Endocrinology & Reproduction – 2 * GIT & Nutrition – * Neurosciences - 2 | * Maternal & Child Health * Ophthalmology * Otorhinolaryngology | | | * Community Medicine & Family Health -2 * Psychiatry & Behavioral Sciences |
| PERLS – 4, Quran Pak – 4, Electives & BLS Workshops | | | | |
| C-FRC - 4 (Clinical-Foundation, Rotation, Clerkship) | | | | |
|  | | | | | | |
| **Year 05** | **Modules** | * Gynecology & Obstetrics * Pediatrics * Medicine & Allied * Surgery & Allied | | | | |
| C-FRC -5 (Clinical-Foundation, Rotation, Clerkship) | | | | |

**INTRODUCTION TO STUDY GUIDE**

**WHAT IS A STUDY GUIDE?**

This study guide is prepared for the students of 1st year MBBS admitted in RYKMC for session 2024-25 affiliated with University of Health Sciences Lahore (UHS). The learners (1st year MBBS students) will be able to:-

* Organize the learning program module for the session 2024-25.
* Manage their studies as per guidance provided throughout the module.
* Learn the assessment tools, rules & regulations governing the module.

**THE STUDY GUIDE:**

* Communicates information on organization and management of the module. This will help the student to contact the right person in case of any difficulty.
* Defines the objectives which are expected to be achieved at the end of the module.
* Identifies the learning strategies such as lectures, small group teachings, clinical skills, demonstration, tutorial and case based learning that will be implemented to achieve the module objectives.
* Provides a list of learning resources such as books, computer assisted learning programs, web- links, and journals for students to consult in order to maximize their learning.
* Highlights information on the contribution of continuous and Term examinations on the student’s overall performance.
* Includes information on the assessment methods that will be held to determine every student’s achievement of objectives.
* Focuses on information pertaining to examination policy, rules and regulations.

**MODULE INTRODUCTION**

**Module/ course Name:** Foundation (block 1, Module 1)

**Block duration:** Eleven weeks (foundation module + Hematology module)

**Module duration**: 08 weeks

**Year:** 1at

**Block:** 1

**Start Date:** -- of March 2025-26

**End Date:** -- of May 2025-26

**Departments** = Anatomy, Physiology, Biochemistry, pharmacology, pathology, community medicine, clinical skill foundation (hospital), medicine, surgery, gynecology & obstetrics, pediatrics, behavioral sciences, Holy Quran/Islamiat & Pakistan studies.

**Daily timings:** 8:00 AM to 4:00 PM

**No. of hours:** 8 hours per day (20 min tea break & 40 min prayer/lunch break)

**Teaching hours:** 07 per day/35 hours per week

**Class test:** ----- of June 2024-25 (02:00-04:00 Pm)

(Roll # 01-50 multipurpose hall, 51 -100 skill lab).

(All subjects MCQs only)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Subjects** | **TBL** | **PBL** | **CBL** | **SGD** | **Tutorial** | **Demo** |
| **Anatomy** | Mitosis & Meosis | × | Chromosomal anomalies | Menstrual cycle | × | × |
| **Physiology** | homeostasis | Cell cycle | WBC | Membrane channels | Organelles of cell | Blood groups  ABO/Rh |
| **Biochemistry** | Biochemical markers | Cell to cell signaling | Genetics | DNA | RNA | Transcription replication  elongation |
| **Pharmacology** | × | × | × | × | × | × |
| **Pathology** | × | × | × | × | × | × |
| **Com medicine** | × | × | × | × | × | × |
| **Behav sciences** | × | × | × | × | × | × |

**YEAR 1 & MODULE COMMITTEES**

**Year 1 committee**

* Prof Dr Tariq M Rehan (HOD DME) (Principal)
* Prof Dr Tehseen Iqbal (HOD Physiology) (Vice. Principal)
* Prof Dr Ghaffar Ansari (HOD Anatomy), Prof Dr Zia ur Rehman Alvi
* Prof Dr Dr Shafqat Nazeer (HOD Biochemistry)
* Prof Dr Abdul Hakeem (HOD Pathology)
* Prof Dr M Amir Rafique (HOD Pharmacology)
* Prof Dr Javed Akhter (HOD Community Medicine)
* Prof Dr M saleem (HOD Forensic medicine)

**Module committee**

* Dr Raja Faisal Zulfiqar (Anatomy)
* Dr Rahil Adil (Physiology)
* Dr khalida anwar (Biochemistry)
* Dr Naqeeb (Pathology)
* Dr Ali Hussain (community medicine)

**PBL, TBL & CBL Committee**

* Prof Dr Tariq M Rehan (HOD DME) (Principal)
* Prof Dr Tehseen Iqbal (HOD Physiology) (Vice. Principal)
* Prof Dr Ghaffar Ansari (HOD Anatomy), Prof Dr Zia ur Rehman Alvi
* Prof Dr Dr Shafqat Nazeer (HOD Biochemistry

**Mentoring committee**

* Prof Dr Abdul Hakeem (HOD Pathology)
* Prof Dr M Amir Rafique (HOD Pharmacology)
* Prof Dr Javed Akhter (HOD Community Medicine)
* Prof Dr M saleem (HOD Forensic medicine)

**Module coordinator:**

* Anatomy: Dr Raja Faisal Zulfiqar
* Biochemistry: Dr Dost M kalhoro
* Physiology: Dr Sadia Javiad
* Pharmacology: Dr Tesneem Yasmin
* Pathology: Dr Syed Naqeeb
* Community medicine: Dr Ali Hussain
* Medicine: Dr Abdul Waheed
* Surgery: Dr Jahangeer
* Pediatrics: Dr Masood
* Gynecology & obstetrics: Dr Farhat Yasmeen
* Behavioral sciences: Dr Mehwish Adnan

**Planning committee**

Department of medical education

**TEACHING FACULTY**

* Anatomy: Prof Dr Ghaffar Ansari, Prof Dr Zia ur Rehman Alvi, Dr Raja Faisal Zulfiqar
* Biochemistry: Prof Dr Shafqat Nazir, Dr Khalida Anwar, Dr Dost M kalhoro
* Physiology: Prof Dr Tehseen Iqbal, Dr Rahila Adil, Dr Sadia javaid
* Pharmacology: Dr M Amir Rafique
* Pathology: Prof Dr Abdul Hakeem, Dr Syed Naqeeb Ali
* Community Medicine: Dr Ali Hussain,
* Medicine: Dr Abdul waheed
* Surgery: Prof Dr Jahangir
* Pediatrics: Prof Dr Akhter Masood
* Gynecology & Obstetrics: Dr Farhat Yasmeen
* Behavioral Sciences: Dr Mahwish Adnan
* Holy Quran & Islamiyat: Mr Jaffar
* Pakistan studies: Mr Jaffar
* Civics: Dr Majid

**TEACHING METHODOLOGIES/STRATEGIES**

* Large group interactive sessions
* Tutorials
* Demonstrations
* Lab practical
* Simulations
* Team based learning
* Case based learning
* Problem based learning
* Small group discussions

**VENUE FOUNDATION MODULE**

|  |  |  |  |
| --- | --- | --- | --- |
| **GROUPING** | **LECTURES** | **PBL/CBL** | **SMALL GROUP DISCUSSION** |
| **Group A** (1-33)  **Group B** (34-66)  **Group C** 67-100) | Anatomy → LH - 05  Physiology → LH - 02  Biochemistry → LH - 01  Pathology → LH 04  Pharmacology → LH 03  Com medicine → LH 03  Rest of all → LH 01 | Anatomy → DR - 05  Physio → DR - 02  Biochem → DR - 01  Patho → DR 04  Pharma → DR 03  Com med → DR 06 | SGD room  2nd floor |
| **TEAM BASED LEARNING** |
| * Multi - purpose hall * Skill lab * Corresponding lab |
| **(PRACTICALS)** |
| Corresponding labs |

