

SRI BALAJI VIDYAPEETH

(Deemed – to be – University u/s 3 of UGC Act, 1956)

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COMPETENCY BASED UNDERGRADUATE MEDICAL CURRICULUM VOLUME-I

(ANATOMY, PHYSIOLOGY, BIOCHEMISTRY)

(2020 Onwards)

(As approved at the 30th Academic Council Meeting held on 28th September 2020)

Preface

The curriculum forms the rudimentary base for any robust educational program. Effective implementation of the curriculum plays a central role in the program outcome. In medical education, the outcome that is expected is to produce competent doctors who are adept at all the three domains, namely knowledge, skills and attitude.

In order to produce a competent doctor in the modern era it is imperative to have a healthy mix of traditional medical curricula and value based additions. Taking cognizance of this need, the apex council, namely Medical Council of India (MCI) has taken the lead in this direction.

MCI was established in the year 1933 and ever since has been entrusted with the important task of standardization of the medical education in the country. Thus, the MCI has formulated Graduate Medical Education regulations, which aim at not only providing training to medical undergraduates, but also recognize the health rights bestowed on Indian citizens. Besides, the MCI has assiduously been facilitating compliance with the National health policy in addressing both the immediate and long time health needs of the society.

However, over the years vivid gaps among societal health needs have emerged with respect to the availability of health care and the medical education that is being imparted. The gaps have been largely instrumental in sub optimal response to fulfil the expectations of the society. To bridge this gap, the MCI has implemented Competency Based Undergraduate Medical Education (UGCBME) which has now acquired proper shape and effective dimension.

Sri Balaji Vidyapeeth (SBV), Puducherry, a Deemed to be University, declared u/s 3 of The UGC Act. has been accredited by NAAC with A grade. SBV is committed in letter, spirit and action in not only fulfilling the aim and objectives of MCI towards implementation of CBME, but also has functioned as the torch bearer in this endeavor. SBV has thus adopted the undergraduate CBME curriculum, as described by MCI but modified to suit the strength of its students, infrastructure and most importantly the need of the community.

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Preface

According to Frank, et. al. in 2010, CBE is defined as “Competency-based education (CBE) is an approach to preparing physicians for practice that is fundamentally oriented to graduate outcome abilities and organized around competencies derived from an analysis of societal and patient needs. It de-emphasizes time-based training and promises greater accountability, flexibility, and learner- centeredness”.

In 1997, it was notified by Medical Council of India (MCI) that regulations on Graduate Medical Educations need a relook. In 2001, the Outcome Project was initiated by the Accreditation Council for Graduate Medical Education (ACGME), United States, to emphasize the „educational outcomes’. As a refinement measure towards assessment and defining the training pathway the ACGME launched the „Milestones Project’ in 2007. The Royal College of Physicians and Surgeons of Canada (RCPSC) expressed the outcome of undergraduate medical training in terms of seven „roles’. These roles were: medical expert, communicator, collaborator, manager, health advocate, scholar and professional. Although late, marching along with global movement towards Competency- Based Medical Education (CBME), it took more than twenty years for the MCI to bring out a Competency-Based Medical Curriculum. This was possible with the contributions and efforts from resource person, teachers and students.

The key components of GMR 20119 are as follows 1. Concept of Indian Medical Graduate (IMG) as an achievable goal 2. Roles that define roles of IMG 3. Define global competencies for each role envisaged 4. Define subject based out-come that can be mapped to global competencies 5. Alignment of instruction with reasonable integration 6. Greater emphasis on learner centric instruction 7. Greater emphasis learning in primary and secondary care environment 8. Student -Doctor method of training 9. Emphasis on skill acquisition and certification 10. Early clinical exposure 11. Longitudinal program on attitude, ethics and communication 12. Foundation course 13. Shared responsibility and self-directed learning 14. Electives 15. Time for sports and extracurricular activities 16. Assessment changes.

Although the Medical Council of India (superseded by the Board of Governors) released three volumes of the curricular framework for the proposed Competency-based Undergraduate Medical Education, Sri Balaji Vidyapeeth, Puducherry, Deemed-to-be-University, declared u/s 3 of the UGC Act. Accredited by the NAAC with A grade, is pleased to bring out its own curriculum document, aligning with MCI document, with great detail that suits best to its student community. It gives us immense pleasure, to be a part, in implementing this competency based undergraduate curriculum.



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1. Preamble

The new Graduate Medical Education Regulations attempts to stand on the shoulder of the contributions and the efforts of resource persons, teachers and students (past and present). It intends to take the learner to provide health care to the evolving needs of the nation and the world.

More than twenty years have passed since the existing Regulations on Graduate Medical Education, 1997 was notified, necessitating a relook at all aspects of the various components in the existing regulations and adapt them to the changing demography, socio-economic context, perceptions, values and expectations of stakeholders. Emerging health care issues particularly in the context of emerging diseases, impact of advances in science and technology and shorter distances on diseases and their management also need consideration. The strong and forward looking fundamentals enshrined in the Regulations on Graduate Medical Education, 1997 has made this job easier. A comparison between the 1997 Regulations and proposed Graduate Medical Education Regulations, 2018 will reveal that the 2018 Regulations have evolved from several key principles enshrined in the 1997 Regulations.

The thrust in the new regulations is continuation and evolution of thought in medical education making it more learner-centric, patient-centric, gender-sensitive, outcome - oriented and environment appropriate. The result is an outcome driven curriculum which conforms to global trends. Emphasis is made on alignment and integration of subjects both horizontally and vertically while respecting the strengths and necessity of subject-based instruction and assessment. This has necessitated a deviation from using “broad competencies”; instead, the reports have written end of phase subject (sub) competencies. These “sub-competencies” can be mapped to the global competencies in the Graduate Medical Education Regulations.

A significant attempt has been made in the outcome driven undergraduate curriculum to provide the orientation and the skills necessary for life-long learning to enable proper care of the patient. In particular, the curriculum provides for early clinical exposure, electives and longitudinal care. Skill acquisition is an indispensable component of the learning process in medicine. The curriculum reinforces this aspect by necessitating certification of certain essential skills. The experts and the writing group have factored in patient availability, access, consent, number of students in a class etc. in suggesting skill acquisition and assessment methods; use of skills labs, simulated and guided environments are encouraged. In the pre-internship years,- the highest level of skill acquisition is a show

how (SH) in a simulated or guided environment; few skills require independent performance and certification - these are marked with P (for performance). Opportunity to, perform' these skills will be available during internship.

The importance of ethical values, responsiveness to the needs of the patient and acquisition of communication skills is underscored by providing dedicated curriculum time in the form of a longitudinal program based on Attitude, Ethics and Communication (AETCOM) competencies. Great emphasis has been placed on collaborative and inter-disciplinary teamwork, professionalism, altruism and respect in professional relationships with due sensitivity to differences in thought, social and economic position and gender.

In addition to the above, an attempt has been made to allow students from diverse educational streams and backgrounds to transition appropriately through a Foundation Course. Dedicated time has been allotted for self-directed learning and co-curricular activities.

Formative and internal assessments have been streamlined to achieve the objectives of the curriculum. Minor tweaks to the summative assessment have been made to reflect evolving thought and regulatory requirements. Curricular governance and support have been strengthened, increasing the involvement of Curriculum Committee and Medical Education Departments/Units.

The curriculum document in conjunction with the new Graduate Medical Education Regulations (GMR), when notified, must be seen as a “living document” that should evolve as stakeholder requirements and aspirations change. We hope that the current GMR does just that. The Medical Council of India is grateful to all the teachers, subject experts, process experts, patients, students and trainees who have contributed through invaluable inputs, intellectual feedbacks and valuable time spent to make this possible. This document would not have been possible without the dedicated and unstinting intellectual, mental and time-consuming efforts of the members of the Reconciliation Board of the Council and the Academic Cell of MCI.

Extract from the Graduate Medical Education Regulations, 2018

Competencies for the Indian Medical Graduate

Section 1 - provides the global competencies extracted from the Graduate Medical Education Regulations, 2018. The global competencies identified as defining the roles of the **Indian Medical Graduate** are the broad competencies that the learner has to aspire to achieve; teachers and curriculum planners must ensure that the learning experiences are aligned to this Manual.

2. Objectives of the Indian Graduate Medical Training Programme

The undergraduate medical education program is designed with a goal to create an “Indian Medical Graduate” (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a physician of first contact of the community while being globally relevant. To achieve this, the following national and institutional goals for the learner of the Indian Medical Graduate training program are hereby prescribed:-

2.1. National Goals

At the end of undergraduate program, the Indian Medical Graduate should be able to:

- (a) recognize “health for all” as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his/her social obligations towards realization of this goal.
- (b) learn every aspect of National policies on health and devote herself/himself to its practical implementation.
- (c) achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.
- (d) develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.
- (e) become exemplary citizen by observance of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

2.2. Institutional Goals

In consonance with the national goals, each medical institution should evolve institutional goals to define the kind of trained manpower (or professionals) they intend to

produce. The Indian Medical Graduates coming out of a medical institute should:

- (a) be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.
- (b) be competent to practice preventive, promotive, curative and rehabilitative medicine in respect to the commonly encountered health problems.
- (c) appreciate rationale for different therapeutic modalities, be familiar with the administration of the "essential drugs" and their common side effects.
- (d) be able to appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the patients in discharging one's professional responsibilities.
- (e) possess the attitude for continued self-learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.
- (f) be familiar with the basic factors which are essential for the implementation of the National Health Programs including practical aspects of the following:
 - (i) Family Welfare and Maternal and Child Health (MCH);
 - (ii) Sanitation and water supply;
 - (iii) Prevention and control of communicable and non-communicable diseases;
 - (iv) Immunization;
 - (v) Health Education;
 - (vi) Indian Public Health Standards (IPHS) at various level of service delivery;
 - (vii) Bio-medical waste disposal; and
 - (viii) Organizational and or institutional arrangements.
- (g) acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, General and hospital management, principal inventory skills and counseling.
- (h) be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures.

- (i) be able to work as a leading partner in health care teams and acquire proficiency in communication skills.
- (j) be competent to work in a variety of health care settings.
- (k) have personal characteristics and attitudes required for professional life including personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

All efforts must be made to equip the medical graduate to acquire the skills as detailed in Table 11 Certifiable procedural skills – A Comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) – Indian Medical Graduate, as given in the Graduate Medical Education Regulations, 2018

2.3 Goals for the Learner

In order to fulfil this goal, the Indian Medical Graduate must be able to function in the following roles appropriately and effectively:

- 2.3.1. Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.
- 2.3.2. Leader and member of the health care team and system with capabilities to collect, analyze synthesize and communicate health data appropriately.
- 2.3.3. Communicator with patients, families, colleagues and community.
- 2.3.4. Lifelong learner committed to continuous improvement of skills and knowledge.
- 2.3.5. Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.

3. Competency Based Training Programme of the Indian Medical Graduate

Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real life situations. In order to effectively fulfill the roles as listed in clause 2, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

3.1 Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion

- 3.1.1 Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioral and

social perspective.

- 3.1.2 Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioural and social perspective.
- 3.1.3 Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence health care.
- 3.1.4 Demonstrate knowledge of national and regional health care policies including the National Health Mission that incorporates National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.
- 3.1.5 Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.
- 3.1.6 Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.
- 3.1.7 Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.
- 3.1.8 Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.
- 3.1.9 Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.
- 3.1.10 Maintain accurate, clear and appropriate record of the patient in conformation with legal and administrative frameworks.
- 3.1.11 Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.

3.1.12 Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health programmes and policies for the following:

- Disease prevention,
- Health promotion and cure,
- Pain and distress alleviation, and
- Rehabilitation and palliation.

3.1.13 Demonstrate ability to provide a continuum of care at the primary and/or secondary level that addresses chronicity, mental and physical disability.

3.1.14 Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.

3.1.15 Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

3.2 Leader and member of the health care team and system

3.2.1 Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals

3.2.2 Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.

3.2.3 Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.

3.2.4 Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.

3.2.5 Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.

- 3.2.6 Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancer, in collaboration with other members of the health care team.

3.3 Communicator with patients, families, colleagues and community

- 3.3.1 Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.
- 3.3.2 Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.
- 3.3.3 Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.
- 3.3.4 Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision making

3.4 Lifelong learner committed to continuous improvement of skills and knowledge.

- 3.4.1 Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills
- 3.4.2 Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.
- 3.4.3 Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.
- 3.4.4 Demonstrate ability to search (including through electronic means), and critically reevaluate the medical literature and apply the information in the care of the patient.
- 3.4.5 Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.

3.5 Professional who is committed to excellence is ethical, responsive and accountable to patients, community and the profession.

- 3.5.1 Practice selflessness, integrity, responsibility, accountability and respect.
- 3.5.2 Respect and maintain professional boundaries between patients, colleagues and society.

3.5.3 Demonstrate ability to recognize and manage ethical and professional conflicts.

3.5.4 Abide by prescribed ethical and legal codes of conduct and practice.

3.5.5 Demonstrate a commitment to the growth of the medical profession as a whole.

2. Program Educational Objectives (PEO)

Program Educational Objectives are broad statements that describe what graduates are expected to attain within few years of completing their program. These are based on the needs of the society as analysed and outlined by the regulatory bodies. As defined in the MCI document, the roles of the Indian Medical Graduate are being considered as program educational objectives for under graduate program and are as follows:

- **PEO1: Clinician** who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.
- **PEO2: Leader** and team member who understands health care system and acts to provide safe patient care with accountability and responsibility.
- **PEO3: Communicator** possessing adequate communication skills to convey required information in an appropriate manner in various health care settings.
- **PEO4: Lifelong learner** keen on updating oneself regarding the advancement in the health care field and able to perform the role of researcher and teacher.
- **PEO5: Professional** who understands and follows the principle of bio-ethics / ethics related to health care system.

3. Program Outcome (PO)

Program outcomes represent broad statements that incorporate many areas of inter-related knowledge and skills developed over the duration of the program through a wide range of courses and experiences. They represent the big picture, describe broad aspects of knowledge, skill and attitude development, and encompass multiple learning experiences.

At the end of the 5 ½ years of training IMG of MGMCRI should be able to:

- **PO1.** Perform the duty of a general physician.
- **PO2.** Gather a history and perform a physical examination.
- **PO3.** Prioritize a differential diagnosis following a clinical encounter.
- **PO4.** Recommend and interpret common diagnostic and screening tests.
- **PO5.** Enter and discuss orders and prescriptions.
- **PO6.** Document a clinical encounter in the patient record.

- **PO7.**Recognize a patient requiring urgent or emergent care and initiate evaluation and management.
- **PO8.**Collaborate as a member of an inter professional team.
- **PO9.**Communicate effectively and appropriately with patient and their families, colleagues and other health care members, and other stake holders in the community.
- **PO10.**Form clinical questions and retrieve evidence to advance patient care.
- **PO11.**Give or receive a patient handover to transition care responsibility.
- **PO12.** Obtain informed consent for tests and/or procedures.
- **PO13.** Identify system failures and contribute to a culture of safety and improvement.

