Foundation-II module for Year-3 MBBS

(Prepared by the Department of Medical Education-
Khyber Medical College Peshawar)

List of Themes

Total Duration: 5 weeks

Theme	Duration
Molecules, bacteria and cell injury	3 weeks
Ageing and death	2 weeks

General learning Outcomes

By the end of Foundation-2 Module, 3rd year MBBS students will be able to:

1) Define pathology, its different branches and enumerate clinically important bacteria.
2) Describe the structure of bacterial cell and mechanisms by which they cause the disease.
3) Describe methods used to identify different microbes in laboratory and explain the interventions employed to prevent infections including vaccines.
4) Describe cell injury, its different mechanisms and sub cellular responses to cell injury.

5) Describe necrosis, apoptosis and adaptive changes seen in clinical settings and its identification in surgical specimens.
6) Define common terms related to Pharmacology.
7) Describe the basic principles of pharmacokinetics and pharmacodynamics and apply these principles to clinical practice as they relate to drug absorption, distribution, metabolism, excretion, mechanism of action, clinical action and toxicity.
8) Describe the cellular and biochemical sites where drugs bind to act.
9) Describe the general principles of drug interactions in relation to clinical practice.
10) Describe the process of new drug development.
11) Identify different dosage forms of drugs.
12) Demonstrate searching accurate information quickly in a formulary.
13) Demonstrate administration of a drug through intramuscular and intravenous routes.
14) Write down the basic format of drug prescription and describe the general principles of prescribing drugs.
15) Write correctly medical abbreviations used in clinical practice.
16) Identify commonly used equipments in pharmacy.
17) Describe Forensic medicine, its different branches and importance.
18) Describe law and its various components.
19) Explain medicolegal system and legal procedure for a doctor.
20) Describe the contents of medical jurisprudence.
21) Describe the diagnosis of death and WHO death certificate.
22) Describe different refractive errors and its management.
23) Explain causes of watery eyes in both infants and elders and its management.
24) Describe the basic concept of health, disease and primary health care.
25) Demonstrate different pathological laboratory procedures and identify gross and microscopic features in the given specimens.
26) Demonstrate professionalism, respect, honesty and compassion by behaving in a courteous manner with colleagues and teachers during course activities like long lectures, SGDs and Practicals.

27) Describe the PMC code of Ethics
28) Describe the steps of process of developing a research protocol

Specific learning objectives

Theme-1 (Molecules and Bacteria)				
Subject	**Topic**	**Hours needed**	**Sr.**	**Learning objectives At the end of this module, the students of year-3 will be able to:**
Pharmacology	Introduction to the subject	1	1	Define basic terms like Pharmacology, Clinical Pharmacology, Therapeutics, drug, medicine, pro-drugs, prototype drugs, Materia medica, pharmacopoeia, formulary, national formulary, poisons, toxins, pharmacokinetics, pharmacodynamics, excipient, compounding and dispensing.
			2	Describe the branches of Pharmacology like Pharmacy, Pharmacognosy, pharmacogenetics, pharmacogenomics, toxicology and posology.
			3	Define prescription drugs, OTC drugs, WHO essential drugs and Orphan drugs with examples.
	Nomenclature of drugs	1	4	Describe how drugs are named, i.e. chemical, generic, approved,

				official and trade names of drugs with examples.
	Sources of drugs	1	5	Enlist various sources of drugs.
			6	Give examples of drugs obtained from plants, animals, mineral and synthetic sources.
			7	Describe the genetic engineering source of drugs with examples.
	Active principles of crude drugs		8	Enlist important principles of crude drugs with examples.
	Routes of drug administration	2	9	Enlist various routes of drug administration.
			10	Describe the merits and demerits of oral, sublingual, rectal, intramuscular, subcutaneous, intravenous, intra-arterial, inhalational, spinal, topical and transdermal routes of drug administration.
			11	Give examples of drugs given through oral, sublingual, rectal, intramuscular, subcutaneous, intradermal, intravenous, intra-arterial, inhalational, spinal, topical and transdermal routes of drug administration.
			12	Describe the difference between topical and transdermal routes of drug administration.