**WEEKLY TIME TABLES**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Week 1: Foundation = / /2024-25 to / /2024-25** | | | | | | | | |
| **Days** | **8:00 am**  **9:00 am** | **9:00 am**  **10:00 am** | **10:00**  **10:20 am** | **10:20 am**  **11:20 am** | **11:20 am**  **12:20 pm** | **12:20 pm**  **01:20 pm** | **01:20**  **02:00 pm** | **02:00 pm - 4:00 pm** |
| **Monday** | **LGIS**  **Holy Quran**  01  Dr A.Majid | **LGIS**  **Beh.sciences**  fbhs-001  Dr Mehwish.A | **Tea break** | **LGIS**  **Anatomy**  FA-001  **(GEN A)**  Dr G.Ansari | **LGIS**  **Physiology**  FP-001/A  Dr Tehseen.I | **LGIS**  **Biochemistry**  FB-001/A  Dr Shafqat | **Lunch and prayer break** | **Practical/Skill lab 1**  Group A **SKILL LAB – 1**  Group B **Physiology (P-1)**  Group C **Biochemistry (P-1)** |
| **Tuesday** | **LGIS**  **Pakistan studies**  01  Mr Jaffar | **LGIS**  **PERLS-1**  1-01  Dr M Tariq.K | **LGIS**  **Anatomy**  FA-002/A  **(GEN A)**  Dr Z.Alvi | **LGIS**  **Physiology**  FP-001/B  Dr Raheela.A | **LGIS**  **Biochemistry**  FB-001/B  Dr Dost.M | **Practical/Skill lab 1**  Group A **Biochemistry (P-1)**  Group B **Anatomy (P-1)**  Group C **SKILL LAB – 1** |
| **Wednesday** | **LGIS**  **Anatomy**  FA-002/B  **(GEN A)**  Dr R.Faisal | **LGIS**  **Com med**  FCM-001  Dr Ali.H | **LGIS**  **Anatomy**  FA-003  **(GEN A)**  Dr G.Ansari | **LGIS**  **Physiology**  FP-001/C  Dr Sadia.J | **LGIS**  **Biochemistry**  FB-001/C  Dr Khalida.A | **Practical/Skill lab 1**  Group A **Physiology (P-1)**  Group B **SKILL LAB – 1**  Group C **Anatomy (P-1)** |
| **Thursday** | **LGIS**  **Anatomy**  FA-004  **(GEN A)**  Dr Z.Alvi | **LGIS**  **Pathology**  fpa-001/A  Dr Hakeem.Ch | **LGIS**  **Anatomy**  FA-010A  **EMBRYOLOGY**  Dr R.Faisal | **LGIS**  **Physiology**  FP-001/D  Dr Safi.R | **LGIS**  **Biochemistry**  FB-002/A  Dr Shafqat | **Practical/Skill lab 1**  Group A **Anatomy (P-1)**  Group B **Physiology (P-1)**  Group C **Biochemistry (P-1)** |
| **Friday** | **Practical/Skill Lab 2**  Group A **SKILL LAB – 2**  Group B **Physiology (P-2)**  Group C **Biochemistry (P-2)** | | **LGIS**  **Anatomy**  FA-010B  **EMBRYOLOGY**  Dr G.Ansari | **LGIS**  **Physiology**  FP-001/E  Dr Tehseen.I | **LGIS**  **Biochemistry**  FB-002/B  Dr Dost.M | **CLINICAL SKILL FOUNDATION – 1**  (Please refer to clinical skill manual for group/ward distribution) |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Week 2: Foundation = / /2024-25 to / /2024-25** | | | | | | | | | | |
| **Days** | **8:00 am**  **9:00 am** | | **9:00 am**  **10:00 am** | **10:00**  **10:20 am** | **10:20 am**  **11:20 am** | | **11:20 am**  **12:20 pm** | **12:20 pm**  **01:20 pm** | **01:20**  **02:00 pm** | **02:00 pm - 4:00 pm** |
| **Monday** | **Practical/Skill Lab 2**  Group A **Physiology (P-2)**  Group B **SKILL LAB – 2**  Group C **Anatomy (P-2)** | | | **Tea Break** | **LGIS**  **Anatomy**  FA-010/C  **EMBRYOLOGY**  Dr Z.Alvi | | **LGIS**  **Physiology**  FP-001/F  Dr Raheela.A | **LGIS**  **Biochemistry**  FB-002/C  Dr Khalida.A | **Lunch and prayer break** | **Practical/Skill Lab 2**  Group A **Biochemistry (P-2)**  Group B **Anatomy (P-2)**  Group C **SKILL LAB – 2** |
| **Tuesday** | **Practical/Skill Lab 2**  Group A **Anatomy (P-2)**  Group B **Physiology (P-2)**  Group C **Biochemistry (P-2)** | | | **TBL**  **Anatomy (H)** FA-044 | | **LGIS**  **Physiology**  FP-001/G  Dr Sadia.J | **LGIS**  **Biochemistry**  FB-003/A  Dr Shafqat | **CLINICAL SKILL FOUNDATION 2**  (Please refer to clinical skill manual for group/ward distribution) |
| **1-25=DR 4** | **26-50=DR 3** |
| **51-75=DR 6** | **76-100=DR5** |
| **Wednesday** | **LGIS**  **Pharmacology**  FPh-001/A  Dr Zameer.AS | **LGIS**  **Com Med**  FCM-002/A  Dr Ali.H | | **LGIS**  **Anatomy**  FA-045/A  **HISTOLOGY**  Dr G.Ansari | | **LGIS**  **Physiology**  FP-001/H  Dr Safi.R | **LGIS**  **Biochemistry**  FB-003/B  Dr Dost.M | **Practical/ Skill Lab 3**  Group A **SKILL LAB – 3**  Group B **Physiology (P-3)**  Group C **Biochemistry (P-3)** |
| **Thursday** | **LGIS**  **PERLs**  1-02  Dr M Tariq.K | **LGIS**  **Pathology**  FPa-001/B  Dr Hakeem.Ch | | **LGIS**  **Anatomy**  FA-045B  **HISTOLOGY**  Dr Z.Alvi | | **LGIS**  **Physiology**  FP-001/I  Dr Tehseen.I | **LGIS**  **Biochemistry**  FB-003/C  Dr Khalida.A | **Practical/ Skill Lab 3**  Group A **Biochemistry (P-3)**  Group B **Anatomy (P-3)**  Group C **SKILL LAB – 3** |
| **Friday** | **LGIS**  **Beh sciences**  FBhS-002  Dr Mehwish.A | **LGIS**  **Pathology**  FPa-001/C  Dr Hakeem.Ch | | **LGIS**  **Anatomy**  FA-05/A  **(GEN A)**  Dr R.Faisal | | **LGIS**  **Physiology**  FP-001/J  Dr Raheela.A | **LGIS**  **Biochemistry**  FB-004/A  Dr Shafqat | **Practical/ Skill Lab 3**  Group A **Physiology (P-3)**  Group B **SKILL LAB – 3**  Group C **Anatomy (P-3)** |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Week 3: Foundation = / /2024-25 to / /2024-25** | | | | | | | | |
| **Days** | **8:00 am**  **9:00 am** | **9:00 am**  **10:00 am** | **10:00**  **10:20 am** | **10:20 am**  **11:20 am** | **11:20 am**  **12:20 pm** | **12:20 pm**  **01:20 pm** | **01:20**  **02:00 pm** | **02:00 pm - 4:00 pm** |
| **Monday** | **LGIS**  **Civics**  01  Dr A.Majid | **LGIS**  **Beh sciences**  FBhS-003  Dr Mehwish.A | **Tea Break** | **LGIS**  **Anatomy**  FA-005/B  **(GEN A)**  Dr G.Ansari | **LGIS**  **Physiology**  FP-002/A  Dr Sadia.J | **LGIS**  **Biochemistry**  FB-004/B  Dr Dost.M | **Prayer & Lunch break** | **Practical/ Skill Lab 3**  Group A **Anatomy (P-3)**  Group B **Biochemistry (P-3)**  Group C **Physiology (P-3)** |
| **Tuesday** | **LGIS**  **Anatomy**  FA-006/A  **(GEN A)**  Dr Z.Alvi | **LGIS**  **PERLs**  1-03  Dr M Tariq.K | **LGIS**  **Anatomy**  FA-006/B  **(GEN A)**  Dr R.Faisal | **LGIS**  **Physiology**  FP-002/B  Dr Safi.R | **LGIS**  **Biochemistry**  FB-004/C  Dr Khalida.A | **CLINICAL SKILL FOUNDATION – 3**  (Please refer to clinical skill manual for group/ward distribution) |
| **Wednesday** | **LGIS**  **Beh sciences**  FBhS-004  Dr Mehwish.A | **LGIS**  **Com med**  FCM-002/B  Dr Ali.H | **LGIS**  **Anatomy**  FA-011  **EMBRYOLOGY**  Dr G.Ansari | **LGIS**  **Physiology**  FP-002/C  Dr Tehseen.I | **LGIS**  **Biochemistry**  FB-005/A  Dr Shafqat | **Practical/Skill Lab 4**  Group A **SKILL LAB – 4**  Group B **Physiology (P-4)**  Group C **Biochemistry (P-4)** |
| **Thursday** | **LGIS**  **Pharmacology**  FPh-001-B  Dr Zameer.AS | **LGIS**  **Pathology**  FPa-001/D  Dr Hakeem.Ch | **LGIS**  **Anatomy**  FA-011-014  **EMBRYOLOGY**  Dr Z.Alvi | **LGIS**  **Physiology**  FP-002/D  Dr Raheela.A | **LGIS**  **Biochemistry**  FB-005/B  Dr Dost.M | **Practical/Skill Lab 4**  Group A **Biochemistry (P-4)**  Group B **Anatomy (P-4)**  Group C **SKILL LAB – 4** |
| **Friday** | **Practical/Skill Lab 4**  Group A **Anatomy (P-4)**  Group B **Biochemistry (P-4)**  Group C **Physiology (P-4)** | | **LGIS**  **Anatomy**  FA-015-016  **EMBRYOLOGY**  Dr R.Faisal | **LGIS**  **Physiology**  FP-003/A  Dr Sadia.J | **LGIS**  **Biochemistry**  FB-005/C  Dr Khalida.A | **Practical/Skill Lab 4**  Group A **Physiology (P-4)**  Group B **SKILL LAB – 4**  Group C **Anatomy (P-4)** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Week 4: Foundation = / /2024-25 to / /2024-25** | | | | | | | | | | |
| **Days** | **8:00 am**  **9:00 am** | | **9:00 am**  **10:00 am** | **10:00**  **10:20 am** | **10:20 am**  **11:20 am** | | **11:20 am**  **12:20 pm** | **12:20 pm**  **01:20 pm** | **01:20**  **02:00 pm** | **02:00 pm - 4:00 pm** |
| **Monday** | **Practical/Skill Lab 5**  Group A **SKILL LAB – 5**  Group B **Physiology (P-5)**  Group C **Biochemistry (P-5)** | | | **Tea Break** | **LGIS**  **Anatomy**  FA-017-018  **EMBRYOLOGY**  Dr G.Ansari | | **LGIS**  **Physiology**  FP-003/B  Dr Safi.R | **LGIS**  **Biochemistry**  FB-006/A  Dr Shafqat | **Prayer & Lunch break** | **CLINICAL SKILL FOUNDATION – 4**  **(Please refer to clinical skill manual for group/ward distribution)** |
| **Tuesday** | **Practical/Skill Lab 5**  Group A **Biochemistry (P-5)**  Group B **Anatomy (P-5)**  Group C **SKILL LAB – 5** | | | **LGIS**  **Anatomy**  FA-046  **HISTOLOGY**  Dr Z.Alvi | | **LGIS**  **Physiology**  FP-003/C  Dr Tehseen.I | **LGIS**  **Biochemistry**  FB-006/B  Dr Dost.M | **Practical/Skill Lab 5**  Group A **Physiology (P-5)**  Group B **SKILL LAB – 5**  Group C **Anatomy (P-5)** |
| **Wednesday** | **LGIS**  **Aging**  Fag-001  Dr A Yar.M | **LGIS**  **Com med**  FCM-003  Dr Ali.H | | **CBL**-**Anatomy (E)**  FA-019-20 | | **LGIS**  **Physiology**  FP-003/D  Dr Raheela.A | **LGIS**  **Biochemistry**  FB-006/C  Dr Khalida.A | **Practical/Skill Lab 5**  Group A **Anatomy (P-5)**  Group B **Biochemistry (P-5)**  Group C **Physiology (P-5)** |
| **1-25=DR 4** | **26-50=DR 3** |
| **51-75=DR 6** | **76-100=DR5** |
| **Thursday** | **LGIS**  **Anatomy**  FA-46 A&B  **HISTOLOGY**  Dr G.Ansari | **LGIS**  **Pathology**  FPa-002/A  Dr Hakeem.Ch | | **LGIS**  **Anatomy**  FA-047/A  **HISTOLOGY**  Dr Z.Alvi | | **LGIS**  **Physiology**  FP-003/E  Dr Sadia.J | **LGIS**  **Biochemistry**  FB-007/A  Dr Shafqat | **Practical 6**  Group A **Anatomy (P-6)**  Group B **Biochemistry (P-6)**  Group C **Physiology (P-6)** |
| **Friday** | **CLASS TEST**  **Combine** | **LGIS**  **Pathology**  FPa-002/B  Dr Hakeem.Ch | | **LGIS**  **Anatomy**  FA-021/A  **EMBRYOLOGY**  Dr R.Faisal | | **LGIS**  **Physiology**  FP-003/F  Dr Safi.R | **LGIS**  **Biochemistry**  FB-007/B  Dr Dost.M | **CLINICAL SKILL FOUNDATION - 5**  (Please refer to clinical skill manual for group/ward distribution) |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Week 5: Foundation = / /2024-25 to / /2024-25** | | | | | | | | |
| **Days** | **8:00 am**  **9:00 am** | **9:00 am**  **10:00 am** | **10:00**  **10:20 am** | **10:20 am**  **11:20 am** | **11:20 am**  **12:20 pm** | **12:20 pm**  **01:20 pm** | **01:20**  **02:00 pm** | **02:00 pm - 4:00 pm** |
| **Monday** | **LGIS**  **Civics**  02  Dr A.Majid | **LGIS**  **Beh sciences**  FBhS-005/A  Dr Mehwish.A | **Tea break** | **LGIS**  **Anatomy**  FA-007  **(GEN A)**  Dr G.Ansari | **LGIS**  **Physiology**  FP-004/A  Dr Tehseen.I | **LGIS**  **Biochemistry**  FB-007/C  Dr Khalida.A | **Prayer & Lunch break** | **Practical 6**  Group A **Biochemistry (P-6)**  Group B **Anatomy (P-6)**  Group C **Physiology (P-6)** |
| **Tuesday** | **LGIS**  **Anatomy**  FA-047/B  **HISTOLOGY**  Dr Z.Alvi | **LGIS**  **PERLs**  1-04  Dr M Tariq.K | **LGIS**  **Anatomy**  FA-048&48A  **HISTOLOGY**  Dr R.Faisal | **LGIS**  **Physiology**  FP-004/B  Dr Raheela.A | **LGIS**  **Biochemistry**  FB-008/A  Dr Shafqat | **Practical 6**  Group A **Physiology (P-6)**  Group B **Biochemistry (P-6)**  Group C **Anatomy (P-6)** |
| **Wednesday** | **LGIS**  **Anatomy**  FA-048 B&C  **HISTOLGOY**  Dr G.Ansari | **LGIS**  **Com med**  FCM-004/A  Dr Ali.H | **LGIS**  **Anatomy**  FA-021/B  **EMBRYOLOGY**  Dr Z.Alvi | **LGIS**  **Physiology**  FP-004/C  Dr Sadia.J | **LGIS**  **Biochemistry**  FB-008/B  Dr Dost.M | **Practical/Tuto 7**  Group A **Anatomy (P-7)**  Group B **physiology**-Tutorial  Group C **Biochemistry**-Tutorial |
| **Thursday** | **LGIS**  **Pharmacology**  FPh-002  Dr Zameer.AS | **LGIS**  **Pathology**  FPa-002/C  Dr Hakeem.Ch | **LGIS**  **Anatomy**  FA-022-023  **EMBRYOLOGY**  Dr R.Faisal | **LGIS**  **Physiology**  FP-004/D  Dr Safi.R | **LGIS**  **Biochemistry**  FB-008/C  Dr Khalida.A | **Practical/Tuto 7**  Group A **Biochemistry**-Tutorial  Group B **Anatomy (P-7)**  Group C **Physiology**-Tutorial |
| **Friday** | **Practical/Tuto 7**  Group A **Physiology**-Tutorial  Group B **Biochemistry**-Tutotorial  Group C **Anatomy (P-7)** | | **LGIS**  **Anatomy**  FA-024-025  **EMBRYOLOGY**  Dr G.Ansari | **LGIS**  **Physiology**  FP-005/A  Dr Tehseen.I | **LGIS**  **Biochemistry**  FB-009/A  Dr Shafqat | **Self Directed Learning** |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Week 6: Foundation = / /2024-25 to / /2024-25** | | | | | | | | |
| **Days** | **8:00 am**  **9:00 am** | **9:00 am**  **10:00 am** | **10:00**  **10:20 am** | **10:20 am**  **11:20 am** | **11:20 am**  **12:20 pm** | **12:20 pm**  **01:20 pm** | **01:20**  **02:00 pm** | **02:00 pm - 4:00 pm** |
| **Monday** | **Practical/TBL 8**  Group A **Biochemistry**-TBL  Group B **Anatomy (P-8)**  Group C **Physiology**- TBL | | **Tea break** | **LGIS**  **Anatomy**  FA-026  **EMBRYOLOGY**  Dr Z.Alvi | **LGIS**  **Physiology**  FP-005/B  Dr Raheela.A | **LGIS**  **Biochemistry**  FB-009/B  Dr Dost.M | **Prayer & Lunch break** | **Practical/TBL 8**  Group A **Anatomy (P-8)**  Group B **Physiology**- TBL  Group C **Biochemistry**-TBL |
| **Tuesday** | **LGIS**  **Beh sciences**  FBhS-005/B  Dr Mehwish.A | **LGIS**  **Com med**  FCM-004/B  Dr Ali.H | **LGIS**  **Anatomy**  FA-027-028  **EMBRYOLOGY**  Dr R.Faisal | **LGIS**  **Physiology**  FP-005/C  Dr Sadia.J | **LGIS**  **Biochemistry**  FB-009/C  Dr Khalida.A | **Practical/TBL 8**  Group A **Physiology**- TBL  Group B **Biochemistry**-TBL  Group C **Anatomy (P-8)** |
| **Wednesday** | **LGIS**  **Anatomy**  FA-008/A  **(GEN A)**  Dr Z.Alvi | **LGIS**  **Pathology**  FPa-002/D  Dr Hakeem.Ch | **LGIS**  **Anatomy**  FA-049/A  **HISTOLOGY**  Dr G.Ansari | **LGIS**  **Physiology**  FP-005/D  Dr Safi.R | **LGIS**  **Biochemistry**  FB-010/A  Dr Shafqat | **Practical/CBL 9**  Group A **Anatomy (P-9)**  Group B **Physiology**-CBL  Group C **Biochemistry**-CBL |
| **Thursday** | **ENGLISH**  **E - 1** | **LGIS**  **Pathology**  FPa-003/A  Dr Hakeem.Ch | **LGIS**  **Anatomy**  FA-029  **EMBRYOLOGY**  Dr R.Faisal | **LGIS**  **Physiology**  FP-005/E  Dr Tehseen.I | **LGIS**  **Biochemistry**  FB-010/B  Dr Dost.M | **Practical/CBL 9**  Group A **Biochemistry**-CBL  Group B **Anatomy (P-9)**  Group C **Physiology**-CBL |
| **Friday** | **LGIS**  **Anatomy**  FA-008/B  **(GEN A)**  Dr Z.Alvi | **LGIS**  **Beh sciences**  FBhS-006/B  Dr Mehwish.A | **LGIS**  **Anatomy**  FA-030  **EMBRYOLOGY**  Dr G.Ansari | **LGIS**  **Physiology**  FP-005/F  Dr Raheela.A | **LGIS**  **Biochemistry**  FB-010/C  Dr Khalida.A | **Self Directed Learning** |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Week 7: Foundation = / /2024-25 to / /2024-25** | | | | | | | | |
| **Days** | **8:00 am**  **9:00 am** | **9:00 am**  **10:00 am** | **10:00**  **10:20 am** | **10:20 am**  **11:20 am** | **11:20 am**  **12:20 pm** | **12:20 pm**  **01:20 pm** | **01:20**  **02:00 pm** | **02:00 pm - 4:00 pm** |
| **Monday** | **LGIS**  **Anatomy**  FA-008/C  **(GEN A)**  Dr G.Ansari | **LGIS**  **Holy Quran**  02  Dr A.Majid | **Tea break** | **LGIS**  **Anatomy**  FA-031-034  **EMBRYOLOGY**  Dr R.Faisal | **LGIS**  **Physiology**  FP-005/G  Dr Sadia.J | **LGIS**  **Biochemistry**  FB-011/A  Dr Shafqat | **Prayer & Lunch break** | **Practical/CBL 9**  Group A **Physiology**-CBL  Group B **Biochemistry**-CBL  Group C **Anatomy (P-9)** |
| **Tuesday** | **LGIS**  **Pharmacology**  FPh-003  Dr Zameer.AS | **LGIS**  **Com med**  FCM-005B  Dr Ali.H | **LGIS**  **Anatomy**  FA-032-033  **EMBRYOLOGY**  Dr Z.Alvi | **LGIS**  **Physiology**  FP-005/H  Dr Safi.R | **LGIS**  **Biochemistry**  FB-011/B  Dr Dost.M | **Practical/PBL 10**  Group A **Anatomy (P-10)**  Group B **Physiology**-PBL  Group C **Biochemistry**-PBL |
| **Wednesday** | **LGIS**  **Anatomy**  FA-049/B  **HISTOLOGY**  Dr G.Ansari | **LGIS**  **Pathology**  FPa-003/B  Dr Hakeem.Ch | **LGIS**  **Anatomy**  FA-035-036  **EMBRYOLOGY**  Dr R.Faisal | **LGIS**  **Physiology**  FP-005/I  Dr Tehseen.I | **LGIS**  **Biochemistry**  FB-011/C  Dr Khalida.A | **Practical/PBL 10**  Group A **Biochemistry**-PBL  Group B **Anatomy (P-10)**  Group C **Physiology**-PBL |
| **Thursday** | **LGIS**  **Islamiat**  (01)  Miss Kanwal | **LGIS**  **Anatomy**  FA-037  **EMBRYOLOGY**  Dr Z.Alvi | **ENGLISH**  **E - 2** | **LGIS**  **Physiology**  FP-006/A  Dr Raheela.A | **LGIS**  **Biochemistry**  FB-011/D  Dr Shafqat | **Practical/PBL 10**  Group A **Physiology**-PBL  Group B **Biochemistry**-PBL  Group C **Anatomy (P-10)** |
| **Friday** | **Practical/SGD 11**  Group A **Anatomy (P-11)**  Group B **Physiology**-SGD  Group C **Biochemistry**-SGD | | **LGIS**  **Anatomy**  FA-037A  **EMBRYOLOGY**  Dr R.Faisal | **LGIS**  **Physiology**  FP-006/B  Dr Sadia.J | **LGIS**  **Biochemistry**  FB-012/A  Dr Dost.M | **Self Directed Learning** |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Week 8: Foundation = / /2024-25 to / /2024-25** | | | | | | | | | | | |
| **Days** | **8:00 am**  **9:00 am** | **9:00 am**  **10:00 am** | | **10:00**  **10:20 am** | **10:20 am**  **11:20 am** | | **11:20 am**  **12:20 pm** | **12:20 pm**  **01:20 pm** | **01:20**  **02:00 pm** | **02:00 pm - 4:00 pm** | |
| **Monday** | **Practical/SGD 11**  Group A **Biochemistry**-SGD  Group B **Anatomy (P-11)**  Group C **Physiology**-SGD | | | **Tea break** | **LGIS**  **Anatomy**  (FA-038)  **EMBRYOLOGY**  Dr G.Ansari | | **LGIS**  **Physiology**  (FP-007/A)  Dr Safi.R | **LGIS**  **Biochemistry**  (FB-012/B)  Dr Khalida.A | **Prayer & Lunch break** | **Practical/SGD 11**  Group A **Physiology** SGD  Group B **Biochemistry** SGD  Group C **Anatomy (P-11)** | |
| **Tuesday** | **Practical/Demo 12**  Group A **Anatomy (P-12)**  Group B **Physiology** demo  Group C **Biochemistry** demo | | | **LGIS**  **Anatomy**  (FA-009)  **(GEN A)**  Dr Z.Alvi | | **LGIS**  **Physiology**  (FP-007/B)  Dr Tehseen.I | **LGIS**  **Biochemistry**  (FB-013/A)  Dr Shafqat | **Practical/Demo 12**  Group A **Biochemistry** demo  Group B **Anatomy (P-12)**  Group C **Physiology** demo | |
| **Wednesday** | **LGIS**  **Beh sciences**  (FBhS-006/B)  Dr Mehwish.A | | **LGIS**  **Com med**  (FCM-005/B)  Dr Ali.H | **LGIS**  **Anatomy**  (FA-039)  **EMBRYOLOGY**  Dr R.Faisal | | **LGIS**  **Physiology**  (FP-007/C)  Dr Raheela.A | **LGIS**  **Biochemistry**  (FB-013/B)  Dr Dost.M | **Practical/Demo 12**  Group A **Physiology**-Demo  Group B **Biochemistry**-demo  Group C **Anatomy (P-12)** | |
| **Thursday** | **LGIS**  **Anatomy**  (FA-049/C)  **HISTOLOGY**  Dr G.Ansari | | **LGIS**  **Pathology**  (FPa-003/C)  Dr Hakeem.Ch | **LGIS**  **Anatomy**  (FA-040-041)  **EMBRYOLOGY**  Dr Z.Alvi | | **LGIS**  **Physiology**  (FP-007/D)  Dr Sadia.J | **LGIS**  **Biochemistry**  (FB-014/A)  Dr Khalida.A | **LGIS**  **PERLs**  1-05  Dr M Tariq.K | **ENGLISH**  **E – 3** |
| **Friday** | **ENGLISH**  **E-4** | | **LGIS**  **Pathology**  (FPa-003/D)  Dr Hakeem.Ch | **SGD**-**Anatomy(E)**  (FA-042-043) | | **LGIS**  **Physiology**  (FP-007/E)  Dr Safi.R | **LGIS**  **Biochemistry**  (FB-014/B)  Dr Shafqat | **Self Directed Learning** | |
| **1-25=DR 4** | **26-50=DR 3** |
| **51-75=DR 6** | **76-100=DR5** |