4. Foundation Course

Objective of the document

The objective of this document is to facilitate institutions and faculty in implementing a **Foundation Course** of one-month duration at the beginning of the MBBS course that will sensitise the fresh medical student with the required knowledge and skills that will assist him/her in acclimatising to the new professional environment which would be his/her milieu for a life-long career in the medical profession. The Foundation Course will also provide a sound foundation for learning in the MBBS course and later in their professional career. While the institutions are expected to abide by the general guidelines, local changes can be made depending on the context and requirements.

Introduction

Medical education in India requires training in a wide spectrum of domains that involves exposure to human interactions and interpersonal relationships in various settings including hospital, community, clinics etc. The training is intense and demands great commitment, resilience and lifelong learning. Students enter a new environment in medical college at around 17 years of age directly from school which can be challenging. Therefore, it is desirable to create a period of acclimatisation and familiarization to the new environment. This would include an introduction to the course structure, learning methods, technology usage, and peer interactions which would facilitate their smooth transition from high school to medical college.

This is proposed to be achieved through a dedicated one month exclusive

“Foundation Course”, at the beginning of the MBBS course, to orient and sensitize the student to the various identified areas. Many of these identified areas will need to be followed up by more focused outcome-based sessions at various stages in the MBBS course. This will be achieved through activities/small courses integrated throughout the course which will be like the thread running through a garland. At appropriate stages throughout the course, emphasis will be laid on the various essential roles of the “Indian Medical Graduate”.

Purpose

The purpose of the Foundation Course include:

- a) Orienting the students to all aspects of the medical college environment.
- b) Equipping them with certain basic, but important, skills required for patient care and enhancing their communication, language, computer and learning skills.
- c) Providing opportunity for peer and faculty interactions and an overall sensitisation to the various learning methodologies.

Major Components

The major components of the Foundation Course include:

- **Orientation Program:** This includes orienting students to all the components mentioned in GMER 9.1 and should be completed as one block in the first week.
- **Skills Module (Basic):** This involves skill sessions such as Basic Life Support, First Aid, Universal precautions and biomedical waste and safety management that students need to be trained prior to entering the patient care areas.
- **Field visit to Community and Primary Health Centre:** These visits provide orientation to the care delivery through community and primary health centres, and include interaction with health care workers, patients and their families.
- **Professional development including Ethics:** This is an introduction to the concept of Professionalism and Ethics. This component will provide students with understanding that clinical competence, communication skills and sound ethical principles are the foundation of professionalism. It will also provide understanding of the consequences of unethical and unprofessional behaviour, value of honesty, integrity and respect in all interactions. Professional attributes such as accountability, altruism, pursuit of excellence, empathy, compassion and humanism will be addressed. It should inculcate respect and sensitivity for gender, background, culture, regional and language diversities. It should also include respect towards the differently abled persons. It introduces the students to the basic

concept of compassionate care and functioning as a part of a health care team. It sensitises students to “learning” as a behavior and to the appropriate methods of learning.

Orientation to Professionalism and Ethics will continue as the AETCOM module after the first month of the MBBS course and throughout the first year, with reinforcement of the various components introduced.

- **Sports and Extracurricular activities:** These have been included, in order to demonstrate the importance of work-life balance in a demanding profession, and provide an opportunity for students to have compulsory physical activity and to showcase their talents. The Foundation Course should have compulsory 4 hours per week for sports and 2 hours per week for extracurricular activities, adding up to 22 hours.

- **Enhancement of Language / Computer skills / Learning Skills:** These are sessions to provide opportunity for the students from diverse background and language competence to undergo training for speaking and writing English, fluency in local language and basic computer skills. The students should be sensitized to various learning methodologies such as small group discussions, skills lab, simulations, documentation and concept of Self-Directed learning.

Structure of the program for students

Table.1

Subjects/ Contents	Total Teaching hours
Orientation ¹	30
Skills Module ²	35
Field visit to Community Health Centre	8
Professional Development including ethics	40
Sports and Extracurricular activities	22
Enhancement of language/ computer skills ³	40
Total teaching hours	175

1. Orientation course will be completed as single block in first week and will contain elements outlined in the section
2. Based on perceived needs the students may choose any or both of language enhancements (English or local spoken or both) and computer skills. This should be available longitudinally throughout the duration of the Foundation Course and afterwards.

Foundation Course will be organized by co-ordinator appointed by Dean of the college and will be under supervision by the heads of preclinical departments.

Foundation Course Modules

- 1. Orientation Module** **Total hours:30**
- Orientation Module: Introduction to institution / campus /facilities
 - Orientation Module: Role of doctors in the society
 - Orientation Module: History of Medicine and alternate systems
 - Orientation Module: IMG roles / overview MBBS curriculum various career pathways.
 - Orientation Module : Principles of family practice
- 2. Skills Module:** **Total hours: 35**
- First AID
 - BLS
 - Universal precautions
 - Waste management
 - Immunization
 - Documentation
- 3. Community orientation module** **Total hours:8**
- National Health goals and policies/ health Care systems/ community health
 - Community Orientation Module: Interactions with patients and families, Communities.
- 4. Professional Development and Ethics Module (P&E)** **Total hours:40**
- Concept of Professionalism and Ethics
 - White coat Ceremony
 - Professional behaviour and altruistic behaviour
 - Working in a health care team
 - Disability competencies
 - Cultural competence
 - Stress management
 - Time management
 - Interpersonal relationship
 - Learning
- 5. Enhancement of Language and Computer Skills Module** **Total hours: 40**
- Communication

- Local Language training
- English Language training
- Computer Skills training

6. Sports and extra-curricular activities

Total hours:22

- Sports should be for a mandatory 4 hours per week and extra-curricular activities 2 hours per week, subject to a total of 22 hours.

Assessment

- Foundation Course is compulsory and an attendance of 75% will be mandatory
- Feedback, comments and/or grades about the student's performance by the faculty mentor can be documented particularly for the skill straining
- The performance of the students in the Foundation Course will **NOT** contribute towards internal assessment marks.
- Student's feedback about the Foundation Course also needs to be documented in a structured format. This will help in gathering student's perceptions about various aspects of Foundation Course and help in program evaluation and refinement.

5. Orientation

The purpose of the Orientation Module is to provide the new MBBS student a greater understanding of the medical profession in a historical, local and national context, a knowledge of the institution in which he/she will spend the next six years, and an idea of his/her role as an MBBS student. The medical students at the very beginning of their course should have a clear understanding of the goals of their training, the expectations of the nation, the vision and mission of the institution, Rules and Regulations of the organisation. They must also be provided an orientation to the campus and the facilities available.

Objectives:

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

- Explain the Roles of the Indian Medical Graduate
- Discuss their expectations from the Nation, institution, society, colleagues and peers and vice versa
- Understand the Rules and Regulations of the Institution
- Familiarise themselves with the college campus, facilities, administrative structure, support systems and processes of the institution

Methodology

Table 2. Orientation

No.	Content area	Methodology	Time
1	Welcome and Introduction by institutional heads	Inspiring talk to the new MBBS graduates and their parents	2 hours
2	Vision / Mission of the institution		
3	Roles of an Indian Medical Graduate		
4	Expectation of the students from Nation, Society, Institutions, colleagues and peers	Overview lecture/ interactive discussion	1 hour
4	Rules and Regulations of the institution	Overview lecture/ interactive discussion	1 hour
5	Orientation to the college / campus / facilities	<ul style="list-style-type: none"> ▪ Walk through the college including lecture halls, common rooms, preclinical departments, office of the Dean and administration, library, food facilities, security facilities, auditorium– ▪ mini talks at important facilities regarding Rules and Regulations 	4 hours
6	Introduction to faculty / mentors	Interactive session with faculty mentors and peers	2 hours

Assessment: Open feedback at the end of the Foundation Course

Role of doctors in the society

It is important for new entrants to the new MBBS program to have a clear understanding of the roles and responsibilities of a doctor in society and the expectations from society, patients and the profession. It is important to sensitise and inspire students to the wider roles of physicians in society beyond patient-doctor interaction.

Objectives:

At the end of this session, the student will be able to:

1. Appreciate the wider role of physicians in society beyond the physician – patient interaction
2. Reflection their own potential roles in society

At the end of this session, the moderators will be able to:

1. Better understand the attitude of students who join the medical course regarding their perceptions of the social role of physicians
2. Review the session and make plans for:
 - a. Further sessions
 - b. The session next year

Methodology

Table 3. Methodology for Role of doctors in the society

No	Sub session	Methods	Requirements	Time
1	Introduction	Moderators, observers and other participants		10 minutes
2	Role of doctors buzz groups	<ul style="list-style-type: none"> • Create buzz groups of 10 students each • Ask each group to list, discuss and note down on separate cards the various roles of doctors • After 10 minutes, ask one student from each batch to bring up their cards to put on four different posters which will be labelled at the back as – diagnostic role, treating role, physician-patient interactive roles, societal role. • The students will be blinded to labels at the back of poster. The moderator will help them separate and place their cards. • At the end, the entire group will view the posters – the moderator will turn the posters around to show the poster titles at the back • The discussion that follows will be based on the nature of responses: • Do the students see the doctor within a constrained role? • Is there a societal role for doctors in all conditions? – is there an even greater relevance in a diverse, unequal society like India • Is there a possibility that doctors remove themselves from society – us (ivory tower) AND them – the concept of isolationism and the, urbancitadel’ 	<p>10 cards per group i.e. 150 cards</p> <p>Felt pens</p> <p>04 large black poster sheets</p> <p>A4 white paper – for notes and observations</p>	30 minutes

3	Short film	<p>Short film: In Silence – maternal mortality in India Discussion:</p> <p>Is this a medical problem or are there wider problems? If there are wider problems, what are they? What can doctors do to address wider problems? Do doctors have privileged roles in society that they can exploit for greater common good?</p>	LCD projector with adequate sound facilities	30 minutes
4	Meet the doctor	<p>Meet the doctor:</p> <p>Three doctors with diverse backgrounds who have chosen wider roles in society: They introduce themselves and their work</p> <p>Interview them:</p> <ul style="list-style-type: none"> ● Why did they choose this option? ● What were the choices that they had to make? ● What challenges did they face? ● What advice, if any, would they give to these students? 	Arrange chairs for visitors to face the students	60 minutes
5	Wrap up	<p>Wrap up:</p> <p>Each student gets one card.</p> <ul style="list-style-type: none"> ● Think of one social issue in your own local area. ● What could you do to help address that issue? <p>Students stick it on a poster entitled –</p> <ul style="list-style-type: none"> ● I AM PART OF SOCIETY – ICAN CONTRIBUTE TOIT ● Time for entire batch to review what has been put up- ● Which of the sessions did you like the most & why? 	150 cards 4 black poster sheets 60 brief feedback questionnaires	30 minutes

Table 4. Alternative method for Role of doctors in the society

No	Sub Session	Methods	Requirements	Time
1	Introduction	An interactive lecture to discuss the roles of a physician and the expectation from the patient, families and society. followed by small group discussion Videos / clippings relating to the roles of the doctor could also be used as a trigger for discussion	LCD projector, audio output for video, Appropriate Videoclips, Flip charts, Markerpens	1 hour
2	Shadowing the physician	Students asked to shadow Physicians and observe patient-physician interaction and their expectations from doctors		2 hours
3	Reflection	Small group discussion and reflection		2 hours
4	Wrap up	Summarize salient points		10 minutes

Assessment: Formative: May be assessed by active discussion in the small group session or by Reflective writing in log book.

History of Medicine and alternate systems

Students at the time of entry into MBBS must be introduced to the evolution of the system of medicine which they will be learning and appreciate the great men and women behind many of the seemingly mundane practices and concepts in modern medicine. The students should also be introduced to the alternative systems that are available and how they can impact patient preferences and choices.

Objectives

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

1. Discuss the History of Medicine
2. Distinguish Alternative Medicine, Complementary Medicine and Evidence based Medicine
3. Discuss the various Alternative Medicine practices in India and its practice impact Methodology

Table 5. Methods for History of Medicine and alternate systems

No	Sub Session	Methods	Requirements	Time
1	Overview	lecture/ interactive discussion	LCD projector, Flip charts, Marker pens	30 minutes
2	Group work	Students, split into groups, are given a structured task on obtaining information on one important aspect of the History of Medicine (example – evolution of the germ theory of medicine, discovery of vaccines,...etc) Small group discussion and reflection Presentation by groups and discussion	History of Medicine hand outs	3 hours
3	Alternate systems of Medicine	lecture/ interactive discussion to address the following questions <ul style="list-style-type: none"> • What is Alternative Medicine? • What is Complementary Medicine? • What is Evidence Based Medicine? • What is the difference between Modern Medicine and Complementary and Alternative Medicine (CAM)? • What is the practice impact? 	LCD projector, Flip charts, Marker pens	1 hour
4	Wrap up	Summation and learning points		10 minutes

Assessment: General feedback about the usefulness of the session for future planning

IMG roles / overview of MBBS curriculum and various career pathways

It is important for medical students at entry to have an overview of the curricular framework and the expected learning outcomes from them. It is very important for them to know their career path and the road ahead

The objectives

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

- Comprehend the overall Goal and outcomes of the MBBS program
- Reflect on the various Roles of the Indian Medical Graduate
- Discuss the structure of the MBBS program
- Recognise the various career pathways that are available for their Career growth

Table 6. Methodology for IMG roles / overview of MBBS curriculum and various career pathways

No	Sub Session	Methods	Requirements	Time
1	GMR 2019	Lecture/ interactive discussion about the salient features of the GMR 2019 <ul style="list-style-type: none"> ● Explain the MBBS curriculum, its structure, outcomes and curricular requirements for course completion and program certification 	LCD projector, Flip charts, Marker pens GMR 2019 handouts	1 hour
2	Panel discussion	A panel of specialists and physicians from diverse career pathways <ul style="list-style-type: none"> ● Discuss the opportunities for the students followed by a question answer session. This could be done by the Alumni from various career back grounds		2 hour
3	Wrap up	Summation and learning points		10 minutes

Assessment: General feedback about the usefulness of the session for future planning

Principles of family practice

The students need to be provided a basic understanding of the concept of family practice and holistic care. It is also important for the student to understand the role of the family practitioner in the health system, the role they could play at the various levels of health care.

Objectives:

At the end of this session, the student will be able to:

1. Discuss the principles of family practice and holistic care
2. Describe the role of the physician in the health care system

Table 7.Methodology Principles of family practice

No	Sub Session	Methods	Requirements	Time
1	Principles of family practice and holistic care	<p>Lecture/ interactive discussion about the ten principles of family practice:</p> <ul style="list-style-type: none"> ● Caring ● Clinical Competence ● Cost-effectiveness ● Continuity of care ● Comprehensive care ● Common problems management expertise ● Community based care and research ● Counseling and Communication skills ● Continuing Medical Education (CME) Depending on available time the session may be preceded by either an appropriate case vignette or ● a visit to a family practitioner 	<p>LCD projector, Flip charts, Marker pens</p> <p>Case vignette or a visit to a family practitioner</p>	1 hour

Assessment: Formative: Reflective writing

Skills

The fresh undergraduate student should be aware of some basic principles of Hospital safety and trained in certain basic skills that are mandated before they enter patient care areas. These are a part of quality initiatives to ensure patient and physician safety.