			13	Describe the difference between subcutaneous and intradermal routes of drug administration.
	Absorption of drugs	1	14	Define drug absorption.
			15	Describe various mechanisms of drug absorption like simple diffusion, facilitated diffusion, active transport, ion-pair transport, endocytosis and filtration with examples.
			16	Describe the concept of ionization of drug molecules and clinical significance of ion trapping.
			17	Describe factors affecting drug absorption.
	Bioavailability and Bioequivalence	1	18	Define bioavailability, bioequivalence and pharmaceutical equivalence.
			19	Explain Time-Concentration curve.
			20	Describe AUC (Area Under the Curve).
			21	Describe the factors affecting bioavailability.
	Hepatic first-pass effect (Pre-systemic elimination)	1	22	Describe hepatic first-pass effect (Pre-systemic elimination) and its clinical significance.
	Enterohepatic circulation		23	Define enterohepatic circulation.
			24	Describe enterohepatic circulation

				with examples and its clinical significance.
	Distribution of drugs	1	25	Define distribution of drugs.
			26	Define redistribution of drugs with example.
			27	Describe plasma protein binding and its clinical significance in diseased conditions.
			28	Describe factors affecting drug distribution.
	Volume of distribution		29	Define volume of distribution.
			30	Enlist drugs with small volume of distribution.
			31	Enlist drugs with large volume of distribution.
			32	Apply formula for calculating volume of distribution.
			33	Describe volume of distribution with reference to its clinical significance.
	Loading dose		34	Define loading dose of a drug.
			35	Enlist some drugs whereby loading dose is administered.
			36	Apply formula for calculating loading dose.
	Physiological barriers to transport of drugs	1	37	Enlist important physiological barriers to transport of drugs.
			38	Describe important physiological barriers to transport of drugs like

				blood-brain barrier and placental barrier with reference to their clinical significance.
	Biotransformation (metabolism) of drugs	1	39	Define biotransformation.
			40	Define xenobiotics.
			41	Describe the objectives of biotransformation and fate of drugs after biotransformation.
			42	Name major sites of biotransformation.
			43	Describe major drug metabolizing enzymes i.e. microsomal (P450) and non-microsomal enzymes.
			44	Describe the phases and reactions of biotransformation.
			45	Describe the factors affecting drug biotransformation.
	Genetic influence on biotransformation of drugs	1	46	Define pharmacogenetics and pharmacogenomics.
			47	Define idiosyncrasy with examples.
			48	Describe the genetic factors influencing biotransformation of drugs with examples.
	Enzyme induction		49	Define enzyme induction.
			50	Enlist enzyme inducers.
			51	Describe enzyme induction and its

				clinical significance.
	Enzyme inhibition		52	Define enzyme inhibition.
			53	Enlist enzyme inhibitors.
			54	Describe enzyme inhibition and its clinical significance.
			55	Describe suicide inhibition (mechanism-based inhibition) with examples of drugs.
	Excretion of drugs and drug clearance	1	56	Define drug excretion and drug clearance.
			57	Enlist major and minor routes of drug excretion.
			58	Differentiate between excretion, elimination and clearance.
			59	Apply the formula for calculating drug clearance.
	Maintenance dose		60	Define maintenance dose of a drug.
			61	Apply the formula for calculating the maintenance dose.
			62	Apply Young's formula, Dilling's formula and Clark's formula for calculating doses of drugs.
	Plasma half life		63	Define plasma half-life.
			64	Enlist drugs with short half-life.
			65	Enlist drugs with long half-life.
			66	Apply the formula for calculating plasma half life.

			67	Explain the clinical significance of half life.
	Steady-state concentration of drugs	1	68	Define steady-state concentration of drugs.
			69	Describe the time to reach steady-state concentration of drugs.
			70	Describes the importance of steady-state concentration in clinical practice.
	First- and zero-order kinetics		71	Define first- and zero-order kinetics.
			72	Differentiate between first- and zero-order kinetics with examples.
			73	Explain the clinical significance of first- and zero-order kinetics
	Bioassay and standardization		74	Define bioassay and standardization.
			75	Describe the relative importance of bioassay compared with physical or chemical assays.
			76	Describe the most common type of bioassay, i.e. three-point assay.
	Pharmacodynamics	2	77	Define pharmacodynamics.
			78	Define agonist, antagonist, partial agonist and inverse agonist with examples.
			79	Describe receptors.
			80	Define orphan receptors, serpentine receptors and spare receptors.