**DISTRIBUTION AND DURATION OF TEACHING ACTIVITIES**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Subject | Hours theory | Hours  practical | SGD/TBL  PBL/CBL | Total hours |
| Anatomy | 48 | 12 practical = 24 hours | 03 | **75** |
| Physiology | 40 | 6 Practical = 12 hours | 12 | **64** |
| Biochemistry | 40 | 6 Practical = 12 hours | 12 | **64** |
| Pharmacology | 04 | ------- | ------- | **04** |
| Pathology | 12 | ------- | ------- | **12** |
| Community Medicine | 08 | ------- | ------- | **08** |
| Aging | 01 | ------- | ------- | **01** |
| Behavioral Sciences | 08 | ------- | ------- | **08** |
| PERLs | 05 | ------- | ------- | **05** |
| Clinical skill Foundation (CSF) | ------- | 10 | ------- | **10** |
| Skill lab | ------- | 10 | ------- | **10** |
| Holy Quran | 02 | ------- | ------- | **02** |
| Islamiat | 01 | ------- | ------- | **01** |
| Pakistan studies | 01 | ------- | ------- | **01** |
| Civics | 02 | ------- | ------- | **02** |
| English 1 | 04 | ------- | ------- | **04** |
| Self directed learning | 08 | ------- | ------- | **08** |
| Class test combine | 01 | ------- | ------- | **01** |
| Total | **7 hours/day = 35 hours/week × 8 = 280 hours** | | | **280** |