BLS and First Aid

New entrants into medical fraternity should have a basic understanding of resuscitation and first aid skills.

The Basic Life Support (BLS): CPR provider training is designed to provide the students with foundational knowledge and skills needed to perform cardiopulmonary resuscitation (CPR) and other lifesaving skills. The first-aid component of this course addresses additional circumstances and diseases that may require intervention and assistance before the patient is transferred to emergency medical services.

Objectives:

At the end of this session, the student will be able to:

1. Perform adequate chest compressions, deliver adequate ventilations in adults and children and appropriately use of an Automated External Defibrillator (AED).
2. Recognize and initiate first aid for several life threatening emergencies.

Universal Precautions (UP) Objectives:

At the end of this session, the student will be able to:

1. Define Universal Precautions
2. List essential components of Universal Precautions
3. List infective and non- infective body fluids –
4. Demonstrate correct techniques of Hand washing, gloving/degloving, disinfection, handling sharps, waste disposal

Table 8.Methodology for Universal Precautions (UP)

No	Sub Session	Methods	Requirements	Time
1	Definition of Universal Precautions (UP)	<p>Interactive lecture about:</p> <ul style="list-style-type: none"> ▪ Definition of UP ▪ Essential components of UP ▪ Infective and non-infective body fluids (may use a drill to recap) 	LCD projector, Flip charts, Marker pens	1 hour
2	Interactive practical demonstration	<ul style="list-style-type: none"> ▪ Divide the students into groups of not more than 10 per group. <p>There should be one faculty per group who will conduct an interactive practical demo about</p> <ul style="list-style-type: none"> ▪ Use of hand rub ▪ Gloving and de-gloving <p>The students will be then allowed to demonstrate the correct method and receive feedback</p>		2 hour
3	Wrap up	Summation and learning points		10 minutes

Assessment: Formative assessment, OSCE Waste management

Objectives:

At the end of this session, the student will be able to:

1. Define biomedical waste
2. Explain the hazards of improper disposal of biomedical wastes
3. Describe the different types of waste generated in a health care facility
4. Explain how one should segregate waste
5. Explain how one should dispose biomedical wastes
6. Methodology

Table 9. Methodology for waste Management

No	Sub session	Methods	Requirements	Time
1	Definition of BMW	Interactive lecture about: <ul style="list-style-type: none">▪ Definition of biomedical wastes▪ Different types of waste generated in a health care facility)▪ Segregation and disposal of waste	LCD projector, Flip charts, Marker pens	1 hour

Assessment: Students may present a reflection of their observation, OSCE on BMW segregation

Immunization

The students should be sensitised to the occupational exposure and the need for protection and safety. During this session, it's important to review the immunisation status of the students and also ensure compliance to the requirements.

Objectives:

At the end of this session, the student will be able to:

1. List the vaccine-preventable diseases(VPD)
2. Explain why vaccination is important for staff and students
3. Describe the vaccination recommendation for health care personnel (Hepatitis B, Chicken pox etc.)

Table 10.Methodology for Immunization

No	Sub Session	Methods	Requirements	Time
1	Vaccine-preventable diseases and recommendations for health care personnel	Interactive lecture about: <ul style="list-style-type: none">• What are vaccine-preventable diseases (VPD)?• Why is vaccination important for staff?• VPDs in healthcare• Recommendation for health care personnel (Hepatitis B, Chickenpox)	LCD projector, Flip charts, Marker pens	1 hour

Assessment: Formative assessment, short notes, Viva in summative assessments

Documentation

The students in the first year should be introduced to the importance of “Documentation” in patient care. They should learn the method of appropriate documentation and understand its significance in patient and employee safety.

Objectives

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

- Explain the importance of documentation as a physician responsibility
- Discuss the consequences of appropriate and inappropriate documentation on patient and employee safety
- Observe the correct method of documentation in patient record
- Reflect on the process

Method: Large group session that gives an overview and demonstrates the documentation process and explains the right and wrong ways.

- The students can be asked to do mock audit and discuss on patient records (dummy records) with a check list. Small group sessions with peer interaction to guide the new students on the process.

Assessment: Formative assessment

Community Orientation Module

National Health goals and policies/ health care systems / community health

The medical student should be exposed from the beginning to the community in order to get a bird's eye view of the social, demographic, environmental and cultural factors that influence health and the system of health care delivery at the primary level of health care.

Objectives:

At the end of this session, the student will be able to:

1. Explain the National Health goals and policies
2. Discuss the National health scenario, demographic, socio-cultural and epidemiological issues
3. Discuss the health care systems in India with reference to primary, secondary and tertiary level care
4. Describe the basic principles of community health and its impact on Health and disease
5. Observe the structure and functioning of the community health centre
6. Reflect on the observation

Table 11. Methodology for National Health goals and policies

No	Sub Session	Methods	Requirements	Time
1	National Health: goals and policies	Interactive lecture on National health goals and policies	LCD projector, Flip charts, Marker pens	1 hour
2	National health scenario	Interactive lecture on National health goals and policies	LCD projector, Flip charts, Marker pens	1 hour
3	Health care systems in India	Community Health Centre visit and reflection on the experience with particular reference to:	Logistics for community visit	4 hours
4	Principles of community health	A) Levels of health care in a community setting B) Interaction with families in the community setting and the impact of health		

5	Community Health Center	C) Functioning of the Community Health Centre and health care and the impact of health team Community visit followed by a discussion back in the college	
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Assessment: Formative: Reflection writing / discussion of the experience

Interactions with patients and families and communities.

Exposure to the community in the beginning of their profession will sensitize the students to the actual community living of people, the disease impact in the community and its impact on the patient’s families and health workers

Objectives:

At the end of this session, the student will be able to demonstrate an understanding of:

1. The effect of family and social environment in the aetiology of diseases
2. Community beliefs and practices related to health and illnesses
3. The environmental health problems in the community
4. Patient experiences to diseases treatment-seeking practice

Assessment: Formative: Reflection writing / discussion of the experience

Table 12. Methodology for Interactions with patients and families and communities

No	Sub Session	Methods	Requirements	Time
1	Interaction with patients and families and communities.	<ul style="list-style-type: none"> ● Community Health centre visit and reflection on the experience with particular reference to: <ul style="list-style-type: none"> ● The effect of family and social environment in the a etiology of diseases <p>Community beliefs and practices related to health and illnesses</p> <ul style="list-style-type: none"> ● The environmental health problems in the community ● Patient experiences to diseases treatment- seeking practice ● Community visit followed by a discussion back in the college 	<p>Logistics for community visit</p> <p>LCD projector, Flip charts, Markers</p>	1 hour (The time for community visit is factored in the previous session)

Assessment: Formative: Reflective writing of their observations

Professional Development and Ethics
Concept of Professionalism and Ethics

The students should be introduced to the concept of professionalism and ethics as an important domain in their learning and practice. They should be made aware of the code of conduct and its significance in life and career.

Objectives:

At the end of this session, the student will be able to:

1. Explain the concept of professionalism and ethics among health care professionals
2. Describe the consequences of unprofessional and unethical behavior

Table 13. Methodology for Professional Development and Ethics

No	Sub Session	Methods	Requirements	Time
1	Professionalism and Ethics – the concept	<ul style="list-style-type: none"> • Interactive lecture about using case vignettes and video • Could use a drill with various scenarios depicting professional and unprofessional behaviour 	LCD projector, Flip charts, Marker pens	1 hour
2	Consequences of unprofessional and unethical behavior	<ul style="list-style-type: none"> • Group work using case vignettes /video • Group presentation and discussion with reference to consequences of unprofessional and unethical behavior 		1 hour

Assessment: Formative assessment

White coat ceremony

FC 4.2	Demonstrate understanding that compassion, altruism, integrity, duty, responsibility and trust are the core values that defines the nature of the physician's work	K	KH
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Objective:

At the end of the session, the student is able to:

1. Appreciate the significance of White Coat Ceremony

The white coat reminds physicians of their professional duties, as prescribed by Hippocrates, to lead their lives and practice their art in uprightness and honour. The white coat is a symbol of our profession.

The White Coat Ceremony is a rite of passage, welcoming the new medical students into the medical profession. As medical students, they are bound by the same professional commitments that bind all physicians. This ceremony will join the symbol of the white coat with the virtues of altruism, responsibility, duty, honour, respect, and compassion.

Assessment: Reflections

Professional and altruistic behavior Objective

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

- Describe Altruism
- Discuss Altruism as an important professional virtue of physician

1	Altruism as a virtue of a Physician	<ul style="list-style-type: none"> • Guest lecture / Address by the dean or director • Case based interactive lecture 	LCD projector, Flip charts, Marker pens	1 hour
2	Case discussion	<ul style="list-style-type: none"> • The students will discuss case in-groups 		1 hour

Assessment: Formative assessment while discussing in groups

Working in a health care team

One of the major roles of the Indian Medical Graduate is that of being a member of a health care team. While the MBBS program is structured to build this competence during its course, an introduction to the concept of working in a team is essential at the beginning.

Objectives:

At the end of this session, the student will be able to:

1. Describe the significance of working in a health care team
2. Discuss the role of honesty ,respect and trust

Table 14.4. Methodology Professional Development and Ethics: Working in a health care team

No	Sub Session	Methods	Requirements	Time
1	Working in a health care team	<ol style="list-style-type: none"> 1. The students visit several patient care area and observe functioning of the Multidisciplinary teams, such as the emergency OPD, or OT, or labour room 2. The students may be posted in small groups to observe and reflect with regard to the 5 important aspects of working in a team: <ol style="list-style-type: none"> a. Shared goals b. Communication c. Leadership d. Role clarity e. Trust /respect 3. Group presentation and discussion 	LCD projector, Flip charts, Marker pens	1 hour

Assessment :Formative assessment during group discussions /presentations

Disability competencies

As newly joined medical students, they need to recognize the importance of various deviations from majority that are happening in human life. Disability is part of human diversity. Differently abled individuals need to be understood and recognized by any stream that deals with human life.

India was one of the first major country who ratified the greatest human rights instrument of 21st Century, the United Nations Convention on the Rights of Persons with Disabilities (CRPD) and accordingly amended its disability legislation incorporating human rights approach to Rights of Persons with Disabilities (RPDA) Act, 2016. The Act mandates inducting disability content into all professional courses including medical field.

Educational Strategy:

An Indian Medical Graduate is expected to have disability competence which is the skills and attributes essential to provide quality health care to patients with disabilities. It is the social responsibility of medical institutions to be empathetic towards the marginalized section. Disability competencies and suggested teaching-learning methods are provided in table2.

Cultural competence

Cultural competence is the ability to interact respectfully with colleagues from any culture and requires critical consciousness. It is a congruent set of behaviors, attitudes, skills, policy and procedures that come together in a system, agency, or among individual professionals to enable them to work effectively in cross cultural situations. This is relevant for the medical students as they are joining MBBS in medical colleges throughout all states in India and students from outside India are also joining medical colleges in India. Therefore, the cross cultural component will help students a lot as the cultural diversity is unique and vast in the country.

Objectives:

At the end of this session, the student will be able to:

1. Describe components of cultural competence

Table 15. Methodology Professionalism and Ethics Module: Cultural competence

No	Sub Session	Methods	Requirements	Time
1	Components of cultural competence	<ul style="list-style-type: none"> An interactive lecture on the components 	LCD projector, Flip charts, Marker pens	1 hour

Stress management

The first year students are challenged with many changes including the new place, peers, atmosphere, environment and a major leap in the learning styles and contents. This induces stress making them vulnerable. Hence, it is important to address the role of stress during their learning period and methods to enhance their resilience.

Objectives

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

- Describe the situation that may cause stress during their learning period
- Discuss the health impact of stress
- Appreciate the various stress management techniques including yoga and meditation
- Discuss the spectrum of risk - taking behaviour, consequences and ways to manage

Case based discussion to be held in small groups on stressful situations such, academic stress, examination stress, peer pressure, family pressure,

Table 16. Methodology for Professional Development and Ethics Module: Time management

No	Sub Session	Methods	Requirements	Time
1	Importance of time management	<ul style="list-style-type: none"> An interactive lecture 	LCD projector, Flip charts, Marker pens	1/2 hour
2	Prioritization	<ul style="list-style-type: none"> Group work using the “action priority matrix” Discussion 		1 hour
3	Distractions and Interruptions	<ul style="list-style-type: none"> Administer the time management skills questionnaire Students to reflect their own strengths Ask students to work in groups and write-down what they think are the main distractions / interruptions that a MBBS student will face. Ask the groups to discuss and present the solutions to the above 		1 hour
4	Wrap up	<ul style="list-style-type: none"> Summarize and take general feedback about the session 		5 minutes

Assessment: Formative

Interpersonal relationship

The students should understand the role of interpersonal relationship while interacting with the patients, families, peers, superiors and health care personnel. They should understand the significance of these interactions and professional boundaries. They should understand and experience the role of mentoring in personal and professional growth.

Learning method:

- (1) Role plays to understand the significance of interpersonal relationship and group discussion
- (2) Interactive lecture on Mentoring followed by allotment of mentors to the new batch
- (3) Mentor-Mentee interaction and road ahead

Learning

After years of formal schooling, students enter the MBBS course often without having mastered the fundamental skills of learning. When they begin their course and are propelled into a more active learner mode, understanding of these fundamentals becomes vital. Students will learn how to learn through many avenues, such as modeling, curiosity, and situational need. This session on learning is included in the Foundation Course as a way to help them understand the process learning.

Objectives:

1. To recognize the need to learn
2. To identify and maximize one's learning style
3. To describe how people learn
4. Experience collaborative and group learning
5. Discuss the methods of SDL and its application in their routine learning Learning method
 - Students are subjected learning style evaluation and asked to reflect
 - Students are exposed to various methods through self -experience and role play and asked to reflect

Assessment: **Nil**

6. Early Clinical Exposure

Early Clinical Exposure (ECE) provides a clinical context and relevance to basic sciences learning. It also facilitates early involvement in the healthcare environment that serves as motivation and reference point for students, leading to their professional growth & development.