			81	Describe the biochemical and cellular sites of drug targets.
			82	Describe intracellular Second-messenger system and enlist some important Second-messengers.
			83	Describe up regulation and down regulation of receptors with examples.
			84	Define drug selectivity and specificity.
	Dose-response curves (Graded and Quantal)	1	85	Define dose response curve, graded dose-response curve and quantal dose-response curve.
			86	Describe graded dose-response curve and quantal dose-response curve.
			87	Describe the limitations of graded dose-response curve and its remedy in a quantal dose-response curve.
			88	Describe the significance of constructing dose-response curves.
			89	Explain the advantages of taking log dose values on the dose axis.
	Therapeutic index	1	90	Define therapeutic index.
			91	Describe therapeutic index with reference to its clinical importance.
			92	Apply formula for calculating therapeutic index
			93	Define median lethal dose, median toxic dose and median effective

				dose.
			94	Enlist some drugs with narrow therapeutic index.
			95	Enlist some drugs with broad therapeutic index.
	Protective index		96	Define protective index.
			97	Differentiate between therapeutic index and protective index.
	Therapeutic window	1	98	Define therapeutic window.
			99	Describe therapeutic window with reference to its clinical importance.
	Potency and efficacy		100	Define potency and efficacy.
			101	Describe potency and efficacy with examples.
			102	Describe the clinical importance of efficacy compared to potency.
	Drug antagonism		103	Define drug antagonism.
			104	Enlist types of antagonism.
			105	Describe chemical, physiological (functional) and pharmacological (competitive/surmountable and non-competitive) antagonisms with examples.
	Drug interactions	1	106	Define drug interaction.
			107	Define drug incompatibilities with examples.
			108	Describe pharmacokinetic drug

				interactions with examples and its clinical significance.
			109	Describe pharmacodynamics drug interactions with examples and its clinical significance.
			110	Describe drug-food interactions and drug-disease interactions with examples.
			111	Define summation, synergism and potentiation with examples.
	Tolerance and Tachyphylaxis	1	112	Define Tolerance, cross tolerance, reverse tolerance (sensitization), innate tolerance, tachyphylaxis and drug resistance.
			113	Describe the mechanisms of development of tolerance and tachyphylaxis.
			114	Define drug holidays with example.
	Adverse drug reactions	1	115	Define adverse drug effect, secondary effect and intolerance to a drug.
			116	Classify adverse drug reactions.
			117	Describe dose-related adverse effects (side effects and toxic effects) with examples.
			118	Describe non-dose-related adverse effects (idiosyncrasy and drug allergy) with examples.
			119	Describe causes of adverse drug reactions.
			120	Enlist some drugs causing hepatotoxicity.
			121	Enlist some drugs causing renal

				toxicity.
			122	Enlist some cardio toxic drugs.
			123	Enlist some drugs causing adverse effects on reproduction.
	New drug development	1	124	Describe the processes involved in drug discovery and development.
			125	Define lead compound and drug screening.
			126	Describe pre-clinical and clinical studies.
			127	Define placebo, placebo response and nocebo response.
			128	Define no-effect dose and minimum lethal dose.
			129	Describe 04 phases of clinical trials.
			130	Define post-marketing surveillance.
			131	Define single-blind, double-blind, crossover and ADME studies.
			132	Describe the role of Food and Drug Administration (FDA) in the drug development process.
			133	Differentiate between IND (Investigational New Drug) and NDA (New Drug Application).
Pathology	Introduction to the subject	1	134	Define pathology, microbiology and list its major branches
			135	Describe essential characteristics of five major groups of microorganisms
			136	Differentiate between prokaryotes and eukaryotic cells based on their structure and complexity of their

				organization
	Introduction to cell	1	137	Define cell
			138	Describe structure of cell membrane
			139	Describe cell organelles
	Classification of Bacteria	1	140	Describe classification of bacteria based on oxygen requirement as aerobes and anaerobes with examples.
			141	Describe classification of bacteria based on staining characteristics, nature of cell wall, ability to grow in the presence of oxygen and ability to form spores.
	Structure of bacterial cell	1	142	Describe structure and function of each of various parts of the bacterial cell including cell wall, cytoplasmic membrane, Mesosome, ribosomes, granules and nucleoid
			143	Describe specialized structures outside the cell wall including capsule, flagella, pilli and glycocalyx
			144	List the differences between cell wall characteristics of Gram Positive and Gram Negative Bacteria
			145	Describe classification and important functions of plasmids.
			146	Describe functions and arrangement of transposons.
			147	Describe structure, functions and medical importance of bacterial

				spores with examples.
	Bacterial growth curve	1	148	Describe various phases of bacterial growth curve
	Normal Flora		149	Describe medically important members of normal flora and their anatomic location
	Bacterial genetics	1	150	Define mutation
			151	Describe the classification of various types of mutations and their common causes.
			152	Describe methods of transfer of DNA within bacterial cells including process of conjugation, transduction, recombination and transformation.
	Lab diagnosis of bacterial infections	1	153	Describe the bacteriologic approach to diagnosis of bacterial infections including blood, throat, stool, sputum, spinal fluid, urine, genital tract and wound cultures.
			154	Describe general principals of various immunologic and nucleic acid based methods for identification of an organism.
	Bacterial pathogenesis	1	155	Define the term pathogen, infection, virulence, communicable, endemic, epidemic and pandemic diseases, carrier, pathogens, opportunists, commensals and colonizers.
			156	Describe stages/determinants of bacterial pathogenesis.