**MODULE RATIONALE**

Tomorrow’s Doctor is required to acquire competencies, which could align his knowledge base and skill set for his professional practices, the foundation knowledge needs to commence from “the cell”.

The cell is a structural and functional unit of life and has a role in normal homeostasis ensuring appropriate cellular functions; hence, this module has been designed to introduce a blend of molecular, genetic, anatomical, physiological, and psychosocial information essential for developing a perspective on the function of the human body in health and disease. Besides, an initial orientation to pharmacology, pathology, community medicine, behavioral sciences and clinical skill foundation subjects has been provided, so students are able to use this information in the coming modules,

**Aims:**

The aims of the first block are to develop:

* The key concepts in basic sciences.
* Skills in application of theories & rules to solve the problems.
* Skills using multiple sources.
* Habit of mind as medical student.
* An attitude of medical student

**IMPLEMENTATION TORs**

The time calculation for completion of modules and blocks is based on 35 hours per week. Total hours of teaching, learning and formative/summative internal assessment to be completed in a year are 1260.

The hours mentioned within each module are the mandatory minimum required. The rest of the hours are left to the discretion of the institution that can be used in teaching, learning and assessment as per decision of the institutional academic council. The content and the intended learning outcomes written are mandatory, to be taught, at the level required, as the end year assessment will be based on these. However, the level of cognition can be kept at a higher level by the institution. The Table of Specifications provided will be used for the three papers of the first professional examination. The same table of specifications should be used for the three block exams for internal assessment.