Introduction:

Students require context to understand basic sciences. They also require grounding in human and social aspects of the practice of medicine. Early clinical correlation and exposure to clinical environment will provide a point of reference and relevance to the novice learner. The ECE program in the MBBS curriculum tries to create an opportunity for students to correlate learning in Phase I subjects with their clinical application. Learning of basic sciences with respect to a clinical context can improve student's motivation to learn and also improve retention. It also provides authentic human context and early introduction to immersion into the clinical environment. The MBBS curriculum has therefore been modified such that clinical exposure can be introduced earlier along with the basic sciences. Students will be able to learn the basic and clinical sciences by means of integrating learning activities, like early clinical contact, clinical skills, communication skills or task- based learning sessions

Implementation of Early Clinical Exposure Formation of ECE committee

In order to implement ECE in phase 1 medical students, ECE committee will be formed by the Dean, MGMCRI. ECE core committee will include ECE coordinator and ECE incharge from the three preclinical departments and clinical departments which includes faculty representing general medicine, general surgery, pulmonary medicine, obstetrics & gynaecology and paediatrics.

Selection of modules

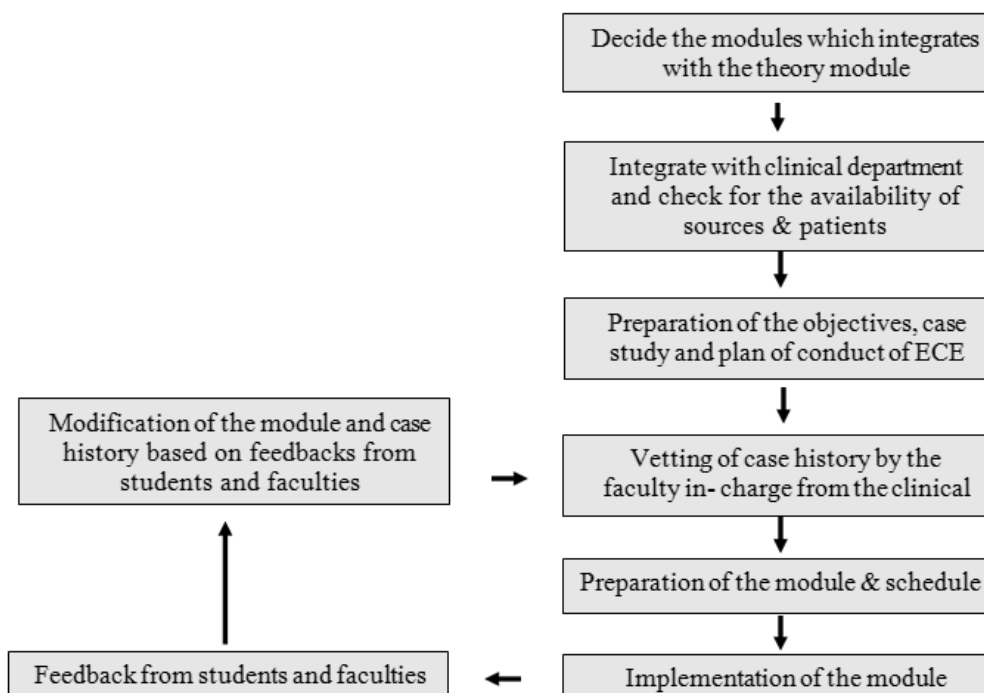
Ten modules will be selected for early clinical exposure from each preclinical department. The topics will be selected such that there is integration with the ongoing theory module during that time period. The topics from each system which has important applied aspects and clinical applications will be chosen. After selection of topics, case scenarios will be written by the faculty in coordination with ECE incharge of integrating clinical department. These clinical scenarios will be selected considering the availability of patients in the wards and feasibility of smooth conduct of ward visits. Each ECE session will be planned for 3 hours. Ten modules will be planned such that, 6 modules will be basic science correlates and

4 modules with scope of learning clinical skills.

Tentative plan of modules for ECE

Module No	Topic	Clinical/Basic science correlation	Integrating Department
Anatomy			
1	Rotator cuff injury	Clinical Skills	Orthopaedics
2	Carcinoma breast	Clinical Skills	General Surgery
3	Varicose veins	Clinical Skills	General Surgery
4	Inguinal canal	Clinical Skills	General Surgery
5	Portal Hypertension	Clinical Skills	General Medicine
6	Broncho pulmonary segments	Basic science correlation	Physiology, Pulmonary medicine
7	Cholecystitis	Basic science correlation	Biochemistry, General Surgery
8	Bell's palsy	Basic science correlation	General Medicine
9	Extraocular Muscle	Clinical Skills	Ophthalmology
10	Thyroid gland	Basic science correlation	Physiology and Surgery
Physiology			
1	Dehydration	Clinical Skills	General Medicine General Surgery Paediatrics, Orthopaedics
2	Blood Transfusion	Clinical Skills	Blood Bank General Medicine General Surgery Paediatrics, Orthopaedics
3	Myasthenia gravis	Basic science correlation	General Medicine
4	Bronchial Asthma	Basic science correlation	General Medicine Pulmonary Medicine
5	Abnormal ECG	Clinical Skills	General Medicine
6	Hypertension	Clinical Skills	General Medicine

7	Renal Dialysis	Clinical Skills	Nephrology
8	Syndromic approach to anterior pituitary	Basic science correlation	General Medicine
9	Hemiplegia	Clinical Skills	General Medicine
10	Obesity and metabolic syndrome	Basic science correlation	General Medicine
Biochemistry			
1	Cystinuria	Basic sciences correlation	General Medicine
2	Nephrotic syndrome	Clinical skills	Pediatrics
3	Myocardial infarction	Basic sciences correlation	General Medicine
4	Multiple myeloma	Basic sciences correlation	General Medicine
5	Type 2 Diabetes mellitus (Diabetic foot)	Clinical skills	General Medicine General Surgery
6	Obesity	Basic sciences correlation	General Medicine Pediatrics
7	Acid base disorders	Basic sciences correlation	General Medicine
8	Jaundice	Clinical skills	General Medicine General Surgery Pediatrics
9	Chronic renal failure	Clinical skills	General Medicine Nephrology
10	Rickets	Basic sciences Correlation	General Medicine Pediatrics



Preparation of lesson plan

A model lesson plan will be prepared for the first topic and the structure will be discussed in the sub curricular committee and will be finalised with the Vice principal curriculum and Dean. The lesson plan for each topic will be prepared well before the commencement of ECE module by the ECE incharge of pre-clinical departments. This lesson plan along with the case study will be sent to the ECE incharge and HOD of the integrating clinical department for vetting and finalising. The lesson plan will then be compiled by the ECE Coordinator.

Conduct of ECE

250 phase 1 MBBS students will be divided into three batches(Batch A, B and C) consisting of 83 or 84 students in each batch and will be sent to anatomy, physiology and biochemistry. For three weeks, each batch will be sent in rotation of each preclinical department. Hence, it takes three weeks to complete one module. A common schedule of conduct of ECE will be made by the ECE coordinator and circulated to the preclinical and integrating clinical departments. During each ECE session, the students in each preclinical department will be further divided into small groups to enhance small group discussion of case scenarios.

A common structure planned for the conduct of each ECE module

Introduction	30 mins
Clinical Experience/Demonstration	1 hour 30 minutes
Summary & Conclusion	30 minutes
Reflection& Feedback	30 minutes

Feedback of each session

At the end of each session, feedback was obtained from students through online link. Based on the feedback of students, modification in the conduct of ECE was considered and implemented. Feedback from teachers will also be obtained for better planning and implementation of the program.

Assessment

A formative assessment test will be conducted at the end of each module. Questions will be included in the formative assessments and internal assessment tests from ECE topics. OSPE charts from ECE topics will be included in practical internal assessment tests.

**ATTITUDE, ETHICS
& COMMUNICATION (AETCOM)
COMPETENCIES**

Learning modules for Professional year I

Number of Modules: 5

Numbers of hours 34

7. Attitude, Ethics & Communication (AETCOM) Competencies

Module 1.1: What does it mean to be a doctor? Background

It is important for new entrants to get a holistic view of their profession, its ups and downs, its responsibilities and its privileges. It is important to start this discussion early in their careers when their minds are still fresh with the thrill of joining medical school. Such a discussion will help them remember the big picture through the program and remind them why they have chosen to be doctors.

Objectives

The student should be able to:	Level
1. Enumerate and describe professional qualities and roles of a physician	KH
2. Describe and discuss the commitment to lifelong learning as an important part of physician growth	KH
3. Describe and discuss the role of a physician in health care system	KH
4. Identify and discuss physician's role and responsibility to society and the community that she/ he serves	KH

Learning experience

Sub competencies:	Duration	T/L method
Professional qualities and roles of a physician	2 hrs.	LGT: Interactive Lecture
	OFF hours	Movie
Commitment to lifelong learning	2 hrs.	Panel discussion
Role of a physician in health care system	2 hrs.	Elocution competition
	OFF hours	Movie
Physician's role and responsibility to society and the community.	2 hrs.	Poster competition on, what it means to be a doctor'?

Assignment

- Reflective writing for each session in AETCOM log book

Assessment

- **Formative:** Not required
- **Summative:** Not required

Resources for self-directed learning

1. Whitcomb ME. What does it mean to be a physician? Acad Med.2007; 82:917-8.
2. Eisenberg C. It is still a privilege to be a doctor? N Engl J Med 1986;314:1113-1114.
3. Ofri D. Neuron overload and the juggling doctor. The Lancet 2010; 376: 1820 –21.

Module 1.2: What does it mean to be a Patient? Background

Doctors deal with human suffering throughout their professional careers. A balanced approach to the patient care experience requires an understanding of patients, illnesses, their concepts of suffering, coping mechanisms, the role of the doctor, an exploration of empathy vs equanimity and the difference between healing and curing. An introduction to this fundamental but complex field is important in the first Professional year. An introductory experience will allow students to keep the patient experience in perspective during their learning.

Objectives

The student should be able to:	Level
Enumerate and describe professional qualities and roles of a physician	KH
Demonstrate empathy in patient encounters	SH

Learning experience

Sub competencies:	Duration	T/L method
Enumerate and describe professional qualities and roles of a physician	2hrs.	Exploratory session with the students asking them to do a narrative writing / oral regarding their views on health, disease and suffering.
Demonstrate empathy in patient encounters	2hrs.	Hospital visit in small groups to interact with the patient under supervision.
	2hrs.	Video display followed by Audio play of, 'When breath becomes air' (Self Directed Learning session)
	2hrs.	Students will Reflect either verbally or in writing on 'What does it mean to be a Patient?'

Assignment

- Reflective writing for each session in AETCOM log book

Assessment

1. **Formative:** The student may be assessed based on their active participation and presentation (written and oral).
2. **Summative:** SAQ

Module 1.3: The doctor-patient relationship Background

The doctor-patient relationship is the cornerstone to effective patient care. This session builds on the previous two sessions which address doctors and patients and attempts to explore the fundamental basis of the doctor-patient contract, its rules, boundaries and duties. It provides an introduction to the nature of relationship, importance of communication, honesty, transparency, shared responsibility, equality and vulnerability. This introductory session, though complex, will provide an overview for the student to provide them with a perspective on the doctor-patient relationship throughout their years of study.

Objectives

The student should be able to:	Level
Enumerate and describe professional qualities and roles of a physician	KH
Demonstrate empathy in patient encounters	SH

Learning experience

Sub competencies:	Duration	T/L Methods
Enumerate and describe professional qualities and roles of a physician	2hrs.	Interactive large group teaching
Demonstrate empathy in patient encounters	2hrs.	Video on doctor patient relationship. ((Self Directed Learning session))
	2hrs.	Case discussion
	2hrs.	Reflective sessions on The doctor-patient relationship.

Case for discussion Case 1:

A 53 year old man is seen by a cardiologist for chest pain lasting for a few minutes on accustomed exercise for the past 3 weeks. After a detailed history and physical examination, the doctor orders an ECG which was normal. He further orders an exercise stress test which showed reversible ischemia. The doctor orders an angiogram. At the time, the patient requests that he would like to have a second opinion. The cardiologist explains that he has

done everything correctly and that the patient indeed requires an angiogram. The patient tells him that he cannot make a decision unless he talks to his family doctor of 20 years. The cardiologist is offended and tells the patient that he does not wish to see the patient any longer.

Points for discussion:

- a) Trust in the doctor-patient relationship.
- b) Rights of a patient, Duties of a doctor.
- c) Does the request for a second opinion provide sufficient grounds to terminate the doctor-patient relationship?

Case 2:

A young doctor has been taking care of an 86 year old woman for the past 2 years. She had a fall 2 years ago and has been mostly bed ridden. She lives alone with just a care taker and her children are abroad. She requires preventive care mostly and the doctor makes house visits once a week. The doctor spends time talking to her during each visit and makes her feel comfortable. One day during such a visit, the patient expresses the view that her children have been ungrateful to her and that she intends to call her lawyer today and divide her assets between the doctor and the caretaker after her death. What should the doctor do?

Points for discussion:

1. Boundaries in the doctor-patient relationship.
2. Trust and vulnerability in doctor-patient relationship.

Assignment

- Reflective writing for each session in AETCOM log book

Assessment

- **Formative:** The student may be assessed based on their active participation in the sessions. A written critique of the situations discussed in item 2 may be used for formative assessment.
- **Summative:** Short questions for example a) rights of patients, b) responsibilities of patients, c) duties of doctors, and d) boundaries of the doctor-patient relationship.

Resources for cases

- AMA Code of Medical Ethics: https://www.ama-assn.org/delivering_care/ama-code-medical-ethics (for case1)
- https://www.dovepress.com/getfile.php_file_ID=1351 (for case2)

Resources for self-directed learning

<http://www.cpso.on.ca/policies-publications/the-practice-guide-medical-professionalism-and-col/principles-of-practice-and-duties-of-physicians>

Module 1.4: The foundations of communication - 1 Background

Communication is a fundamental prerequisite in the medical profession and bedside clinical skills is crucial in ensuring professional success for doctors. This module provides students with an introduction to doctor-patient communication. The Kalamazoo consensus statement¹ provides a working model of teaching communication skills and may be used to impart communication skills. The five „A’s elements of behavior change model may also be used. Effective listening, verbal and nonverbal communication and creating respect in patient encounters would be the skills that would be introduced.

Objectives

The student should be able to:	Level
Demonstrate ability to communicate to patient in a patient, respectful, nonthreatening ,non-judgemental, and empathetic manner	SH

Learning experience

Sub competencies:	Duration	T/L Methods
Demonstrate ability to communicate to patients in a patient, respectful, nonthreatening, non- judgmental and empathetic manner	2hrs	Interactive large group teaching
	2hrs	Role play involving students
Techniques of Effective communication	2hrs	Videos display on doctor patient communication / and Reflective writing on doctor patient communication

Assignment

- Reflective writing for each session in AETCOM log book

Assessment

- **Formative:** The student may be assessed based on their active participation in the sessions. A written critique of the situations discussed in item 3 may be used for formative assessment.
- **Summative:** may be deferred for later phases.

Resource:

- Makoul G. Essential elements of communication in medical encounters: the Kalamazoo consensus statement. Acad Med. 2001; Apr; 76(4):390-3.