			157	Describe colonization, invasion, toxins, immune-pathogenesis.
			158	Differentiate between exotoxins and endotoxins.
			159	Describe the various modes of action of endotoxins and endotoxins produced by gram positive and gram-negative bacteria.
			160	Describe the four stages of a typical infectious disease and Koch's postulates for establishing the causal role of an organism in the disease.
	Antibacterial Vaccines	1	161	Define immunization and vaccination.
			162	Describe role of immunization in inducing active and passive acquired immunity.
			163	Enlist the current bacterial vaccines and their indications.
			164	Describe various types of bacterial vaccines in terms of composition, preparation, indications, route of administration and common side effects.
Forensic medicine	Introduction to the subject of Forensic Medicine	1	165	Describe forensic medicine and its various branches
			166	Describe pillars of forensic medicine
				Describe the various terminologies

				used in forensic medicine
	Introduction to medicolegal system		167	Discuss different prevailing medicolegal systems in the world
	Introduction to Law	1	168	Define law.
			169	Describe its various types.
	Legal proceedings		170	Describe court procedures for a doctor
	Chain of evidence		171	Describe evidence, its types and recording of evidence
	PPC and CrPC		172	Describe the relevant sections of Pakistan penal code and CrPC
	Medical jurisprudence	1	173	Describe the components of medical jurisprudence (consent, negligence, secrecy, professional misconduct and privileged communication)
			174	Describe code of medical ethics
			175	Describe the duties of a registered medical practitioner
ENT	Introduction to the subject	1	176	Describe common ENT symptoms.
			177	Name common diseases of ENT.
			178	Name recommended books that students must read.
Ophthalmology	Introduction to the subject; Career in Ophthalmolo	1	179	Define Ophthalmology and its branches

	gy			
			180	Highlight the scope of field of Ophthalmology as a future career
	Refractory errors	1	181	Describe refractive error and its effect on vision.
			182	Describe the concept of myopia and its correction.
			183	Describe the concept of hypermetropia and its correction.
			184	Describe the concept of astigmatism & cylindrical lens.
			185	Describe the concept of presbyopia, its possible causes and correction.
			186	Describe aphakia and possible methods of its correction.
	Watery Eyes	1	187	Explain the structural details, development and functions of lacrimal system.
			188	Correlate the clinical presentation of watery eye with anatomical structures.
			189	Correlate the clinical features with a disease entity.
			190	Describe the causes, clinical features and treatment of congenital nasolacrimal duct obstruction.
			191	Assess the time of probing.
			192	Describe the causes, clinical presentation and treatment modalities.
			193	Differentiate between acute and

				chronic dacryocystitis.
Community medicine	Introduction to the subject	1	194	Define Community medicine and Public health
			195	Describe the role of teaching of public health in prevention of diseases
	Health system of Pakistan: Introduction	1	196	Define health care system of Pakistan using WHO Health system frame work
	Health and disease	2	197	Define community medicine, public health and preventive medicine.
			198	Discuss the history and philosophy of public health as well as its concepts and functions regionally & globally.
			199	Describe the stages in the natural history of a disease.
			200	Describe epidemiological triad, web of causation and multifactorial causation
			201	Describe the dimensions and determinants of health
			202	Describe the indicators of health and its characteristics
			203	Discuss the concept of disease control
			204	Discuss the different levels of prevention and their modes of interventions.
			205	Explain the natural history of disease.