**MODULE OUTCOMES**

1. Describe the microscopic features of nerve cells, muscle cells, general features of epithelia of the body.

2. Describe the functional characteristics of various components of cell membrane and organelles of cell.

3. Differentiate between the dynamics of various transport mechanisms along the cell membrane.

4. Compare the functional differences between RBCs, WBCs and blood groups.

5. Explain the significance of homeostatic mechanisms in keeping body's internal environment nearly constant.

6. Describe the formation and functions of autonomic nervous system.

7. Correlate the structural design of each organ to its function.

8. Describe the different fascial planes in the different regions of the body & their surgical importance.

9. Demonstrate anatomical terms of position to describe the different body structures.

10. Describe the movements of body using proper anatomical terms of movement.

11. Describe and demonstrate the various bony landmarks.

12. Describe the types of joints and correlate them to the mechanisms of movement.

13. Classify the bone, joints and muscles based on the structure, function, phylogenetic origin.

14. Describe the structures associated with muscles and explain their functional correlations.

15. Classify and describe the cardiovascular system and correlate it functionally.

16. Explain the anatomical basis for radiological, cross-sectional, and surface anatomy.

17. Correlate clinic-pathologically the apoptosis in health & diseases.

**COURSE CONTENTS, CODES & SPECIFIC LEARNING OBJECTIVE**

|  |  |
| --- | --- |
| **ANATOMY** | |
| **CODE** | **SPECIFIC LEARNING OBJECTIVES** |
| **FA-001** | Briefly describe the branches of anatomy  Describe the "Anatomical Position" Describe the anatomical planes of body.  Describe the terms of relationship, commonly used in Anatomy.  Describe the anatomical terms used specifically for Limbs.  Describe the terms related to movements. |
| **FA-002** | Describe, identify, and exemplify the general morphological features of bones. Describe the developmental classification of bones.  Describe the regional classification of bones.  Describe the structural classification of bones.  Describe the morphological classification of bones.  Describe and exemplify Sesamoid, Pneumatic, Wormian & Heterotopic bones.  Describe the classification of bones on the basis of osteogenesis.  Describe relationship of growing end of bones with direction of nutrient foramen  Describe blood supply, innervation and lymphatic drainage of bones.  Describe the use of bone tissue for bone marrow biopsy and bone grafting Describe the salient features of common types of fractures |
| **FA-003** | Describe the general features of cartilage and its importance in gross anatomy.  Describe the subtypes and gross features of Hyaline Cartilage  Describe the gross features of Elastic Cartilage  Describe the gross features of Fibrocartilage.  Differentiate the three types of cartilages |
| **FA-004** | Describe and exemplify the structural classification of Joints (synovial, cartilaginous & fibrous) along with their sub-classification.  Describe the components and characteristic features of a Synovial Joint  Describe the blood supply, innervation and lymphatic drainage of Synovial Joints, cartilaginous joints, and fibrous joints.  List the factors stabilizing a synovial joint.  Describe the mechanism of movements |
| **FA-005** | Describe structure and function of Skin on the basis of its two layers; Epidermis & Dermis.  Describe the surface irregularities of the skin.  Describe the structure of Hair as an appendage of skin.  Describe the structure of Nail as an appendage of skin.  Describe the structure of Sweat and Sebaceous Glands  Describe the structure and function of Superficial Fascia  Describe the structure, function, and modifications of Deep Fascia  Describe,classify burns & anatomical basis of manifestations of integumentary system |
| **FA-006** | Define Muscle Classify Muscle based on Structure, Function and Development  Describe Somatic and Visceral Muscles,describe & differentiate the Red and White Variety of Skeletal Muscles  Describe Type A, B and C of Skeletal Muscles.  Classify & describe skeletal muscles based on architecture.  Classify skeletal muscle based on action. Describe the parts of a skeletal muscle. Describe the methods of studying skeletal muscle activity.  Describe & differentiate basic organization of innervation to skeletal, smooth & cardiac muscle.  Describe the structure of Tendons. Describe the structure of Synovial Bursae  Describe the structure of Raphe.  Comprehend the meaning of Paralysis, Spasm, Atrophy, Hypertrophy, Hyperplasia and Regeneration in relation to muscle tissue.  Define Myasthenia Gravis and Polymyositis ,Angina pectoris & Fibrillation of  Cardiac Muscle |
| **FA-007** | Classify types of blood circulation. Classify & exemplify types of blood vessels.  Describe and exemplify various types of anastomoses.  Explain the importance of End Arteries Define the terms:  Arteriosclerosis, Atherosclerosis and Varicose Veins.  Describe the general organization of Lymphatic Circulation  Define the terms: Lymphoid Tissue, Tissue Fluid, Lymphatic Capillaries, Lymph and Lymphatic Vessels  Define terms; Lymphangitis, Lymphadenitis, Lymphadenopathy & Lymphography |
| **FA-008** | Define neuron, Describe the anatomical structure of a neuron. Classify neurons based on morphology with examples.  Classify neurons based on function.  Describe components of CNS. Describe the components of PNS.  Name the supporting cells (neuroglia) of the central nervous system.  Describe structure and functions of the neuroglia of the central nervous system.  Enumerate the supporting cells (neuroglia) of the peripheral nervous system.  Describe structure & functions of the neuroglia of the peripheral nervous system.  Describe the gross and/or microscopic anatomy of following structures: Nerve,Nerve fiber, Ganglion, Tract, Fasciculus, Funiculus and Lemniscus  Enlist the cranial nerves I to XII  Describe types of nerve fibers carried by & distribution of the cranial nerves. Describe formation, types of modalities carried & distribution of spinal nerves.  Define and explain Dermatomes  Define and explain Myotomes  Describe formation of Plexuses. Differentiate between Somatic & Visceral NS.  Define Receptors, Describe the functions of receptors. Classify sensory receptors based on modality (with location)  Define Effectors Describe the functions of effectors.  Describe ANS and differentiate between sympathetic & parasympathetic NS. |
| **FA-009** | Identify displacement of fracture segments of bone & dislocation of joints  Describe the basic concept behind taking a biopsy of a tissue. |
| **FA-010** | Describe the cell cycle  Enlist different stages of Mitosis and Meiosis  Compare & contrast mitosis & Meiosis  Enlist the numerical chromosomal anomalies  Describe anatomical basis for numerical chromosomal abnormalities.  Describe clinical presentation of numerical chromosomal abnormalities & justify. Describe clinical presentation of structural chromosomal abnormalities & justify Embryologically  list the structural chromosomal anomalies, describe the anatomical basis for structural chromosomal abnormalities  Describe anatomical basis for structural & numerical chromosomal anomalies.  Describe the embryological basis for mosaicism & teratoma.  Describe clinical presentation of common numerical chromosomal abnormalities. |
| **FA-011** | Describe the Process of spermatogenesis & spermiogenesis  Describe the embryological basis for Abnormal gametes  Discuss the embryological basis of male Infertility |
| **FA-012** | Describe the Prenatal and postnatal maturation of oocyte. |
| **FA-013** | Describe the significance of arrested development of oocyte.  Describe the hormonal control of oocyte maturation  Discuss the embryological basis of female Infertility |
| **FA-014** | Compare and contrast oogenesis and Spermatogenesis |
| **FA-015** | Enlist and briefly describe the female reproductive organs |
| **FA-016** | Describe the hormonal control of female reproductive cycles  Enumerate and describe the steps of the ovarian cycle  Describe ovulation, Describe formation, function & fate of corpus luteum  Describe the anatomical & physiological basis of the following:  Mittelschmerz, Anovulation, Menopause  Define menstrual cycle, Describe phases of menstrual cycle  Describe the anatomical & physiological basis of an-ovulatory menstrual cycle |
| **FA-017** | Describe the transportation of male & female gametes & viability of gametes  Explain the anatomical basis of diaspermy, triploidy |
| **FA-018** | Define fertilization, Describe the phases of fertilization  Draw and label a diagram illustrating the phases of fertilization  Enumerate and describe the results of fertilization  Describe anatomical & physiological basis of sex determination of the embryo |
| **FA-019** | Define contraception, Explain the mechanisms of following contraceptive techniques:  1-Barrier methods -2- Hormonal methods -3- Intrauterine device (IUD)  -4- Emergency contraceptive pills (ECPs)-5- Male and female sterilization |
| **FA-020** | Describe the anatomical & physiological basis of male and female infertility  Describe the role of clomiphine citrate in inducing ovulation  Define assisted reproductive techniques Describe the mechanisms of following reproductive techniques:  In vitro fertilization (IVF) and embryo transfer, Cryopreservation of embryo  Intra-cytoplasmic sperm injection (ICSI), Assisted vivo fertilization, Surrogacy  Explain correlation of multiple births with assisted reproductive techniques |
| **FA-021** | Describe the process of cleavage of embryo and blastocyst formation Describe the differentiation of embryo blast into epiblast and hypoblast Describe the establishment of cranial- caudal embryonic axis  Describe pre-implantation genetic diagnosis  Describe origin & uses of embryonic stem cells and techniques of obtaining these cells from the embryo (reproductive cloning & therapeutic cloning).  Explain the embryological basis of spontaneous abortion  Describe the events and factors influencing the cleavage of zygote  Describe sequence of events pertaining to formation of blastocyst Compare and contrast the villi  Describe the process of Compaction, Describe, Formation of morula (division into inner and outer cell mass)  Describe the anatomical basis for the preimplantation genetic diagnosis Describe formation of amniotic cavity, embryonic disc & umbilical vesicle  Describe the formation of chorionic sac |
| **FA-022** | Describe Uterus at time of implantation (decidua reaction), Illustrate concept of Implantation Describe differentiation of inner and outer cell mass  Describe the Abnormal implantation/ extra uterine implantations  Enumerate the factors responsible forinhibition of implantation |
| **FA-023** | Describe the Molar pregnancy |
| **FA-024** | Describe the Establishment of utero-placental circulation |
| **FA-025** | Describe the embryological basis of abortions and its types |
| **FA-026** | Describe the Formation & fate of primitive streak  Draw a concept map highlighting the sequence of events responsible for transformation of bilaminar germ disc into trilaminar germ disc  Describe embryology of sacrococcygeal teratoma & justify its clinical picture  Describe the molecular factors responsible for gastrulation |
| **FA-027** | Describe the Invagination and movement of prenotochordal cells.  Describe Notochordal plate formation, Describe Neuroenteric canal.  Describe the fate of the notochord Describe the Establishment of body axis Draw, label & describe fate map establishment.  Describe the molecular basis for notochord formation, Describe the role of notochord as an inducer  Describe the embryological basis for situs inversus |
| **FA-028** | Describe the Formation of neural tube from neural plate.  Justify embryologically clinical picture seen in various neural tube defects. Describe the process of Migration of neural crest cells.  Enlist the Derivatives of neural tube and describe the fate of each.  Enlist the Derivatives of neural crest cells, Enlist the ectodermal derivatives Describe molecular & genetic, factors for the process of neurulation |
| **FA-029** | Describe the Differentiation of mesoderm into its constituting components  Describe the Somite formation & its fate.  Describe Estimation of age by somites, describe intra embryonic coelom. |
| **FA-030** | Describe processes of vasculogenesis & angiogenesis.  Explain features of primordial cardiovascular system.  Describe the anatomical justification for Capillary hemangiomas. |
| **FA-031** | Enlist the derivatives of germ layers |
| **FA-032** | Describe the formation and functions of chorionic villi |
| **FA-033** | Describe the Cephalo-caudal folding Describe the Lateral folding |
| **FA-034** | Enlist & Describe derivatives of intermediate & lateral plate mesoderm Enlist & Describe the Derivatives of endoderm, Enlist & describe derivative of ectoderm. |
| **FA-035** | Describe the factors influencing the embryonic development |
| **FA-036** | Enlist the characteristic features of the embryo during 4th 8th weeks.  Describe criteria for estimating developmental staging in human embryos Explain the estimation of gestational & embryonic age |
| **FA-037** | Explain the trimesters of Pregnancy.  Explain estimation of fetal age, measurement & characteristics of fetus.  Describe Overview of monthly external changes of fetus (9th-38th weeks)  Describe Viability of fetuses and low birth weight babies  Explain the factors influencing fetal growth, describe clinical problems encountered by babies born with IUGR and post maturity |
| **FA-037a** | Tabulate criteria for estimating fertilization age during fetal period, describe the post maturity syndrome, describe procedures for assessing fetal status.  Describe clinical picture of IUGR & factors resulting in IUGR  Correlate the levels of alpha fetoprotein essay and fetal anomalies |
| **FA-038** | List fetal membranes, describe macroscopic & microscopic features of Decidua.  Enlist parts of deciduas, functionally correlate parts of decidua with its structure.  Describe the Changes in the trophoblast leading to the development of placenta Describe the Structure (macroscopic & microscopic) of placenta. |
| **FA-038a** | Enlist & correlate the Functions of placenta with its structure  Describe the Microscopic anatomy of Placental membrane  Describe Placental circulation, embryologically justify hemolytic disease of neonate.  Describe functions of placenta, describe Placenta as an allograft & as an invasive tumor-like structure.  Describe placental anomalies & their clinical picture (placenta previa, ecreta, percreta, battledore, membranous & pre-eclampsia)  Describe the stages of labor |
| **FA-039** | Describe the Formation & fate of Umbilical cord, describe Cord abnormalities  Justify embryologically clinical features in Absence of umbilical artery  Describe the formation and circulation of Amniotic fluid.  Enlist components of amniotic fluid.  Describe Procedure of diagnostic amniocentesis.  Explain significance of amniotic fluid, describe factors responsible for Polyhydramnios & oligohydramnios, describe characteristic signs & symptoms of oligohydramnios & polyhydramnios & justify embryologically.  Explain clinical picture of umbilical band syndrome & justify embryologically  Explain the formation and fate of umbilical vesicle (yolk sac).  Explain the formation and fate of Allantois.  Describe clinical picture of allantoic cyst & sinus, justify it Embryologically |
| **FA-040** | Describe development of Dizygotic t & monozygotic twins.  Describe the fetal membranes in twin pregnancy  Describe the twin transfusion syndrome Explain the zygosity of the twins Describe characteristics of various types of conjoined monozygotic twins |
| **FA-041** | Describe Various methods of pre- natal diagnosis, describe Fetal therapy |
| **FA-042** | Define morphogens, protein kinases, notch delta pathway, transcription factors, epigenetics.  Define stem cells & pluripotency Define the human disorders associated  with genetic mutations. |
| **FA-043** | Define teratology: classification & causes of birth defects, define genomic imprinting.  Describe birth defects by genetic factors: numerical & structural anomalies.  Define & enlist teratogens, Describe role of following in causing teratogenicity in humans:  1-Drugs -2- Environmental agents Chemicals & heavy metals Infectious agents Radiation -3- Hormones Maternal diseases.  Describe the basis for male-mediated teratogens. |
| **FA-044** | Describe different types of microscopies.  Describe Staining methods and their significance.  Describe the basis of enzyme histochemistry |
| **FA-045** | Describe electron microscopic structure & fluid mosaic model of membrane.  Draw the fluid mosaic model of plasma membrane.  Draw and label the structure and function of glycocalyx coat & lipid raft.  Describe structure of glycocalyx coat & lipid raft & correlate it with function. Describe different types of membrane proteins and their functions  Explain different modes of transport across the cell membrane  Describe the signal reception and transduction through different routes Tabulate the mechanisms of transport across the cell membrane  Explain the following disorders related to cell membrane: Pseudohypoparathyroidism & Dwarfism |
| **FA-046** | List the membranous and non- membranous cellular organelles  Draw, label light & electron microscopic structure of cellular organelles.  Describe structure of following cellular organelles & correlate with function:   1. Ribosomes -2- Endoplasmic reticulum (rough & smooth) -3-Golgi apparatus -4- Lysosomes -5- Proteasomes -6- Mitochondria -7-peroxisomes   Describe clinical presentation of lysosomal storage diseases & correlate with their histological basis.  Describe structural components of cytoskeleton, correlate their functions  Explain the histological basis of immotile cilia syndrome. |
| **FA-46a** | Describe the histological features of cytoplasmic inclusions |
| **FA-46b** | Describe the structure of nuclear envelope and nuclear pores |
| **FA-047** | Describe structure of chromatin & chromosome  Draw & label the structure of nucleolus, describe the structure of nucleolus  Describe the structure and types of DNA and RNA  Describe the histological basis for apoptosis and necrosis.  Describe clinical presentation of following & correlate with histology.  Laminopathies, Malignancy  Describe the correlation of cell cycle with the following diseases.  Retinoblastoma, Malignancy  Describ histological structure & function of basement membrane (light & electron)  Describe the mechanism of ciliary movements. |
| **FA-048** | Draw & label diagram illustrating electron microscopic structure of basement membrane.  Describe the basal surface modifications of epithelia.  Describe electron microscopic structure & functions of intercellular junctions (lateral surface modifications) & give their locations.  Describe the Biochemical composition of the basolateral modifications  Explain the correlation of intercellular junctions with the following diseases:  Gastric ulcer, Food poisoning, Pemphigus vulgaris |
| **FA 048a** | Describe the electron microscopic structure of the following apical cell surface specializations: Microvilli, Sterocilia & Cilia |
| **FA-48b** | Explain the correlation between structure of microvilli & celiac disease. Classify & exemplify epithelia its histological structure, locations & functions. |
| **FA-48c** | Describe structure of exocrine glands, explain transport across epithelia.  Describe the classification of exocrine glands on the basis of:  Shape of secretory portions and ducts, Mode of secretion, Type of secretion  Explain the histological basis of acne vulgaris |
| **FA-049** | Describe the composition and list constituents of connective tissue  Classify the connective tissue with examples  Describe the composition of ground substance of connective tissue  Describe composition, distribution & function of glycosaminoglycans.  Explain the role of GAGs in formation of barrier against bacteria and the role of hyaluronidase in the breakdown of this barrier.  Describe structure, distribution, & functions of cells of macrophage-  mononuclear phagocytic system  Describe the role of macrophages in innate immunity  Describe types of adipose tissue , their histogenesis, locations and function.  Explain the etiology of Marfan”s Syndrome.  Describe lipid storage & mobilization in and from adipocytes.  Explain histological basis & clinical presentation of Lipoma & Obesity (role of leptin) |