Module 1.5: The cadaver as our first teacher Background

Medical students enter college and their first and lasting encounter is with the cadaver. Respect for cadaver as a teacher translates later into respect for human beings as teachers and a lifelong respect for learning. Throughout the world the emphasis on “humanizing” the cadaver with respect as first patient or first teacher has gained momentum.

Objective

The student should be able to:	Level
Demonstrate respect and follows the correct procedure when handling cadavers and other biologic tissues	SH

Learning experience

Sub competencies:	Duration	T/L Methods
Demonstrate respect and follows the correct procedure when handling cadavers and other biologic tissues	2hrs.	Interactive large group teaching
	2hrs.	Closing session with reflective writing

Assignment

- Reflective writing for each session in AETCOM log book

Assessment

- **Formative:** The student may be assessed based on their active participation in the sessions. The respect and the manner in which students handle biologic tissues throughout the phase may be part of the overall formative assessment of the student.
- **Summative:** may not be required. Resource:

<http://medicine.yale.edu/education/donation/reflections/> (An example of the project is found here).

9. MBBS Curricular Mapping

Table 17 (a). Mapping of PEO & PO

Program Educational Objective	Program outcome	Assessment
<p>PEO1.Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.</p>	<p>At the end of the 5 ½ years of training IMG of MGMCRI should be able to</p> <p>PO1.Perform the duty of a general physician</p> <p>PO2.Gather a history and perform a physical examination</p> <p>PO3.Prioritize a differential diagnosis following a clinical encounter.</p> <p>PO4.Recommend and interpret common diagnostic and screening tests</p> <p>PO5.Enter and discuss orders and prescriptions</p> <p>PO6.Document a clinical encounter in the patient record</p> <p>PO7.Recognize a patient requiring urgent or emergent care and initiate evaluation and management.</p>	<p>Formative assessment at regular interval during the course.</p> <p>Summative assessment at the end of each phase</p> <p>OSCE at the end of each phase</p> <p>Exit OSCE at the end of CRRI</p>
<p>PEO2.Leader and member of the health care team and system with capabilities to collect analyze, synthesize and communicate health data appropriately.</p>	<p>Should be able to</p> <p>O8.Collaborate as a member of an interprofessional team.</p>	

<p>PEO3. Communicator with patients, families, colleagues and community.</p>	<p>Should be able to</p> <p>PO9. Communicate effectively and appropriately with patient and their families, colleagues and other health care members, and other stake holders in the community.</p>	
<p>PEO4.Lifelong learner committed to continuous improvement of skills and knowledge.</p>	<p>Should be able to</p> <p>PO10.Form clinical questions and retrieve evidence to advance patient care.</p>	
<p>PEO5.Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.</p>	<p>Should be able to</p> <p>PO11.Give or receive a patient handover to transition care responsibility</p> <p>PO12. Obtain informed consent for tests and/or procedures.</p> <p>PO13. Identify system failures and contribute to a culture of safety and improvement</p>	

Table 17 (b). Mapping of PO & CO

Program outcome	Phase	Course outcome	Domain	Level	Assessment
PO1. Perform the duty of a general physician	Phase I Phase II Phase III (1) Phase III (2) M&A Phase III (2) S&A	AN1-7/ BI1-8 /PY 1-6 MI 1-8 / PH1-12/PA1-10/FM 1-10 CM1-10/OPI-6/EN1-7 GM1-8/AS 1-6/PS1,4-7 /PE 1-7/DR1-8/CT1-11 GS1,3-6,8/OG 1-15/OR1-6/RD1-9	K/S/A	K/KH/S/SH	Written test /Bedside / History -OSCE
PO2. Gather a history and perform a physical examination.	Phase I Phase II Phase III (1) Phase III (2) M&A Phase III (2) S&A	AN 1,3,7/ BI 2,5,6 / PY 1-6 PH5/PA1,4,6,7/FM 4,5 CM2-6,8/OPI-3,5/EN1-3 GM1,2,4,5,7,8/AS1-3,5,6/PS2-9/PE 1,2,4,5,7/DR2-7/CT1-6,8-11 GS1,4-6,8/OG2, 13/OR1,3,4/RD4-6,8	K/S/A	K/KH/S/SH	Bedside/Mini- CEX/DOPS/OSC E
PO3. Prioritize a differential diagnosis following a clinical encounter.	Phase I Phase II Phase III (1) Phase III (2) M&A Phase III (2) S&A	AN 3,7/ BI4-6 /PY 1-6 MI 1-3,5/PA1,2,4,6-8,10 CM 2-6,8/OP1-3/EN2,3 GM1,3,5,7,8/AS1-6/PS2-6,8,9/PE1,2,4/DR2-7/CT2,3,9 GS1,2,4-6/OG 2, 13/ OR1,3,4/RD2-6	K	K/KH	Scenario-based Question/DOPS
PO4. Recommend and interpret common diagnostic and screening tests.	Phase I Phase II Phase III (1) Phase III (2) M&A Phase III	AN 2,3,5,6/ BI 2-6/ PY 3-5, 7 MI 1-5,7,8/PA2,3,8-10 CM 2-6,8/OPI-5/EN2-4 GM1-5,7,8/AS1-5/PS1-6,9/PE 1-4,7/DR2-	K	K/KH	Written test /OSPE

	(2)S&A	7/CT1,4,5,9-11 GS2,3,5/OG 10,11/ OR1,3,4/RD1-4,6-8				
PO5. Enter and discuss orders and prescriptions rationally.	Phase I Phase II Phase III (1) Phase III (2) M&A Phase III (2) S&A	AN 3-6 /PY 5 MI 5,6/PH9/PA3,6 CM 2-6,8/OP1-3,5/EN2,4 GM1,3,4,7/AS1-3,5,6/PS1-6,9/PE 2-4/DR2,5-7/CT1,6,8,10 GS6/OG1,5,12,14/OR1,3,6/RD4,6	K/S	K/KH/S	Practical/ OSPE	
PO6. Document a clinical encounter in the patient record.	Phase I Phase II Phase III (1) Phase III (2) M&A Phase III (2) S&A	PY5-7 MI 5/PH5/PA1,2,5-7,10 CM 2-6,8/OP1-3,5,6/EN2-4 GM5-8/AS1-7/PS2-4,7-9/PE1-7/DR2-7/CT2,3,5,7-11 GS4/OG 2,5,9,13/ OR1-5/RD8	K/S	K/KH/S	Reflection / Narrative	
PO7. Recognize a patient requiring urgent or emergent care and initiate evaluation and management.	Phase I Phase II Phase III (1) Phase III (2) M&A Phase III (2) S&A	BI 6,7/ PY 1-7 MI 1-8/PH9,12/PA2-4,6-8,10 CM 2-6,8/OP3-6/EN1-3,5,6,GM2-8/AS1,2,4,5/PS1-7/ PE1,2/DR2,5,7,8/CT3,6,7,9,11GS2,6/OG 2,3,6,10,11,13/OR1,5/RD1-4,6,8	K/S/A	K/KH/S/SH	Scenario-based Question/DOPS/MSF	
PO8. Collaborate as a member of an interprofessional team.	Phase I Phase II Phase III (1) Phase III (2) M&A Phase III (2) S&A	AN 3-6 /BI 6,7/ PY 6 MI 4,5/PH5/PA2,4-8 CM 1-6,8/ OP2,4-6/EN2 GM4,5,7,8/AS1-6/PS1-3,10/PE1-7/DR1-5/CT4-11 GS4,6,7/OG 3,4 /OR1,5,6/RD4-6,8	K/S/A	K/KH/S/SH	MSF/DOPS	

PO9. Communicate effectively and appropriately with patient and their families, colleagues and other health care members, and other stake holders in the community.	Phase I Phase II Phase III (1) Phase III (2) M&A Phase III (2) S&A	AN 3,4,6/ PY 6 MI 1-8/PH6/PA2,8/ CM1-8/OP1-9/EN5-7 GM1,4-8/AS2,3,5-7/PS1,9/PE1-7/DR1,2,4,7,8/CT1-11 GS4,7/OG 1,3,5,8,9 / OR1-6/ RD4-6,8	K/S/A	K/KH/S/SH	MSF/DOPS/ Kalamazoo Scale
PO10. Form clinical questions and retrieve evidence to advance patient care.	Phase I Phase II Phase III (1) Phase III (2) M&A Phase III (2) S&A	BI 7/ PY 5-7 MI 1-8/PA1,2,6-10 EN1-4 GM1-5,7,8/AS1-5/PS2,3 /PE2,4/DR3,5,8/CT2,7,9 GS4,8/OG 2,10,11,13/ OR1-4/RD4,6,7	K/S	K/KH/S/SH	Bedside/Mini- CEX/MSF
PO11. Give or receive a patient handover to transition care responsibility.	Phase II Phase III (1) Phase III (2) M&A Phase III (2) S&A	MI 4/PA3,7,8 OP3,6/EN2 GM3-5,7,8/AS 2,3,5,6 /PS2,3 /PE2/DR3,4/CT6,7 GS4,6/OG 3,6/ OR1,2,4/RD8	K/S/A	K/KH/S/SH /D	DOPS/OSCE
PO12. Obtain informed consent for tests and/or procedures.	Phase I Phase II Phase III (1) Phase III (2) M&A Phase III (2) S&A	AN 4,5 /PY 6 MI 5 /PA2/FM 1,4,5 CM 2,4-6,8/OP1-6/EN3,6 GM3,4,6-8/AS 7 PE1-4,7/DR4,6-8/CT1,4,58,11 GS5,7/OG9,12/ OR1,2/RD4-7	K/S/A	K/KH/S/SH/OSPE/DOPS D	
PO13. Identify system failures and contribute to a culture of safety and improvement.	Phase I Phase II Phase III (1) Phase III (2) M&A Phase III (2) S&A	BI 8 / PY 5-7 MI 4,5/2,10 CM 3,10/EN5,7 GM3-5,7,8/AS 2-6, 8/PS10 /PE3,6/DR3,5/CT4-8,10,11 GS8/OG 11, 12,16,17/ OR1-6/RD8	K/S	K/KH/S/SH	MSF

10. Syllabus

10.1 Human Anatomy (CODE: AN)

Table 18. Topics and outcomes

Number of topics	Number of outcomes
82	409

Table 19. Teaching hours

Lectures (Hours)	Small Group Teaching/ Tutorials/ Integrated learning/ Practical (hours)	Self-directed learning (hours)	Total (hours)
220	415	40	675

Table 20. Details of Competency, Domain, T-L Methods, Assessment methods, Integration.

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration		
Human Anatomy											
Topic: 1. Anatomical terminology		Number of competencies: (2)								Number of procedures for certification: (NIL)	
AN1.1	Demonstrate normal anatomical position, various planes, relation, comparison, laterality & movement in our body	K/S	SH	Y	Lecture, DOAP session	Written/ Viva voce/skills assessment					
AN1.2	Describe composition of bone and bone marrow	K	KH	Y	Lecture	Written/ Viva voce					
Topic: 2. General features of bones & Joints		Number of competencies: (6)								Number of procedures for certification: (NIL)	
AN2.1	Describe parts, blood and nerve supply of a long bone	K	KH	Y	Lecture, DOAP session	Written/ Viva voce					
AN2.2	Enumerate laws of ossification	K	KH	N	Lecture	Written					
AN2.3	Enumerate special features of a sesamoid bone	K	KH	N	Lecture	Written					
AN2.4	Describe various types of cartilage with its structure & distribution in body	K	KH	Y	Lecture	Written/ Viva voce		Orthopedics			
AN2.5	Describe various joints with subtypes and examples	K	KH	Y	Lecture	Written/ Viva voce		Orthopedics			
AN2.6	Explain the concept of nerve supply of joints & Hilton's law	K	KH	Y	Lecture	Written/ Viva voce					
Topic: 3. General features of Muscle		Number of competencies: (3)								Number of procedures for certification: (NIL)	
AN3.1	Classify muscle tissue according to structure & action	K	KH	Y	Lecture	Written/ Viva voce			Physiology		
AN3.2	Enumerate parts of skeletal muscle and differentiate between tendons and aponeuroses with examples	K	KH	Y	Lecture	Written/ Viva voce					
AN3.3	Explain Shunt and spurt muscles	K	KH	N	Lecture	Written					