			206	Describe the iceberg phenomenon
			207	Describe mode of intervention of diseases with emphasis on health education.
	Primary Health Care	1	208	Define Primary health care (PHC).
			209	Describe the elements of PHC, its principles and strategies for implementation of PHC.
			210	Describe Health for all by the year 2000.
			211	Enumerate the MDGS & SDGS related to health.
			212	Describe the history of development of PHC
			213	Describe comprehensive & selective PHC
			214	Describe reasons for failure of PHC
			215	Describe Health Systems before & after PHC
			216	Describe district health care system
			217	Enumerate indicators for assessing PHC
PRIME	Personal identity	1	218	Describe personal identity in the context of medical education
	Professional identity		219	Define professional identity and Describe the basic pre-requisites of professional identity formation
	Patient safety, clinical governance and quality	1	220	Explain the concept of patient safety, clinical governance and quality improvement in primary healthcare

	improvement			
	Professionalism-Trust	1	221	Explain the dynamics of professionalism and trust in health professional-patient relationship
			222	Adheres to principles of trust in day to day professional interactions
	Professional identity formation-Types and Multiple identities		223	Define professional identity formation and explain the Students' roles in terms of professional identity
	Motivation	1	224	Explain motivational skills for team members for clinical tasks
	Theme-2 (Aging and Death)			
Subject	**Topic**	Hours needed	Sr.	**Learning objectives At the end of this module, the students of year-3 will be able to:**
Pathology	Cellular injury, cell death	2	225	Define the following terms: Pathology, disease, etiology, pathogenesis, morphology, cell injury and homeostasis.
			226	Describe the causes of cell injury from gross physical trauma to single gene defect.
			227	Describe the nature and severity of cell injury with cellular responses.

			228	Enumerate different classes of pathology.
			229	Describe the following basic mechanisms of cell injury: General Biochemical mechanisms, Ischemic and hypoxic injury, Ischemic/reperfusion injury, Free radical induced cell injury and chemical injury.
			230	Differentiate between reversible and irreversible cell injury.
			231	Describe the mechanism, morphological and biochemical changes and functional alterations in reversible and irreversible cell injury.
			232	Define phagocytosis, endocytosis, pinocytosis, autophagy and heterophagy.
			233	Describe the subcellular responses to injury including lysosomal catabolism, heterophagy and autophagy.
	Cellular adaptation	1	234	Describe types of cellular adaptations.
			235	Differentiate between physiologic and pathologic adaptation.
			236	Define hypertrophy, hyperplasia, atrophy and metaplasia.
			237	Describe the causes and mechanism of hypertrophy, hyperplasia, atrophy and metaplasia.
			238	Describe hypertrophy of the smooth

				endoplasmic reticulum with examples and mitochondrial alterations.
			239	Describe cytoskeletal abnormalities in pathological states with examples.
	Necrosis	1	240	Define necrosis.
			241	Describe types of necrosis with examples.
			242	Describe the mechanism and morphology of necrosis.
	Apoptosis		243	Define apoptosis.
			244	Describe physiological and pathological causes of apoptosis with examples.
			245	Describe morphology with alterations in cell structure.
			246	Describe the biochemical features of apoptosis altering the cell structure.
			247	Describe the intrinsic and extrinsic pathways of apoptosis.
			248	Differentiate between necrosis and apoptosis.
			249	Describe role of apoptosis in health and disease.
			250	Describe the mechanism and causes of cellular ageing including genetic & environmental factors, structural & biochemical changes.
			251	Describe adaptive changes in clinical settings.
	Steatosis	1	252	Describe causes and mechanism of

				steatosis.
			253	Explain the morphology and consequences of steatosis.
	Intracellular accumulations		254	Describe three general pathways for abnormal intracellular accumulations.
			255	Define steatosis.
			256	Describe causes, mechanism, morphology and consequences of lipid accumulation.
			257	Describe causes, mechanism, morphology, consequences of protein and glycogen accumulation
			258	Describe types of pigments
			259	Differentiate between endogenous and exogenous pigments.
	Pathologic calcification		260	Define Pathologic calcification
			261	Describe types, morphology and functional alterations of pathologic calcification with examples.
			262	Differentiate between dystrophic and metastatic calcification.
Forensic Medicine	Introduction to Thanatology; Death	1	263	Define death and describe its phases.
			264	Describe criteria of diagnosis of death.
			265	Enlist the importance of diagnosis of death
			266	Describe the medicolegal aspects of brain stem death and suspended animation