|  |  |
| --- | --- |
| **PRACTICALS (Anatomy)** | |
| **CODE** | **SPECIFIC LEARNING OBJECTIVES** |
| **FA-050** | Demonstrate anatomical terms of position & movement, particularly limbs.  Demonstrate various anatomical movements of body.  Identify various elevations and anatomical landmarks on bones.  Identify and interpret normal radiographs of various body regions  Identify & interpret joint dislocations & displaced fracture bone segments radiographically.  Calculate fertilization age, gestational age, embryonic/fetal age & EDD. |
| **FA-051** | On models, charts, aborted embryos & fetal specimens identify the:  Events of embryonic period: cleavage, morula & blastula formation, yolk sac, amniotic cavity, conne stalk, gastrulation (notochord & primitive streak, three germ layers), angiogenesis, neurulation, somites & embryonic age determination based on it, chorionic villi (primary, secondary & tertiary), defects (sacrococcygeal teratoma, neural tube defects). Fetal features during fetal period. Determine age of fetus based on these features. Placenta & positional & implantation variations, umbilical cord contents. |
| **FA-052** | Describe the USG report for the:  fetal features, fetal age estimation, placental variations & fetal membranes. multiple pregnancies |
| **FA-053** | On gross examination of human placenta and umbilical cord identify:  normal complete placenta and cord placental structural variations  umbilical cord & anomalies of its attachment to placenta  contents of umbilical cord (umbilical vessels anomalies) |
| **FA-054** | Identify the features of haemolytic disease of newborn, dizygotic and monozygotic twins and correlate them embryologically |
| **FA-055** | Identify the protocols and procedural steps for amniocentesis and chorionic villus sampling (CVS) and correlate their significance in developmental defects. Correlate the role of alpha feto-protein  assays in neural tube defects. |
| **FA-056** | Describe different types of staining techniques and their significance with special emphasis on H&E staining |
| **FA-057** | Identify and draw different parts of light microscope |
| **FA-058** | Identify and demonstrate different cell shapes under the microscope |
| **A-059** | Identify and demonstrate under light microscope the following types of epithelia:   1. Simple squamous 2. Simple cuboidal 3. Simple columnar (ciliated & non-ciliated) 4. Pseudostratified columnar (ciliated & non- ciliated) 5. Stratified squamous (keratinized & non keratinized) 6. Stratified cuboidal 7. Stratified columnar 8. Transitional |
| **FA-060** | Identify & demonstrate serous & mucous glands under light microscope |
| **FA-061** | Identify and demonstrate the various types of connective tissue |

|  |  |
| --- | --- |
| **PHYSIOLOGY** | |
| **CODE** | **SPECIFIC LEARNING OBJECTIVES** |
| **FP-001** | Define Homeostasis, explain control system of body by giving examples.  Differentiate between Extracellular and Intracellular Fluids.  Explain the positive and negative feedback mechanisms with examples.  Explain significance of feed forward/adaptive control/delayed negative feedback mechanisms.  Explain the structure of cell membrane, enlist the types of cell membrane proteins, enumerate the functions of membrane proteins.  Define and enumerate the functions of cell Glycocalyx.  Enlist membranous and non-membranous organelles, enlist the self-replicative organelles.  Differentiate between functions of smooth and rough endoplasmic reticulum.  Explain the functions of Golgi apparatus.  Enlist the enzymes of lysosomes, explain the functions of lysosomes.  Enlist the enzymes of peroxisomes, explain the functions of peroxisomes.  Enumerate the components and functions of cytoskeleton.  Define and enlist types of endocytosis, explain the mechanism of pinocytosis  Classify different transport mechanisms,Compare the composition of Na, K and Cl in extracellular and intracellular fluid  Define and enlist different types of diffusion, explain the process of facilitated diffusion with the aid of diagram.  Define and classify different types of active transport, Describe primary and secondary active transport with examples, explain voltage and ligand gated channels with examples, name Na, K channel Blockers.  Discuss functions and significance of Na/K ATPase pump. |
| **FP-002** | Enumerate the functions of blood  Explain the composition of blood  Enumerate the plasma proteins  Discuss functions of plasma proteins & describe pathophysiology of edema |
| **FP-003** | Discuss the characteristics of red blood cells.  Explain different types of Bone marrows.  Enumerate stages & different sites of erythropoiesis at different ages.  Enumerate factors that regulate erythropoiesis, discuss site & role of erythropoietin in red blood cell production.  Explain significance of vitamin B12 & folic acid in maturation of red blood cell. |
| **FP-004** | Enumerate the types of normal hemoglobin in different ages of life  Explain the role of Iron in Hemoglobin formation.  Define blood indices, give their normal values & enumerate the conditions in which these values are disturbed.  Enlist the abnormal types of hemoglobin. |
| **FP-005** | Enumerate the types of white blood cells  Describe the characteristics and functions of Neutrophils  Explain the process of defense against invading agent by neutrophils  Define leucopenia, leukocytosis & leukemia, explain effects of leukemia on body.  Explain the process of defense against invading agent by macrophages.  Discuss different lines of defense during inflammation.  Explain functions of neutrophils & macrophages in spread of inflammation  (walling off effect).  Define the Reticuloendothelial system, enlist the different components of  Reticuloendothelial system.  Explain the characteristics and functions of basophils  Explain the characteristics and functions of eosinophils and enlist conditions in which these cells are raised. |
| **FP-006** | Enumerate different blood group types.  Explain the basis of ABO and Rh blood system  Explain the Landsteiner law |
| **FP-007** | Discuss Components of Autonomic nervous system  Explain physiological anatomy of sympathetic & parasympathetic NS.  Describe the types of adrenergic & cholinergic receptors & their functions  Explain effects of sympathetic & parasympathetic on various organs/ system of body. |
| **PRACTICALS (Physiology)** | |
| **CODE** | **SPECIFIC LEARNING OBJECTIVES** |
| **FP-008** | **(CONSENT)** Explain laboratory/clinical procedure to the subject.  Obtain verbal consent from subject before starting a procedure. Reassure the subject after the procedure |
| **FP-009** | **(MICROSCOPE)** Study of microscope |
| **FP-010** | **(ESR)** Determine Erythrocyte Sedimentation Rate |
| **FP-011** | **(PCV)** Determine packed cell volume |
| **FP-012** | **(BLOOD GROUPING)** Determination of blood group A,B & O, Rh |
| **FP-013** | **(TLC & DLC ON CBC)** Interpret Total Leucocyte Count, Differential Leucocyte Count (normal & abnormal) in a CBC report generated by Automated Cell Counter. |