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: 4. General features of skin and fascia Number of competencies: (5) Number of procedures for certification: (NIL)									
AN4.1	Describe different types of skin & dermatomes in body	K	KH	N	Lecture, DOAP session	Written			
AN4.2	Describe structure & function of skin with its appendages	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		Dermatology, Venereology & Leprosy	
AN4.3	Describe superficial fascia along with fat distribution in body	K	KH	Y	Lecture, DOAP session	Written/ Viva voce			
AN4.4	Describe modifications of deep fascia with its functions	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		Dermatology, Venereology & Leprosy	
AN4.5	Explain principles of skin incisions	K	KH	N	Lecture	Written		Dermatology, Venereology & Leprosy	
Topic: 5. General features of the cardiovascular system Number of competencies: (8) Number of procedures for certification: (NIL)									
AN5.1	Differentiate between blood vascular and lymphatic system	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN5.2	Differentiate between pulmonary and systemic circulation	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN5.3	List general differences between arteries & veins	K	KH	Y	Lecture	Written/ Viva voce			
AN5.4	Explain functional difference between elastic, muscular arteries and arterioles	K	KH	Y	Lecture	Written/ Viva voce			
AN5.5	Describe portal system giving examples	K	KH	Y	Lecture	Written/ Viva voce			
AN5.6	Describe the concept of anastomoses and collateral circulation with significance of end-arteries	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN5.7	Explain function of meta-arterioles, precapillary sphincters, arterio-venous anastomoses	K	KH	N	Lecture	Written			Physiology
AN5.8	Define thrombosis, infarction & aneurysm	K	KH	N	Lecture	Written		Pathology	Physiology
Topic: 6. General Features of lymphatic system Number of competencies: (3) Number of procedures for certification: (NIL)									
AN6.1	List the components and functions of the lymphatic system	K	KH	N	Lecture	Written			
AN6.2	Describe structure of lymph capillaries & mechanism of lymph circulation	K	KH	N	Lecture	Written			
AN6.3	Explain the concept of lymphoedema and spread of tumors via lymphatics and venous system	K	KH	N	Lecture	Written		General Surgery	
Topic: 7. Introduction to the nervous system Number of competencies: (8) Number of procedures for certification: (NIL)									
AN7.1	Describe general plan of nervous system with components of central, peripheral & autonomic nervous systems	K	KH	Y	Lecture	Written			
AN7.2	List components of nervous tissue and their functions	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN7.3	Describe parts of a neuron and classify them based on number of neurites, size & function	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN7.4	Describe structure of a typical spinal nerve	K	KH	Y	Lecture	Written/ Viva voce			
AN7.5	Describe principles of sensory and motor innervation of muscles	K	KH	N	Lecture	Written		General Medicine	Physiology
AN7.6	Describe concept of loss of innervation of a muscle with its applied anatomy	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN7.7	Describe various type of synapse	K	KH	N	Lecture	Written			Physiology
AN7.8	Describe differences between sympathetic and spinal ganglia	K	KH	N	Lecture	Written			
Topic:8.Features of individual bones (Upper Limb)									
Number of competencies: (6)									
AN8.1	Identify the given bone, its side, important features & keep it in anatomical position	K/S	SH	Y	DOAP session	Viva voce/ Practicals/ OSPE			
AN8.2	Identify & describe joints formed by the given bone	K/S	SH	Y	Lecture, DOAP session	Viva voce			
AN8.3	Enumerate peculiarities of clavicle	K	KH	Y	Lecture, DOAP session	Viva voce			
AN8.4	Demonstrate important muscle attachment on the given bone	K/S	SH	Y	Practical DOAP session, Small group teaching	Viva voce Practicals		Orthopedics	
AN8.5	Identify and name various bones in articulated hand, Specify the parts of metacarpals and phalanges and enumerate the peculiarities of pisiform	K/S	SH	Y	Practical,F9I DOAP session, Small group teaching	Viva voce Practicals			
AN8.6	Describe scaphoid fracture and explain the anatomical basis of avascular necrosis	K	KH	N	DOAP session	Viva voce		Orthopedics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: 9. Pectoral region									
Number of competencies: (3)									
AN9.1	Describe attachment, nerve supply & action of pectoralis major and pectoralis minor	K	KH	Y	Lecture, Practical	Written			
AN9.2	Breast: Describe the location, extent, deep relations, structure, age changes, blood supply, lymphatic drainage, microanatomy and applied anatomy of breast	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	
AN9.3	Describe development of breast	K	KH	N	Lecture	Written			
Topic: 10. Axilla, Shoulder and Scapular region									
Number of competencies: (13)									
AN10.1	Identify & describe boundaries and contents of axilla	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.2	Identify, describe and demonstrate the origin, extent, course, parts, relations and branches of axillary artery & tributaries of vein	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.3	Describe, identify and demonstrate formation, branches, relations, area of supply of branches, course and relations of terminal branches of brachial plexus	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.4	Describe the anatomical groups of axillary lymph nodes and specify their areas of drainage	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	
AN10.5	Explain variations in formation of brachial plexus	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN10.6	Explain the anatomical basis of clinical features of Erb's palsy and Klumpke's paralysis	K	KH	N	Lecture	Written		General Surgery	
AN10.7	Explain anatomical basis of enlarged axillary lymph nodes	K	KH	N	Lecture	Written		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN10.8	Describe, identify and demonstrate the position, attachment, nerve supply and actions of trapezius and latissimus dorsi	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.9	Describe the arterial anastomosis around the scapula and mention the boundaries of triangle of auscultation	K	KH	N	Lecture	Written			
AN10.10	Describe and identify the deltoid and rotator cuff muscles	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.11	Describe & demonstrate attachment of serratus anterior with its action	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN10.12	Describe and demonstrate shoulder joint for– type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements, muscles involved, blood supply, nerve supply and applied anatomy	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Orthopedics	
AN10.13	Explain anatomical basis of Injury to axillary nerve during intramuscular injections	K	KH	N	Lecture	Viva voce			
Topic: 11. Arm & Cubital fossa Number of competencies: (6) Number of procedures for certification: (NIL)									
AN11.1	Describe and demonstrate muscle groups of upper arm with emphasis on biceps and triceps brach	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN11.2	Identify & describe origin, course, relations, branches (or tributaries), termination of important nerves and vessels in arm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN11.3	Describe the anatomical basis of Venepuncture of cubital veins	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	
AN11.4	Describe the anatomical basis of Saturday night paralysis	K	KH	Y	Practical, Lecture	Written/ Viva voce		Orthopedics	
AN11.5	Identify & describe boundaries and contents of cubital fossa	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN11.6	Describe the anastomosis around the elbow joint	K	KH	N	Lecture	Written			
Topic: 12. Forearm & hand Number of competencies: (15)									
Number of procedures for certification: (NIL)									
AN12.1	Describe and demonstrate important muscle groups of ventral forearm with attachments, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.2	Identify & describe origin, course, relations, branches (or tributaries), termination of important nerves and vessels of forearm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.3	Identify & describe flexor retinaculum with its attachments	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.4	Explain anatomical basis of carpal tunnel syndrome	K	KH	Y	Lecture	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN12.5	Identify & describe small muscles of hand. Also describe movements of thumb and muscles involved	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.6	Describe & demonstrate movements of thumb and muscles involved	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.7	Identify & describe course and branches of important blood vessels and nerves in hand	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.8	Describe anatomical basis of Claw hand	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN12.9	Identify & describe fibrous flexor sheaths, ulnar bursa, radial bursa and digital synovial sheaths	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN12.10	Explain infection of fascial spaces of palm	K	KH	N	Lecture	Written		General Surgery	
AN12.11	Identify, describe and demonstrate important muscle groups of dorsal forearm with attachments, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN12.12	Identify & describe origin, course, relations, branches (or tributaries), termination of important nerves and vessels of back of forearm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN12.13	Describe the anatomical basis of Wrist drop	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN12.14	Identify & describe compartments deep to extensor retinaculum	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN12.15	Identify & describe extensor expansion formation	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
Topic: 13. General Features, Joints, radiographs & surface marking									
Number of competencies:(8)									
Number of procedures for certification:(NIL)									
AN13.1	Describe and explain Fascia of upper limb and compartments, veins of upper limb and its lymphatic drainage	K	KH	Y	Lecture	Written/ Viva voce			
AN13.2	Describe dermatomes of upper limb	K	KH	N	Lecture	Written/ Viva voce			
AN13.3	Identify & describe the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements, blood and nerve supply of elbow joint, proximal and distal radio-ulnar joints, wrist joint & first carpometacarpal joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN13.4	Describe Sternoclavicular joint, Acromioclavicular joint, Carpometacarpal joints & Metacarpophalangeal joint	K	KH	N	Lecture	Written			
AN13.5	Identify the bones and joints of upper limb seen in anteroposterior and lateral view radiographs of shoulder region, arm, elbow, forearm and hand	K/S	SH	Y	Practical, Small group discussion, DOAP session	Viva voce/ skill assessment		Radio diagnosis	
AN13.6	Identify & demonstrate important bony landmarks of upper limb: Jugular notch, sternal angle, acromial angle, spine of the scapula, vertebral level of the medial end, Inferior angle of the scapula	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN13.7	Identify & demonstrate surface projection of: Cephalic and basilic vein, Palpation of Brachial artery, Radial artery, Testing of muscles: Trapezius, pectoralis major, serratus anterior, latissimus dorsi, deltoid, biceps brachii, Brachioradialis	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment			
AN13.8	Describe development of upper limb	K	KH	N	Lecture	Written			
Topic: 14. Features of individual bones (Lower Limb)									
Number of competencies: (4)									
AN14.1	Identify the given bone, its side, important features & keep it in anatomical position	K/S	SH	Y	DOAP session	Viva voce			
AN14.2	Identify & describe joints formed by the given bone	K/S	SH	Y	Lecture, DOAP session	Viva voce			
AN14.3	Describe the importance of ossification of lower end of femur & upper end of tibia	K	KH	Y	Lecture	Viva voce/ Practicals		Forensic Medicine & Toxicology	
AN14.4	Identify and name various bones in the articulated foot with individual muscle attachment	K/S	SH	N	Practical, DOAP session, Small group teaching	Viva voce/ Practicals			
Topic: 15. Front & Medial side of thigh									
Number of competencies: (5) &									
AN15.1	Describe and demonstrate origin, course, relations, branches (or tributaries), termination of important nerves and vessels of anterior thigh	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN15.2	Describe and demonstrate major muscles with their attachment, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN15.3	Describe and demonstrate boundaries, floor, roof and contents of femoral triangle	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN15.4	Explain anatomical basis of Psoas abscess & Femoral hernia	K	KH	N	Lecture, DOAP session	Written/ Viva voce		General Surgery	
AN15.5	Describe and demonstrate adductor canal with its content	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
Topic: 16. Gluteal region & back of thigh									
Number of competencies:(6)									
Number of procedures for certification:(NIL)									
AN16.1	Describe and demonstrate origin, course, relations, branches (or tributaries), termination of important nerves and vessels of gluteal region	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN16.2	Describe anatomical basis of sciatic nerve injury during gluteal intramuscular injections	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		General Surgery	
AN16.3	Explain the anatomical basis of Trendelenburg sign	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		General Surgery	
AN16.4	Describe and demonstrate the hamstrings group of muscles with their attachment, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN16.5	Describe and demonstrate the origin, course, relations, branches (or tributaries), termination of important nerves and vessels on the back of thigh	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN16.6	Describe and demonstrate the boundaries, roof, floor, contents and relations of popliteal fossa	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
Topic:17 Hip Joint									
Number of competencies:(3)									
AN17.1	Describe and demonstrate the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles involved, blood and nerve supply, bursae around the hip joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN17.2	Describe anatomical basis of complications of fracture neck of femur	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN17.3	Describe dislocation of hip joint and surgical hip replacement	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
Topic: 18.Knee joint, Anterolateral compartment of leg & dorsum of foot									
Number of competencies:(7)&									
AN18.1	Describe and demonstrate major muscles of anterolateral compartment of leg with their attachment, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN18.2	Describe and demonstrate origin, course, relations, branches (or tributaries), termination of important nerves and vessels of anterior compartment of leg	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN18.3	Explain the anatomical basis of foot drop	K	KH	Y	Lecture, DOAP session	Written/ Viva voce		General Surgery	
AN18.4	Describe and demonstrate the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles involved,	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
	blood and nerve supply, bursae around the knee joint				session				
AN18.5	Explain the anatomical basis of locking and unlocking of the knee joint	K	KH	Y	Small group teaching	Written/ Viva voce			
AN18.6	Describe knee joint injuries with its applied anatomy	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN18.7	Explain anatomical basis of Osteoarthritis	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
Topic: 19.Back of Leg& Sole									
Number of competencies:(7)									
AN19.1	Describe and demonstrate the major muscles of back of leg with their attachment, nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN19.2	Describe and demonstrate the origin, course, relations, branches (or tributaries), termination of important nerves and vessels of back of leg	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN19.3	Explain the concept of “Peripheral heart”	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN19.4	Explain the anatomical basis of rupture of calcaneal tendon	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN19.5	Describe factors maintaining importance arches of the foot with its importance	K	KH	Y	Lecture	Written/ Viva voce			
AN19.6	Explain the anatomical basis of Flat foot & Club foot	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	
AN19.7	Explain the anatomical basis of Metatarsalgia & Plantar fasciitis	K	KH	N	Lecture	Written/ Viva voce		Orthopedics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: 20.General Features, Joints, radiographs & surface marking									
Number of competencies:(10)									
Number of procedures for certification:(NIL)									
AN20.1	Describe and demonstrate the type, articular surfaces, capsule, synovial membrane, ligaments, relations, movements and muscles involved, blood and nerve supply of tibiofibular and ankle joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN20.2	Describe the subtalar and transverse tarsal joints	K	KH	N	Lecture, DOAP session	Written/ Viva voce			
AN20.3	Describe and demonstrate Fascia lata, Venous drainage, Lymphatic drainage, Retinacula & Dermatomes of lower limb	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN20.4	Explain anatomical basis of enlarged inguinal lymph nodes	K	KH	N	Lecture	Written/ Viva voce		General Surgery	
AN20.5	Explain anatomical basis of varicose veins and deep vein thrombosis	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN20.6	Identify the bones and joints of lower limb seen in anteroposterior and lateral view radiographs of various regions of lower limb	K/S	SH	Y	Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		Radio diagnosis	
AN20.7	Identify & demonstrate important bony landmarks of lower limb: -Vertebral levels of highest point of iliac crest, posterior superior iliac spines, iliac tubercle, pubic tubercle, ischial tuberosity, adductor tubercle, -Tibial tuberosity, head of fibula, -Medial and lateral malleoli, Condyles of femur and tibia, sustentaculum tali, tuberosity of fifth metatarsal, tuberosity of the navicular	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN20.8	Identify & demonstrate palpation of femoral, popliteal, post tibial, anti tibial & dorsalis pedis blood vessels in a simulated environment	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		General Medicine	
AN20.9	Identify & demonstrate Palpation of vessels (femoral, popliteal, dorsalis pedis, post tibial), Mid inguinal point, Surface projection of: femoral nerve, Saphenous opening, Sciatic, tibial, common peroneal & deep peroneal nerve, Great and small saphenous veins	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		General Medicine, General Surgery	
AN20.10	Describe basic concept of development of lower limb	K	KH	N	Lecture	Viva voce			
Topic: 21. Thoraciccage									
Number of competencies:(11)									
AN21.1	Identify and describe the salient features of sternum, typical rib, 1 st rib and typical thoracic vertebra	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN21.2	Identify & describe the features of 2 nd , 11 th and 12 th ribs, 1 st , 11 th and 12 th thoracic vertebrae	K/S	SH	N	Lecture, DOAP session	Viva voce/ skill assessment			
AN21.3	Describe & demonstrate the boundaries of thoracic inlet, cavity and outlet	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN21.4	Describe & demonstrate extent, attachments, direction of fibres, nerve supply and actions of intercostal muscles	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN21.5	Describe & demonstrate origin, course, relations and branches of a typical intercostal nerve	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN21.6	Mention origin, course and branches/ tributaries of: 1) anterior & posterior intercostals vessels 2) internal thoracicvessels	K	KH	Y	session Practical, Lecture	Written/ Viva voce			
AN21.7	Mention the origin, course, relations and branches of 1) atypical intercostalnerve 2) superior intercostal artery, subcostalartery	K	KH	N	Lecture	Written			
AN21.8	Describe & demonstrate type, articular surfaces & movements of manubriosternal, costovertebral, costotransverse and xiphisternal joints	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN21.9	Describe & demonstrate mechanics and types of respiration	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN21.10	Describe costochondral and interchondral joints	K	KH	N	Lecture	Written			
AN21.11	Mention boundaries and contents of the superior, anterior, middle and posterior mediastinum	K	KH	Y	Practical, Lecture	Written/ Viva voce			
Topic: 22. Heart & Pericardium									
Number of competencies:(7)					Number of procedures for certification:(NIL)				
AN22.1	Describe & demonstrate subdivisions, sinuses in pericardium, blood supply and nerve supply of pericardium	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN22.2	Describe & demonstrate external and internal features of each chamber of heart	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN22.3	Describe & demonstrate origin, course and branches of coronary arteries	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN22.4	Describe anatomical basis of ischaemic heart disease	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN22.5	Describe & demonstrate the formation, course, tributaries and termination of coronary sinus	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN22.6	Describe the fibrous skeleton of heart	K	KH	Y	Lecture	Written			
AN22.7	Mention the parts, position and arterial supply of the conducting system of heart	K	KH	Y	Lecture	Written		General Medicine	Physiology
Topic: 23.Mediastinum									
Number of competencies:(7)									
AN23.1	Describe & demonstrate the external appearance, relations, blood supply, nerve supply,lymphatic drainage and applied anatomy of oesophagus	K/S	SH	Y	Practical, Lecture, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN23.2	Describe & demonstrate the extent, relations tributaries of thoracic duct and enumerate its applied anatomy	K/S	SH	Y	Practical, Lecture, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN23.3	Describe & demonstrate origin, course, relations, tributaries and termination of superior venacava, azygos, hemiazygos and accessory hemiazygos veins	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN23.4	Mention the extent, branches and relations of arch of aorta & descending thoracic aorta	K	KH	Y	Practical, Lecture	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN23.5	Identify & Mention the location and extent of thoracic sympathetic chain	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN23.6	Describe the splanchnic nerves	K	KH	N	Lecture	Written			
AN23.7	Mention the extent, relations and applied anatomy of lymphatic duct	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
Topic: 24.Lungs& Trachea									
Number of competencies:(6)					Number of procedures for certification:(NIL)				
AN24.1	Mention the blood supply, lymphatic drainage and nerve supply of pleura, extent of pleura and describe the pleural recesses and their applied anatomy	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Medicine	Physiology
AN24.2	Identify side, external features and relations of structures which form root of lung & bronchial tree and their clinical correlate	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology
AN24.3	Describe a bronchopulmonary segment	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN24.4	Identify phrenic nerve & describe its formation & distribution	K/S	SH	Y	Lecture, Practical	Written/ Viva voce			
AN24.5	Mention the blood supply, lymphatic drainage and nerve supply of lungs	K	KH	Y	Lecture	Written/ Viva voce			
AN24.6	Describe the extent, length, relations, blood supply, lymphatic drainage and nerve supply of trachea	K	KH	N	Lecture	Written			
Number of competencies:(9)					Number of procedures for certification:(01)				
Topic: 25.Thorax									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN25.1	Identify, draw and label a slide of trachea and lung	K/S	SH	Y	Lecture, Practical	Written/ skill assessment	1		
AN25.2	Describe development of pleura, lung & heart	K	KH	Y	Lecture	Written			
AN25.3	Describe fetal circulation and changes occurring at birth	K	KH	Y	Lecture	Written		General Medicine	Physiology
AN25.4	Describe embryological basis of: 1) atrial septal defect, 2) ventricular septal defect, 3) Fallot's tetralogy & 4) tracheo-oesophageal fistula	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology
AN25.5	Describe developmental basis of congenital anomalies, transposition of great vessels, dextrocardia, patent ductus arteriosus and coarctation of aorta	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology
AN25.6	Mention development of aortic arch arteries, SVC, IVC and coronary sinus	K	KH	N	Lecture	Written/ Viva voce			
AN25.7	Identify structures seen on a plain x-ray chest (PA view)	K/S	SH	Y	Practical, DOAP session	Written/ Viva voce		Radio diagnosis, General Medicine	
AN25.8	Identify and describe in brief a barium swallow	K/S	SH	N	Practical, DOAP session	Written/ Viva voce		Radio diagnosis, General Medicine	
AN25.9	Demonstrate surface marking of lines of pleural reflection, lung borders and fissures, trachea, heart borders, apex beat & surface projection of valves of heart	K/S	SH	Y	Practical	Viva voce/ skill assessment		General Medicine, Pediatrics	Physiology
Topic:26.Skullosteoology									
							Number of competencies:(7)		
							Number of procedures for certification:(NIL)		