			267	Define cause, mode, manner and mechanism of death
			268	Enlist various methods of disposal of dead body
	Death certificate	1	269	Define cause of death
			270	Describe the WHO format of death certificate
Ophthalmology	Cataracts	1	271	Define cataract
			272	Describe the types of cataracts
			273	Describe the pathogenesis and complications of cataracts
			274	Describe the management of cataracts
PRIME Research	Research Protocol	1	275	Describe the steps of developing a research protocol
	Health system research	1	276	Define research and health system research.
			277	List types of research.
			278	Describe characteristics of health system research.
			279	Describe building blocks of health system.
			280	Discuss key areas of concern in health system.
			281	Discuss briefly research methodology.
	Purpose and process of health research	1	282	Define and categorize types of health research
			283	Explain the purpose of health

				research
Family Medicine	History and current structure of general practice	1	284	Describe the historical perspectives of general practice
			285	Explain the structure of general practice nationally and internationally
	Models of healthcare		286	describe the models of healthcare
	Essential health service package (levels of health services in KP)		287	Describe the levels of health services in the province of KP
	Practical work			
Pharmacology	Lab protocols; Introduction to Pharmacy; Apparatus used in Pharmacy	1.5	288	Identify and name common apparatus used in pharmacy laboratory.
			289	Identify and label common apparatus used in the field of Pharmacy.

	Metrology & Medical abbreviations	1.5	290	Define metrology.
			291	Describe metric and imperial systems of measurements.
			292	Calculate the equivalency of metric system with imperial system.
			293	Describe the common medical abbreviations.
			294	Apply these abbreviations correctly in medical documentations.
	Dosage forms of drugs	1.5	295	Define dosage form.
			296	Enlist the types of dosage forms.
			297	Describe the characteristic properties of each dosage form.
			298	Identify dosage forms administered through different routes.
	Searching information in a formulary	1.5	299	Define formulary.
			300	Describe National Formulary.
			301	Demonstrate searching accurate information quickly in a formulary.
	To demonstrate IM and IV injection of drugs on a dummy (manikin)	1.5	302	Describe the general protocols for IM and IV injection of a drug.
			303	Demonstrate standard protocols

				during administration of a drug through Intramuscular route.
			304	Demonstrate standard protocols during administration of an IV drug through Intravenous route.
	Prescription writing	1.5	305	Define a medical prescription.
			306	Describe the components of a prescription.
			307	Describe how to reduce medication errors.
			308	Define compliance to the prescribed treatment.
			309	Write down the basic format of drug prescription.
Pathology	Biosafety procedures/ Precautions in Microbiology Lab	1.5	310	Define sterilization and disinfection.
			311	Demonstrate steps of hand washing.
			312	Enlist various physical and chemical methods of sterilization and disinfection.
			313	Define biosafety and biosecurity.
	Tissue processing	1.5	314	Describe steps involved in tissue processing.
			315	Identify various tools/instruments involved in tissue processing and their indications.
			316	Demonstrate slide focusing.
	Gram	1.5	317	Describe principal and significance

	staining			of Gram staining.
			318	Enlist steps of Gram staining.
			319	Demonstrate Gram staining procedure.
			320	Identify Gram positive and Gram-negative bacteria morphologically under the microscope.
	ZN staining	1.5	321	Describe principal and significance of ZN staining.
			322	Enlist steps of ZN staining.
			323	Demonstrate ZN staining procedure.
			324	Identify AFB and inflammatory cells microscopically.
	Culture media	1.5	325	Define terms like culture, bacterial colony, media, aerobe, anaerobe, agar, selective and differential.
			326	Describe classification of culture media.
			327	Describe basic and enriched media, transport media, selective media and differential media.
			328	Describe preparation/ inoculation of culture media.
			329	Enlist ingredients, indications, important properties and organisms grown on various culture media.
	Bacterial motility	1.5	330	Enumerate motile bacteria
			331	Identify motile bacteria under the microscope
	Hyperplasia	1.5	332	Define hypertrophy and hyperplasia.

	(BPH)			
			333	Differentiate between hypertrophy and hyperplasia.
			334	Describe gross and microscopic morphology of BPH.
			335	Identify the slide of BPH.
	Atrophy (Testicular atrophy)		336	Define atrophy
			337	Describe gross and microscopic features of atrophy over a slide of testicular atrophy as an example
	Pathologic calcification		338	Describe causes and various types of calcification.
			339	Identify the slide.
Forensic medicine	Death certificate	1.5	340	Formulate death certificate based on WHO criteria
	Legal procedure	1.5	341	Doctor in a witness box- role play
	Recording of evidence	1.5	342	Recording of dying declaration
	Consent form	1.5	343	Take written informed consent for various procedures

Number of hours needed for different subjects in the module

S. No	Subject	Hours needed
1	Pharmacology	32
2	Pathology	25
3	Forensic medicine	12
4	Community medicine	8

5	Family medicine	1
6	PRIME and Research	4+3
7	Eye	3
8	ENT	1
	Total	86