|  |  |  |  |
| --- | --- | --- | --- |
| **BIOCHEMISTRY** | | | |
| **CODE** | **SPECIFIC LEARNING OBJECTIVES** | | |
| **FB-001** | Differentiate between different types of cells.  Explain the concept of organization of cells to tissue, tissues to organ, organs to system.  Differentiate between the eukaryotic and prokaryotic cells. | | |
| **FB-002** | Describe the composition and structure of cell on biochemical basis and justify it as fluid mosaic model.  Describe the structure and function of cell membrane with particular reference to the role of (i) Lipids (ii) Carbohydrates (iii) Proteins.  Explain why the cell membrane is called fluid mosaic model. | | |
| **FB-003** | Discuss the various ways of cell-to-cell communication and to the environment.  Describe cell to cell communications.  Cell signaling pathways (only G protein signaling)  Describe cell to cell adhesion. | | |
| **FB-004** | Explain the biochemical markers and importance of subcellular organelles and their inherited disorders especially:  a. I- cell disease  b. Refsum disease  c. Parkinsonism  d. Progeria | | |
| **FB-005** | Describe the chemistry of purines and pyrimidines and their linkage in nucleic acid synthesis and their metabolism | | |
| **FB-006** | Discuss the organization of DNA with special reference to Watson and crick model, composition, structure, role of pairing and genetic coding.  Describe the structural forms of DNA. | | |
| **FB-007** | Discuss the structure of different types of RNAs with special reference to composition, linkage, functions of RNA, micro RNA.  Illustrate the structure and functions of various types of RNAs.  Describe the functions of various small RNAs present in cell. | | |
| **FB-008** | Explain the structure and nomenclature of nucleotides, biomedical importance of natural and synthetic analogues  Interpret the role of synthetic analogues of nucleotides in medicine based on sign/symptoms and data e.g Methotrexate, 5 Flurouracil and Allupurinol. | | |
| **FB-009** | Explain higher organization of DNA. Difference between DNA, chromatid & chromosome. | | |
| **FB-010** | Illustrate de Novo and salvage pathways of purines and pyrimidines  Describe the degradation of purine and pyramidine Nucleotides.  Interpret Lesch-Nyhan syndrome, gout & adenosine deaminase deficiency on given data. | | |
| **FB-011** | Describe in detail all the steps in prokaryotic DNA replication with emphasis on: Different proteins required, Primers, DNA polymerase; their different components and functions, Initiation, elongation and termination of replication,Topoisomerases  Describe in detail all the steps in Eukaryotic DNA replication with emphasis on differences between Pro- and Eukaryotes. | | |
| **FB-012** | Describe DNA repair especially Xeroderma pigmentosa. | | |
| **FB-013** | Explain the transcription in prokaryotes focusing on the following key points; RNA polymerase, its components and functions, Initiation, elongation, and termination of transcription.  Illustrate transcription in eukaryotes focusing on the differences between pro- and eukaryotic transcription and post transcriptional modifications Wobble hypothesis | | |
| **FB-014** | Interpret the translation focusing on the following key points:  Initiation, elongation and termination and inhibition by drugs.  Describe Post-translational modification of proteins. | | |
| **PRACTICALS (Biochemistry)** | | | |
| **CODE** | **SPECIFIC LEARNING OBJECTIVES** | | |
| **FB-015** | **(LAB SAFETY)** Demonstrate the step taken to prevent or rectify the Laboratory Hazards | | |
| **FB-016** | **(CELL)** Identify the structure of cells under microscope | | |
| **FB-017** | **(ISOLATION)** Identify the methods of isolation of cell organelles | | |
| **FB-018** | **(LAB EQUIPMENT)** Identify the different parts of equipment i.e., centrifuge, Electrophoresis etc | | |
| **FB-019** | **(MICROLAB)** Identify the different parts of equipment i.e., Microlab | | |
| **FB-020** | **(WORKING PRINCIPLES)** Demonstrate basic principles, uses and working of centrifuge, chromatography, electrophoresis & spectrophotometer. | | |
| **PATHOLOGY** | | | |
| **CODE** | **SPECIFIC LEARNING OBJECTIVES** | | |
| **FPa-001** | Discuss the significance of pathology, discuss the causes of cell injury.  Identify the types of cell injury, describe the mechanism of cell injury  Identify the types of cell death, define necrosis and apoptosis.  Describe different types of necrosis, compare apoptosis with necrosis.  Identify different types and mechanism of cellular adaptations to stress  Discuss mechanism and types of intracellular accumulations and pathological calcifications | | |
| **FPa-002** | Enumerate the microbes causing infectious diseases.  Describe the structure of bacterial cell  Differentiate cell walls of gram positive and gram negative bacteria.  Compare the structure of bacterial cell and virus  Discuss the growth curve of bacteria.  Enlist steps of viral replication  Identify types of bacterial infections  Enlist stages of bacterial pathogenesis Discuss the determinants of bacterial pathogenesis | | |
| **FPa-003** | Define sterilization and disinfection.  Describe the principles of sterilization and disinfection.  Describe clinical uses of common disinfectants and their mode of sterilization  Discuss physical and chemical agents of sterilization. | | |
| **PHARMACOLOGY** | | | |
| **CODE** | **SPECIFIC LEARNING OBJECTIVES** | | |
| **FPh-001** | Definitions of Pharmacology, drug, pro-drug, placebo, active principles, sources of drugs;  Brief outline of Absorption, Distribution, Metabolism and Excretion | | |
| **FPh-002** | Definitions of receptor, agonist, partial agonist, inverse agonist, antagonist and types of  receptors and second messengers; Diagrammatic concept of signaling mechanisms | | |
| **FPh-003** | Pharmacological aspects of Autonomic Receptors (types of autonomic receptors, important sites and actions) | | |
| **COMMUNITY MEDICINE AND PUBLIC HEALTH** | | | |
| **CODE** | | **SPECIFIC LEARNING OBJECTIVES** | |
| **FCM-001** | | Describe the changing concepts and new philosophy of health.  Explain responsibility for health. | |
| **FCM-002** | | Explain dimensions and determinants of health and their role in achieving positive health.  Discuss concept of health and wellbeing.  Describe the Physical quality of Life Index & Human Development Index. | |
| **FCM-003** | | Describe the importance of health indicators.  Classify health indicators.  Calculate Morbidity and Mortality.  Describe Disability indicators, compare indicators among countries. | |
| **FCM-004** | | Conceptualize disease causation and natural history of disease.  Explain Germ theory & multifactorial causation.  Describe Epidemiological Triad.  Discuss Web of disease causation.  Describe Gradient of infection. | |
| **FCM-005** | | Describe principles of prevention and control on prevalent diseases.  Explain difference between elimination and eradication.  Describe disease surveillance, types and cycle.  Explain Primary, secondary, & tertiary prevention.  Describe five levels of interventions. | |
| **AGING** | | | |
| **CODE** | | **SPECIFIC LEARNING OBJECTIVES** | |
| **Fag-001** | | Discuss telomeres and telomerase and their clinical significance in aging. | |
| **IMPACT (EPIDEMIOLOGY, SOCIOLOGY/SOCIETY,COMMUNITY MEDICINE & PUBLIC HEALTH)** | | | |
| **FBhS-001** | | Identify the Biological Basis of human behavior and discuss social behavior.  Describe processes such as neurobiology of memory, emotions, sleep, learning, motivation, sex, arousal, reward and punishment. | |
| **FBhS-002** | | Identify the burden of mental illness on the person, family and society.  Describe intellectual disability, mental disorders and personality disorders. | |
| **FBhS-003** | | Identify the role of psychosocial factors in various illnesses.  Describe psychosocial aspects of various system diseases such as CVS, CNS, GIT, Respiration, renal, endocrine and Cancer. | |
| **FBhS-004** | | Identify the behavioral factors associated with pharmacological treatment of diseases.  Discuss Health belief model, treatment compliance and its psychosocial factors, social  factors in drugs prescription and drug resistance. | |
| **FBhS-005** | | Identify the rehabilitation work for patients on dialysis and any kind of physical disability  Discuss the care requirements in chronic debilitating conditions like Diabetes, Multi infarcts Dementia, chronic renal disease, limb amputation. | |
| **FBhS-006** | | Identify various physiological effects of stress, explain ANS response to stress, describe behavioural manifestations of stress.  Stress related multiple sclerosis and autoimmune diseases. | |
| **PROFESSIONALISM, ETHICS, RESEARCH AND LEARDERSHIP** | | | |
| **CODE** | | | **SPECIFIC LEARNING OBJECTIVES** |
| **PERLs1-01** | | | Describe a portfolio  Describe types of portfolios  Identify portfolio entries  Write reflection based on Gibbs reflective cycle |
| **PERLs1-02** | | | Demonstrate non-verbal and verbal communication skills.  Describe principles of communication.  Discuss types of communication at professional level.  Identify different communication styles.  Explain the importance of non-verbal communication.  Demonstrate active listening.  Describe assertive communication techniques.  Describe barriers to effective communication |
| **PERLs1-03** | | | Follow the dress code and rules and regulations of the institution.  Demonstrate punctuality |
| **PERLs1-04** | | | Describe characteristics of a team describe types of teams  Discuss stages of team development identify various team roles  Discuss barriers to effective teamwork |
| **PERLs1-05** | | | Maintain personal privacy while sharing information  Identify cyber bullying, harassing, and sexting  Describe cyber security laws  Discuss digital rights and responsibilities |
| **CIVICS** | | | |
| **CODE** | | | **SPECIFIC LEARNING OBJECTIVES** |
| **Civics-Meaning & Nature** | | | Define civics  Describe how civics can improve the citizenship, illustrate the scope of civics  Discuss nature of civics, give examples how civics can help in national development |
| **Significance and Utility** | | | Examine significance of civics , explain how civics is important to know the  problems of daily life.  Discuss how civics can help to bring improvements in the civics life of citizens  Evaluate how civics can improve sense of love and respect for human relationship  Discuss that studying civics can develop a sense of gratitude  Give examples how civics is important to develop the global unity |
| **HOLY QURAN** | | | |
| **CODE** | | | **SPECIFIC LEARNING OBJECTIVES** |
| **TAWHEED** | | | Describe unity of Allah (SWT) in being – describe unity of Allah(SWT) in attributes  Describe concept of shirk – impact of tawheed in human life |
| **RISALAT** | | | Explain significance of risalat, identify prophets as role model  Recognize finality of prophethood-Prophet Muhammad (PBUH) |
| **ISLAMIAT** | | | |
| **CODE** | | | **SPECIFIC LEARNING OBJECTIVES** |
| **NAMAAZ**  **(Prayer)** | | | Recognize the importance of physical purity (Tahrah), discuss the philosophy of prayer and its role in purification of soul.  Recognize the importance of prayer in building personal character, sense of duty, patience, perseverance, punctuality and self/social discipline.  Spiritual, moral and social impact of prayer in building of righteous community  Role in creating brotherhood, equality and unity in ummah  Identify the conditions in which relaxation in prayer is allowed: e.g operation, travelling etc |
| **PAKISTAN STUDIES** | | | |
| **CODE** | | | **SPECIFIC LEARNING OBJECTIVES** |
| **Pak-mov** | | | Describe the salient features of the Pakistan movement |
| **CLINICAL SKILLS FOUNDATION** | | | |
| **CODE** | | | **SPECIFIC LEARNING OBJECTIVES** |
| **CSF-1** | | | Demonstrate steps of hand washing (surgery & allied) |
| **CSF -2** | | | Demonstrate the procedure of taking pulse (Medicine & allied) |
| **CSF -3** | | | Record the respiratory rate of the patient (Medicine & allied) |
| **CSF -4** | | | Demonstrate the procedure of taking blood pressure (Medicine & allied) |
| **CSF -5** | | | Demonstrate the process of wearing the gloves (surgery & allied) |
| **SKILL LAB** | | | |
| **CODE** | | | **SPECIFIC LEARNING OBJECTIVES** |
| **SL-1** | | | Demonstrate steps of hand washing |
| **SL-2** | | | Demonstrate the procedure of taking pulse |
| **SL-3** | | | Record the respiratory rate of the patient |
| **SL-4** | | | Demonstrate the procedure of taking blood pressure |
| **SL-5** | | | Demonstrate the process of wearing the gloves |
| **ENGLISH** | | | |
| **E-1** | | | **Essay writing:** understand what writing an assignment involves. Understand the functions of essays and reports. |
| **E-2** | | | **Interviewing skills:** how to prepare for interview |
| **E-3** | | | **Pressy** |
| **E-4** | | | **Grammar:** basics of grammar and tenses |

**OPERATIONAL DEFINITIONS**

|  |
| --- |
| **Large group interactive session (LGIS)** |
| Lecture format is the most widely used approach to teaching especially in a large class size with average attention span of 20-30 minutes. Interactive lecturing involves a two-way interaction between the presenter and the participants. Interactive methods like brain storming buzz group, simulation, role play, and clinical cases can be used.  **Significance of its usage**  Relaxed environment, diverse opinions, Increase attention & motivation. Independence & group skills. Cost effective. Suitable for taking advantage of available |
| **Team Based learning** |
| TBL is a uniquely powerful form of small group learning. It provides a complete coherent framework for building a flipped course experience. There are four essential elements of TBL which include:  Teams must be properly formed and managed (5-7 students) Getting students ready  Applying course concepts Making students accountable.  **Significance of its usage**  Students are more engaged.  Increased excitement in TBL classroom Teams outperforms best members.  Students perform better in final and standardized exams. |
| **Problem Based Learning (PBL)** |
| It is an instructional student-centered approach in which students work in small groups on a health problem, identifying their own educational needs and being responsible for the acquisition of the knowledge required to understand the scenario.  **Significance of its usage**  Teamwork, Critical evaluation of literature, Self-directed learning and use of resources Presentation skills Leadership |
| **Case Based Learning (CBL)** |
| It is an inquiry structured learning experience utilizing live or simulated patient cases to solve, or examine a clinical problem, with the guidance of a teacher and stated learning objectives.  **Significance of its usage**  Induce a deeper level of learning by inculcating critical thinking skills. Flexibility on use of case  Students acquire insightful information. Stay abreast with novel advancements in healthcare. |
| **Tutorial** |
| Tutorial is a class or short series of classes, in which one or more instructors provides intensive instruction on some subject to a small group. Its purpose is to explore point of view and guide towards directed, reflective learning skills.  **Significance of its usage**  Develop and assess the extent of background knowledge of students, which enables them to properly understand concepts which may not have been understood in lectures.  Develop problem-solving skills. Develop practice of self-learning. Reduced time to understand the topic. |
| **Skill lab** |
| It refers to specifically equipped practice rooms functioning as training facilities offering hands on training for the practice of clinical skills within non-threatening environment prior to their real-life application This applies to both basic clinical skills as well as complex surgical skills.  **Significance of its usage**  Controlled, anxiety-free, and risk-free learning environment to students. A platform for repeated practice for mastery in relevant clinical skills Increase the preparedness of student learners before transitioning to the real hospital setting.  Build strong communication skills.  Enable learners to make critical decisions. |
| **Lab practical** |
| Lab practical involve things like identifying a structure, a type of stain through a microscope, a problem with a preparation, reading biochemical test results and answering safety questions. These simulations allow students to attempt the experiments in the laboratory in a risk-free way that provides the opportunity to make mistakes and learn how to correct them using the immediate feedback generated.  **Significance of its usage**  Enhance mastery of subject matter. Develop scientific reasoning. Develop practical skills. Develop teamwork abilities. |
| **Demonstration** |
| The demonstration method in teaching can be defined as giving a demo or performing a specific activity or concept. It is a teaching-learning process carried out in a systematic manner.  **Significance of its usage**  Promotes learning and correlates theory with practice. Sharpens the observation skills.  Sustain interests in learning environment. Helps teacher to evaluate students response |