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN26.1	Demonstrate anatomical position of skull, Identify and locate individual skull bones in skull	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.2	Describe the features of norma frontalis, verticalis, occipitalis, lateralis and basalis	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.3	Describe cranial cavity, its subdivisions, foramina and structures passing through them	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.4	Describe morphological features of mandible	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.5	Describe features of typical and atypical cervical vertebrae (atlas and axis)	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment			
AN26.6	Explain the concept of bones that ossify in membrane	K	KH	N	Lecture	Viva voce			
AN26.7	Describe the features of the 7 th cervical vertebra	K/S	SH	N	DOAP session	Viva voce			
Topic:27.Scalp									
Number of competencies:(2)									
AN27.1	Describe the layers of scalp, its blood supply, its nerve supply and surgical importance	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Surgery	
AN27.2	Describe emissary veins with its role in spread of infection from extracranial route to intracranial venous sinuses	K	KH	Y	Lecture	Written			
Topic: 28.Face &parotid region									
Number of competencies:(10)									
Number of procedures for certification:(NIL)									
AN28.1	Describe & demonstrate muscles of facial expression and their nerve supply	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN28.2	Describe sensory innervation of face	K	KH	Y	Practical, Lecture session	Written/ Viva voce			
AN28.3	Describe & demonstrate origin /formation, course, branches /tributaries of facial vessels	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN28.4	Describe & demonstrate branches of facial nerve with distribution	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN28.5	Describe cervical lymph nodes and lymphatic drainage of head, face and neck	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN28.6	Identify superficial muscles of face, their nerve supply and actions	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN28.7	Explain the anatomical basis of facial nerve palsy	K	KH	Y	Lecture	Written		General Medicine	
AN28.8	Explain surgical importance of deep facial vein	K	KH	Y	Lecture	Written		General Surgery	
AN28.9	Describe & demonstrate the parts, borders, surfaces, contents, relations and nerve supply of parotid gland with course of its duct and surgical importance	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN28.10	Explain the anatomical basis of Frey's syndrome	K	KH	N	Lecture	Written		General Surgery	
Topic: 29. Posterior triangle of neck							Number of procedures for certification:(NIL)		