**ASSESSMENT POLICY**

A student must get pass marks in every discipline (i.e. obtain minimum 50%) in the aggregate theory marks. He/ She must also get minimum of 50% in the aggregate of the practical/OSPE/OSCE exams in order to pass. A student must get an aggregate of 50% marks in both theory and practical in order to be declared as pass in that discipline.

**Attendance**

As per RYK Medical College, University of health sciences and Pakistan Medical & Dental Council guide lines, students are instructed to attend all the lectures, small group discussions, labs, clinical ward attachments and all other instructional activities. **80% attendance is mandatory to sit in End of module examination and Annual examination. No student will be allowed to appear in examination, if the attendance is short.**

**Internal Assessment:**

Each module’s internal assessment should be calculated as following:-

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **INTERNAL ASSESSMENT BREAKDOWN PER MODULE (1st Year M.B.B.S)** | | | | | |
| Foundation  (8 Weeks) | Hematology & immunology  (3 Weeks) | Musculoskeletal  (9 Weeks) | Cardiovascular  (7 Weeks) | Respiratory  (5 Weeks) | Practical & viva |
| 4% | 1.5% | 4.5% | 3.5% | 2.5% | 4% |
| **Total = 20% (1st Year M.B.B.S)** | | | | | |

* Students will be assessed comprehensively through multiple methods (MCQs, OSPE, OSCE, Viva and Practical Examinations.
* 20% marks of internal evaluation will be added to University of health sciences (UHS) final examination score as per university’s rules and regulations.

**Formative Assessment:**

Individual department may hold quiz or short answer questions to help students assess their own learning. The marks obtained are not included in the internal evaluation

**RYKMC EXAMINATION RULES & REGULATIONS**

* Student must report to examination hall/venue, 30 minutes before the exam.
* Exam will begin sharp at the given time.
* No student will be allowed to enter the examination hall after 15 minutes of scheduled examination time.
* Students must sit according to their roll numbers mentioned on the seats.
* Cell phones are strictly not allowed in examination hall.
* If any student is found with cell phone in any mode (silent, switched off or on) he/she will be not be allowed to continue their exam.
* No students will be allowed to sit in exam without University Admit Card, RYKMC College ID Card and Lab Coat
* Student must bring the following stationary items for the exam: Pen, Pencil, Eraser, and Sharpener.
* Indiscipline in the exam hall/venue is not acceptable. Students must not possess any written material or communicate with their fellow students.

**For UHS Examination Policy, please consult UHS website!**

**TABLE OF SPECIFICATIONS (TOS) FOUNDATION MODULE**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Theme** | **Written exam** | | | | **Oral practical clinical examination** | | | |
| Subjects | MCQ  (1 mark) | SEQ  (5mark each) | Marks | **OSPE/OSCE/Viva stations** | | | **Marks** |
| OSPE  (8 marks each observed) | OSCE  (8 marks each observed | Structured viva (16 marks each) |
| Normal structure | Anatomy & applied clinical | 20 | 3 | **35** | 3 | ---------- | 1 | **40** |
| Normal function | Physiology & applied/clinical | 22 | 2 | **32** | 2 | ---------- | 1 | **32** |
| Biochemistry & applied/clinical | 22 | 2 | **32** | 2 | ---------- | 1 | **32** |
| Disease burden & prevention | Community medicine & public health | 05 | ---------- | **05** | ---------- | ---------- | ---------- | ---------- |
| Behavioral sciences | 05 | ---------- | **05** | ---------- | ---------- | ---------- | ---------- |
| Pathophysiology & pharmacotheraeutics | Pathology | 06 | ---------- | **06** | ---------- | ---------- | ---------- | ---------- |
| Pharmacology | 05 | ---------- | **05** | ---------- | ---------- | ---------- |  |
| CFRC | CF1-1 | ---------- | ---------- | ------- | ---------- | 1 | ---------- | 8 |
| PERLS | PERLs1-1 | ---------- | ---------- | ------- | ---------- | 1 |  | 8 |
|  |  | **85** | **7×5=35** | **120** | **7 stations×8=**  **56** | **2stations×8=16** | **3 viva ×16=48** | **120** |

**EOM EXAMINATION SCHEDULE & OSPE/OSCE/VIVA SCHEME**

|  |  |  |  |
| --- | --- | --- | --- |
| **DATE/DAY** | **EXAMINATION** | **TIME** | **VENUE** |
| ---/---/2025-26 | **Preparation leave** | | |
| ---/---/2025-26 | Theory | 09:00 - 12:00 | Roll # 1 - 50 (multipurpose hall) |
| Roll # 51 – 100 (skill lab) |
| ---/---/2025-26 | OSPE/OSCE/Viva | 08:00 – 04:00 | Roll # 1 – 50 (multipurpose hall) |
| ---/---/2025-26 | OSPE/OSCE/Viva | 08:00 – 04:00 | Roll # 51 – 100 (multipurpose hall) |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Station # 5**  **OSPE**  **Observed**  **Anatomy** | **→** | **Station # 6**  **Rest Station** | **→** | **Station # 7**  **OSCE**  **Observed**  **PERLs** | | **→** | **Station # 8**  **Structured**  **Viva**  **Biochemistry** |
| **↑** | **Foundation Module OSPE/OSCE/Viva Scheme Map** | | | | | | **↓** |
| **Stations breakdown** | | | | **Station numbers** | |
| **Station # 4**  **Structured**  **Viva**  **Anatomy** | **Anatomy OSPE Stations =**3  **Anatomy Viva Station =** 1  **Physiology OSPE stations =** 2  **Physiology viva station =** 1  **Biochemistry OSPE stations =** 2  **Biochemistry Viva station =** 1  **C-FRC OSCE station =** 1  **PERLS OSCE station =** 1  **Rest stations =** 2  **Total stations =** 14 | | | | 1/5/10  4  2/9  13  3/11  8  12  7  6/14 | | **Station # 9**  **OSPE**  **Observed**  **Physiology** |
| **↑** | **↓** |
| **Station # 3**  **OSPE**  **Observed**  **Biochemistry** | **Station # 10**  **OSPE**  **Observed**  **Anatomy** |
| **↑** | **↓** |
| **Station # 2**  **OSPE**  **Observed**  **Physiology** | **Station # 11**  **OSPE**  **Observed**  **Biochemistry** |
| **↑** | **↓** |
| **Station # 1 OSPE**  **Observed**  **Anatomy** | **START**  **&**  **END** | **Station # 14**  **Rest Station** | **←** | **Station # 13**  **Structured**  **Viva**  **Physiology** | | **←** | **Station # 12**  **OSCE**  **Observed**  **C-FRC** |

**ASSESSMENT TOOLS & SAMPLE QUESTIONS**

**ASSESSMENT TOOLS:**

**Single best type** also known as MCQs (Multiple Choice Questions)

**MCQ:** A BCQ has a statement or clinical scenario of five options (likely answers).

**Correct answer carries one mark, and incorrect ‘zero mark’. There is NO negative marking.**

Students mark their responses on specified computer-based sheet designed for RYKMC.

**Sample BCQs:**

A 25 year old male patient presented with complains of productive cough, breathlessness and wheezing. He has been diagnosed with chronic obstructive pulmonary disease.

The most common risk factor for the disease is:

a) Air pollution

b) Coal mining

c) Glass industries

d) Pharmaceutical industries

e) Tobacco smoke

**OSPE: Objective Structured Practical Examination (See the proposed plan of OSPE)**

* It may comprise between 12- 25 stations.
* The content may assess application of knowledge, or practical skills.
* Student will complete task in define time at one given station.
* All the students are assessed on the same content by the same examiner in the same allocated time.
* A structured examination will have observed, unobserved, interactive and rest stations.

**Observed and interactive stations:**

They will be assessed by internal or external examiners through the task or viva.

**Unobserved station (Static):**

It will be static station in which students will have to answer the questions related to the given pictures, models or specimens on the provided response sheet.

**Rest station**: It is a station where no task is given, and during this time student can organize his/her thoughts.

**BOOKS & RECOMMENDED READINGS**

**Anatomy**

* Gray’s anatomy.
* Langman’s medical embryology.
* Snell’s clinical anatomy.
* Laiq H.S general anatomy. Paramount books.
* Wheater’s functional histology.

**Physiology**

* Guyton AC and Hall text book of medical physiology, W,B sunders & co.
* Essentials of medical physiology by Mushtaq Ahmad.
* Ganong Physiology.

**Biochemistry**

* Harper’s biochemistry by Robert k murray, daryl k, granner McGraw-hill.
* Lippincott’s illustrated reviews biochemistry Champe, P.C & Harvey.

**Pathology**

* Pathologic basis of disease by Vinary kumar, abul K, Abbas WB saunders.
* Pocket companion to pathologic basis of diseases,Richard Mitchall, vinary.

**Pharmacology**

* Basic and clinical pharmacology by katzung, MCGraw-hill
* Pharmacology by champe and Harvey, Lippincott Williams & wilkins.

**Behavioral sciences**

* Hand book of behavioral sciences by prof Mowadat H Rana 3rd edition

**Community medicine**

* Parks textbook of preventive and social medicine, K park
* Public health and community medicine Ilyas, Ansari

**Surgery**

* Bailey & love short practice of surgery

**Medicine**

* Davidson’s principles and practice of medicine

**Islamiyat/Pakistan studies**

* Standard islamiyat (compulsory) for B.A, B.sc, M.A, M.sc by professor M. sharif islahi
* Pakistan studies (compulsory) for B.A, B.sc,B.com, Medical/Engineering by prof Shah Jahan

**English**

* Oxford English grammar
* Oxford essay writing

**Next Module- Hematology & Immunology will start from ----- of (Month) 2025-26**