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN29.1	Describe & demonstrate attachments, nerve supply, relations and actions of sternocleidomastoid	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN29.2	Explain anatomical basis of Erb's & Klumpke's palsy	K	KH	Y	Lecture	Written		General Surgery	
AN29.3	Explain anatomical basis of wry neck	K	KH	N	Lecture	Written		General Surgery	
AN29.4	Describe & demonstrate attachments of 1) inferior belly of omohyoid, 2) scalenus anterior, 3) scalenus medius & 4) levator scapulae	K/S	SH	N	Lecture, Practical	Written/ Viva voce			
Topic: 30. Cranial cavity									
Number of competencies:(5)					Number of procedures for certification:(NIL)				
AN30.1	Describe the cranial fossae & identify related structures	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN30.2	Describe & identify major foramina with structures passing through them	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN30.3	Describe & identify dural folds & dural venous sinuses	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN30.4	Describe clinical importance of dural venous sinuses	K	KH	Y	Lecture	Written			
AN30.5	Explain effect of pituitary tumours on visual pathway	K	KH	N	Lecture	Written		Ophthalmology	
Number of competencies:(5)					Number of procedures for certification:(NIL)				
Topic:31.Orbit									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN31.1	Describe & identify extra ocular muscles of eyeball	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN31.2	Describe & demonstrate nerves and vessels in the orbit	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN31.3	Describe anatomical basis of Horner's syndrome	K	KH	N	Lecture	Written		Ophthalmology	
AN31.4	Enumerate components of lacrimal apparatus	K	KH	Y	Lecture	Written			
AN31.5	Explain the anatomical basis of oculomotor, trochlear and abducent nerve palsies along with strabismus	K	KH	Y	Lecture	Written		Ophthalmology	
Topic: 32. Anterior Triangle									
Number of competencies:(2)									
AN32.1	Describe boundaries and subdivisions of anterior triangle	K	KH	Y	Practical, Lecture	Written/ Viva voce			
AN32.2	Describe & demonstrate boundaries and contents of muscular, carotid, digastric and submental triangles	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
Topic: 33. Temporal and Infratemporal regions									
Number of competencies:(5)									
AN33.1	Describe & demonstrate extent, boundaries and contents of temporal and infratemporal fossae	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN33.2	Describe & demonstrate attachments, direction of fibres, nerve supply and actions of muscles of mastication	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN33.3	Describe & demonstrate articulating surface, type & movements of temporomandibular joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN33.4	Explain the clinical significance of pterygoid venous plexus	K	KH	Y	Lecture	Written		General Surgery	
AN33.5	Describe the features of dislocation of temporomandibular joint	K	KH	N	Lecture	Written		General Surgery	
Topic:34.Submandibular region									
Number of competencies:(2)					Number of procedures for certification:(NIL)				
AN34.1	Describe & demonstrate the morphology, relations and nerve supply of submandibular salivary gland & submandibular ganglion	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN34.2	Describe the basis of formation of submandibular stones	K	KH	N	Lecture	Written		General Surgery	
Topic: 35.Deep structures in the neck					Number of procedures for certification:(NIL)				
Number of competencies:(10)									
AN35.1	Describe the parts, extent, attachments, modifications of deep cervical fascia	K	KH	Y	Lecture	Written			
AN35.2	Describe & demonstrate location, parts, borders, surfaces, relations & blood supply of thyroid gland	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN35.3	Demonstrate & describe the origin, parts, course & branches subclavian artery	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN35.4	Describe & demonstrate origin, course, relations, tributaries and termination of internal jugular & brachiocephalic veins	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN35.5	Describe and demonstrate extent, drainage & applied anatomy of cervical lymph nodes	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN35.6	Describe and demonstrate the extent, formation, relation & branches of cervical sympathetic chain	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN35.7	Describe the course and branches of IX, X, XI & XII nerve in the neck	K	KH	Y	Lecture	Written			
AN35.8	Describe the anatomically relevant clinical features of Thyroid swellings	K	KH	N	Lecture	Written		General Surgery	
AN35.9	Describe the clinical features of compression of subclavian artery and lower trunk of brachial plexus by cervical rib	K	KH	N	Lecture	Written		General Surgery	
AN35.10	Describe the fascial spaces of neck	K	KH	N	Lecture	Written			
Topic: 36.Mouth, Pharynx &Palate									
Number of competencies:(5)									
Number of procedures for certification:(NIL)									
AN36.1	Describe the 1) morphology, relations, blood supply and applied anatomy of palatine tonsil 2) composition of soft palate	K	KH	Y	Lecture	Written		ENT	
AN36.2	Describe the components and functions of Waldeyer's lymphatic ring	K	KH	Y	Lecture	Written		ENT	
AN36.3	Describe the boundaries and clinical significance of pyriform fossa	K	KH	N	Lecture	Written		ENT	
AN36.4	Describe the anatomical basis of tonsillitis, tonsillectomy, adenoids and peri- tonsillar	K	KH	N	Lecture	Written		ENT	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
	abscess								
AN36.5	Describe the clinical significance of Killian's dehiscence	K	KH	N	Lecture	Written		ENT	
Topic:37.CavityofNose									
Number of competencies:(3)									
AN37.1	Describe & demonstrate features of nasal septum, lateral wall of nose, their blood supply and nerve supply	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	
AN37.2	Describe location and functional anatomy of paranasal sinuses	K	KH	Y	Lecture	Written		ENT	
AN37.3	Describe anatomical basis of sinusitis & maxillary sinus tumours	K	KH	N	Lecture	Written		ENT	
Topic:38. Larynx									
Number of competencies:(3)									
AN38.1	Describe the morphology, identify structure of the wall, nerve supply, blood supply and actions of intrinsic and extrinsic muscles of the larynx	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	
AN38.2	Describe the anatomical aspects of laryngitis	K	KH	N	Lecture	Written		ENT	
AN38.3	Describe anatomical basis of recurrent laryngeal nerve injury	K	KH	N	Lecture	Written		ENT	
Topic:39.Tongue									
Number of competencies:(2)									
AN39.1	Describe & demonstrate the morphology, nerve supply, embryological basis of nerve supply, blood supply, lymphatic drainage and actions of extrinsic and intrinsic muscles of tongue	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN39.2	Explain the anatomical basis of hypoglossal nerve palsy	K	KH	N	Lecture	Written		ENT	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic:40. Organs of hearing and equilibrium									
Number of competencies:(5)									
AN40.1	Describe & identify the parts, blood supply and nerve supply of external ear	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	
AN40.2	Describe & demonstrate the boundaries, contents, relations and functional anatomy of middle ear and auditory tube	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		ENT	
AN40.3	Describe the features of internal ear	K	KH	N	Lecture	Written		ENT	
AN40.4	Explain anatomical basis of otitis externa and otitis media	K	KH	N	Lecture	Written		ENT	
AN40.5	Explain anatomical basis of myringotomy	K	KH	N	Lecture	Written		ENT	
Topic: 41.Eyeball									
Number of competencies:(3)									
AN41.1	Describe & demonstrate parts and layers of eyeball	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Ophthalmology	
AN41.2	Describe the anatomical aspects of cataract, glaucoma & central retinal artery occlusion	K	KH	N	Lecture	Written		Ophthalmology	
AN41.3	Describe the position, nerve supply and actions of intraocular muscles	K	KH	N	Lecture	Written		Ophthalmology	
Topic:42.BackRegion									
Number of competencies:(3)									
AN42.1	Describe the contents of the vertebral canal	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN42.2	Describe & demonstrate the boundaries and contents of Suboccipital triangle	K/S	SH	Y	Practical, Lecture, Small group	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN42.3	Describe the position, direction of fibres, relations, nerve supply, actions of semispinalis capitis and splenius capitis	K	KH	N	discussion, DOAP session Lecture	assessment Written			
Topic: 43.Head & neck Joints, Histology, Development, Radiography & Surface marking									
AN43.1	Describe & demonstrate the movements with muscles producing the movements of atlantooccipital joint & atlantoaxial joint	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN43.2	Identify, describe and draw the microanatomy of pituitary gland, thyroid, parathyroid gland, tongue, salivary glands, tonsil, epiglottis, cornea, retina	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
AN43.3	Identify, describe and draw microanatomy of olfactory epithelium, eyelid, lip, sclero-corneal junction, optic nerve, cochlea- organ of corti, pineal gland	K/S	SH	N	Lecture, Practical	Written/ skill assessment			
AN43.4	Describe the development and developmental basis of congenital anomalies of face, palate, tongue, branchial apparatus, pituitary gland, thyroid gland & eye	K	KH	Y	Lecture	Written/ Viva voce			
AN43.5	Demonstrate- 1) Testing of muscles of facial expression, extraocular muscles, muscles of mastication, 2) Palpation of carotid arteries, facial artery, superficial temporal artery, 3) Location of internal and external jugular veins, 4) Location of hyoid bone, thyroid cartilage and cricoid cartilage with their vertebral levels	K/S	SH	Y	Practical	Viva voce/ skill assessment		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN43.6	Demonstrate surface projection of- Thyroid gland, Parotid gland and duct, Pterion, Common carotid artery, Internal jugular vein, Subclavian vein, External jugular vein, Facial artery in the face & accessory nerve	K/S	SH	N	Practical	Viva voce/ skill assessment		General Surgery	
AN43.7	Identify the anatomical structures in 1) Plain x-ray skull, 2) AP view and lateral view 3) Plain x-ray cervical spine-AP and lateral view 4) Plain x-ray of paranasal sinuses	K/S	SH	Y	Practical	Viva voce/ skill assessment		Radiodiagnosis	
AN43.8	Describe the anatomical route used for carotid angiogram and vertebral angiogram	K/S	SH	N	Practical	Viva voce/ skill assessment		Radio diagnosis	
AN43.9	Identify anatomical structures in carotid angiogram and vertebral angiogram	K/S	SH	N	Practical	Viva voce/ skill assessment		Radio diagnosis	
Topic: 44.Anteriorabdominalwall									
Number of competencies:(7)									
Number of procedures for certification:(NIL)									
AN44.1	Describe & demonstrate the Planes (transpyloric, transtubercular, subcostal, lateral vertical, linea alba, linea semilunaris), regions & Quadrants of abdomen	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN44.2	Describe & identify the Fascia, nerves & blood vessels of anterior abdominal wall	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN44.3	Describe the formation of rectus sheath and its contents	K	KH	Y	Lecture	Written/ Viva voce			
AN44.4	Describe & demonstrate extent, boundaries, contents of Inguinal canal including Hesselbach's triangle.	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN44.5	Explain the anatomical basis of inguinal hernia.	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN44.6	Describe & demonstrate attachments of muscles of anterior abdominal wall	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN44.7	Enumerate common Abdominal incisions	K	KH	N	Lecture	Written		General Surgery	
Topic: 45. Posterior abdominal wall									
Number of competencies:(3)									
certification:(NIL)									
AN45.1	Describe Thoracolumbar fascia	K	KH	Y	Lecture	Written			
AN45.2	Describe & demonstrate Lumbar plexus for its root value, formation & branches	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN45.3	Mention the major subgroups of back muscles, nerve supply and action	K	KH	N	Lecture	Written			
Topic: 46. Male external genitalia									
Number of competencies:(5)									
certification:(NIL)									
AN46.1	Describe & demonstrate coverings, internal structure, side determination, blood supply, nerve supply, lymphatic drainage & descent of testis with its applied anatomy	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN46.2	Describe parts of Epididymis	K	KH	Y	Lecture, Practical	Written/ Viva voce			
AN46.3	Describe Penis under following headings: (parts, components, blood supply and lymphatic drainage)	K	KH	Y	Lecture, Practical	Written/ Viva voce			
AN46.4	Explain the anatomical basis of Varicocele	K	KH	N	Lecture	Written		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN46.5	Explain the anatomical basis of Phimosis & Circumcision	K	KH	N	Lecture	Written		General Surgery	
Topic: 47. Abdominal cavity									
Number of competencies:(14)									
Number of procedures for certification:(NIL)									
AN47.1	Describe & identify boundaries and recesses of Lesser & Greater sac	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN47.2	Name & identify various peritoneal folds & pouches with its explanation.	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN47.3	Explain anatomical basis of Ascites & Peritonitis	K	KH	N	Lecture	Written		General Surgery	
AN47.4	Explain anatomical basis of Subphrenic abscess	K	KH	N	Lecture	Written		General Surgery	
AN47.5	Describe & demonstrate major viscera of abdomen under following headings (anatomical position, external and internal features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and applied aspects)	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN47.6	Explain the anatomical basis of Splenic notch, Accessory spleens, Kehr's sign, Different types of vagotomy, Liver biopsy (site of needle puncture), Referred pain in cholecystitis, Obstructive jaundice, Referred pain around umbilicus, Radiating pain of kidney to groin & Lymphatic spread in carcinoma stomach	K	KH	N	Lecture	Written		General Surgery	
AN47.7	Mention the clinical importance of Calot's triangle	K	KH	N	Lecture	Written		General Surgery	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN47.8	Describe & identify the formation, course relations and tributaries of Portal vein, Inferior vena cava & Renal vein	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN47.9	Describe & identify the origin, course, important relations and branches of Abdominal aorta, Coeliac trunk, Superior mesenteric, Inferior mesenteric & Common iliac artery	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN47.10	Enumerate the sites of portosystemic anastomosis	K	KH	Y	Lecture	Written		General Surgery	
AN47.11	Explain the anatomic basis of hematemesis & caput medusae in portal hypertension	K	KH	Y	Lecture,	Written/ Viva voce		General Surgery	
AN47.12	Describe important nerve plexuses of posterior abdominal wall	K	KH	N	Lecture	Written			
AN47.13	Describe & demonstrate the attachments, openings, nerve supply & action of the thoracoabdominal diaphragm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN47.14	Describe the abnormal openings of thoracoabdominal diaphragm and diaphragmatic hernia	K	KH	N	Lecture	Written		General Surgery	
Topic: 48. Pelvic wall and viscera									
Number of competencies: (8)					Number of procedures for certification: (NIL)				
AN48.1	Describe & identify the muscles of Pelvic diaphragm	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN48.2	Describe & demonstrate the (position, features, important peritoneal and other relations, blood supply, nerve supply, lymphatic drainage and clinical aspects of) important male & female	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
	pelvic viscera								
AN48.3	Describe & demonstrate the origin, course, important relations and branches of internal iliac artery	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN48.4	Describe the branches of sacral plexus	K	KH	Y	Lecture	Written			
AN48.5	Explain the anatomical basis of suprapubic cystostomy, Urinary obstruction in benign prostatic hypertrophy, Retroverted uterus, Prolapse uterus, Internal and external haemorrhoids, Anal fistula, Vasectomy, Tubal pregnancy & Tubal ligation	K	KH	N	Lecture	Written		General Surgery	
AN48.6	Describe the neurological basis of Automatic bladder	K	KH	N	Lecture	Written		General Surgery	
AN48.7	Mention the lobes involved in benign prostatic hypertrophy & prostatic cancer	K	KH	N	Lecture	Written		General Surgery	
AN48.8	Mention the structures palpable during vaginal & rectal examination	K	KH	N	Lecture	Written		Obstetrics & Gynaecology General Surgery	
Topic:49.Perineum									
Number of competencies:(5)									
Number of procedures for certification:(NIL)									
AN49.1	Describe & demonstrate the superficial & deep perineal pouch (boundaries and contents)	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN49.2	Describe & identify Perineal body	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN49.3	Describe & demonstrate Perineal membrane in male & female	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN49.4	Describe & demonstrate boundaries, content & applied anatomy of Ischiorectal fossa	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Surgery	
AN49.5	Explain the anatomical basis of Perineal tear, Episiotomy, Perianal abscess and Anal fissure	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
Topic:50.Vertebraecolumn									
Number of competencies:(4)									
AN50.1	Describe the curvatures of the vertebral column	K	KH	Y	Lecture	Written/ Viva voce			
AN50.2	Describe & demonstrate the type, articular ends, ligaments and movements of Intervertebral joints, Sacroiliac joints & Pubic symphysis	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN50.3	Describe lumbar puncture (site, direction of the needle, structures pierced during the lumbar puncture)	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	
AN50.4	Explain the anatomical basis of Scoliosis, Lordosis, Prolapsed disc, Spondylolisthesis & Spina bifida	K	KH	N	Lecture	Written		Orthopedics	
Topic: 51.Sectional Anatomy									
Number of competencies:(2)									
AN51.1	Describe & identify the cross-section at the level of T8, T10 and L1 (transpyloric plane)	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Radio diagnosis	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN51.2	Describe & identify the midsagittal section of male and female pelvis	K	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		Radio diagnosis	
Topic: 52.Histology&Embryology									
Number of competencies:(8)									
AN52.1	Describe & identify the microanatomical features of Gastro-intestinal system: Oesophagus, Fundus of stomach, Pylorus of stomach, Duodenum, Jejunum, Ileum, Large intestine, Appendix, Liver, Gall bladder, Pancreas & Suprarenal gland	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
AN52.2	Describe & identify the microanatomical features of: Urinary system: Kidney, Ureter & Urinary bladder Male Reproductive System: Testis, Epididymis, Vas deferens, Prostate & penis Female reproductive system: Ovary, Uterus, Uterine tube, Cervix, Placenta & Umbilical cord	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
AN52.3	Describe & identify the microanatomical features of Cardiooesophageal junction, Corpus luteum	K/S	SH	N	Lecture, Practical	Written/ skill assessment			
AN52.4	Describe the development of anterior abdominal wall	K	KH	N	Lecture	Written/ Viva voce			
AN52.5	Describe the development and congenital anomalies of Diaphragm	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN52.6	Describe the development and congenital anomalies of: Foregut, Midgut & Hindgut	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN52.7	Describe the development of Urinary system	K	KH	Y	Lecture	Written/ Viva voce		General Surgery	
AN52.8	Describe the development of male & female reproductive system	K	KH	Y	Lecture	Written/ Viva voce		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic:53.Osteology									
Number of competencies:(4)									
AN53.1	Identify & hold the bone in the anatomical position, Describe the salient features, articulations & demonstrate the attachments of muscle groups	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		General Surgery, Obstetrics & Gynaecology	
AN53.2	Demonstrate the anatomical position of bony pelvis & show boundaries of pelvic inlet, pelvic cavity, pelvic outlet	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN53.3	Define true pelvis and false pelvis and demonstrate sex determination in male & female bony pelvis	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		Obstetrics & Gynaecology	
AN53.4	Explain and demonstrate clinical importance of bones of abdominopelvic region (sacralization of lumbar vertebra, Lumbarization of 1st sacral vertebra, types of bony pelvis & Coccyx)	K/S	SH	N	Lecture, DOAP session	Viva voce/ skill assessment			
Topic:54.Radiodiagnosis									
Number of competencies:(3)									
AN54.1	Describe & identify features of plain X ray abdomen	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		Radio diagnosis	
AN54.2	Describe & identify the special radiographs of abdominopelvic region (contrast X ray Barium swallow, Barium meal, Barium enema, Cholecystography, Intravenous pyelography & Hysterosalpingography)	K/S	SH	Y	Lecture, DOAP session	Viva voce/ skill assessment		Radio diagnosis	
AN54.3	Describe role of ERCP, CT abdomen, MRI, Arteriography in radiodiagnosis of abdomen	K	KH	N	Lecture	Viva voce		Radio diagnosis	
Topic:55.Surface marking									
Number of competencies:(2)									
Number of procedures for certification:(NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN55.1	Demonstrate the surface marking of; Regions and planes of abdomen, Superficial inguinal ring, Deep inguinal ring , McBurney's point, Renal Angle & Murphy's point	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		General Surgery	
AN55.2	Demonstrate the surface projections of: Stomach, Liver, Fundus of gall bladder, Spleen, Duodenum, Pancreas, Ileocaecal junction, Kidneys & Root of mesentery	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Viva voce/ skill assessment		General Surgery	
Topic: 56. Meninges & CSF									
Number of competencies:(2)									
AN56.1	Describe & identify various layers of meninges with its extent & modifications	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	
AN56.2	Describe circulation of CSF with its applied anatomy	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
Topic:57.SpinalCord									
Number of competencies:(5)									
AN57.1	Identify external features of spinal cord	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN57.2	Describe extent of spinal cord in child & adult with its clinical implication	K	KH	Y	Lecture	Written/ Viva voce			
AN57.3	Draw & label transverse section of spinal cord at mid-cervical & mid- thoracic level	K	KH	Y	Lecture	Written/ Viva voce			
AN57.4	Enumerate ascending & descending tracts at mid thoracic level of spinal cord	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN57.5	Describe anatomical basis of syringomyelia	K	KH	N	Lecture	Written		General Medicine	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic:58.MedullaOblongata									
Number of competencies:(4)									
AN58.1	Identify external features of medulla oblongata	K/S	SH	Y	Lecture, DOAP session	Written/ Viva voce/ skill assessment			
AN58.2	Describe transverse section of medulla oblongata at the level of 1) pyramidal decussation, 2) sensory decussation 3) ION	K	KH	Y	Lecture	Written/ Viva voce			
AN58.3	Enumerate cranial nerve nuclei in medulla oblongata with their functional group	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN58.4	Describe anatomical basis & effects of medial & lateral medullary syndrome	K	KH	N	Lecture	Written		General Medicine	Physiology
Topic:59.Pons									
Number of competencies:(3)									
AN59.1	Identify external features of pons	K/S	SH	Y	Lecture, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN59.2	Draw & label transverse section of pons at the upper and lower level	K	KH	Y	Lecture	Written/ Viva voce			
AN59.3	Enumerate cranial nerve nuclei in pons with their functional group	K	KH	Y	Lecture	Written/ Viva voce			
Topic:60.Cerebellum									
Number of competencies:(3)									
AN60.1	Describe & demonstrate external & internal features of cerebellum	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN60.2	Describe connections of cerebellar cortex and intracerebellar nuclei	K	KH	Y	Lecture	Written/ Viva voce			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN60.3	Describe anatomical basis of cerebellar dysfunction	K	KH	N	Lecture	Written		General Medicine	Physiology
Topic:61.Midbrain									
Number of competencies:(3)									
AN61.1	Identify external & internal features of midbrain	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			
AN61.2	Describe internal features of midbrain at the level of superior & inferior colliculus	K	KH	Y	Lecture	Written/ Viva voce			
AN61.3	Describe anatomical basis & effects of Benedikt's and Weber's syndrome	K	KH	N	Lecture	Written		General Medicine	Physiology
Topic: 62.Cranial nerve nuclei &Cerebralhemispheres									
Number of competencies:(6)									
AN62.1	Enumerate cranial nerve nuclei with its functional component	K	KH	Y	Lecture	Written/ Viva voce			
AN62.2	Describe & demonstrate surfaces, sulci, gyri, poles, & functional areas of cerebral hemisphere	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology
AN62.3	Describe the white matter of cerebrum	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.4	Enumerate parts & major connections of basal ganglia & limbic lobe	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN62.5	Describe boundaries, parts, gross relations, major nuclei and connections of dorsal thalamus, hypothalamus, epithalamus, metathalamus and subthalamus	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN62.6	Describe & identify formation, branches & major areas of distribution of circle of Willis	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology
Topic: 63. Ventricular System									
Number of competencies:(2)									
AN63.1	Describe & demonstrate parts, boundaries & features of IIIrd, IVth & lateral ventricle	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN63.2	Describe anatomical basis of congenital hydrocephalus	K	KH	N	Lecture	Written		Pediatrics	Physiology
Topic: 64. Histology & Embryology									
Number of competencies:(3)									
AN64.1	Describe & identify the microanatomical features of Spinal cord, Cerebellum & Cerebrum	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
AN64.2	Describe the development of neural tube, spinal cord, medulla oblongata, pons, midbrain, cerebral hemisphere & cerebellum	K	KH	Y	Lecture	Written/ Viva voce			
AN64.3	Describe various types of open neural tube defects with its embryological basis	K	KH	N	Lecture	Written/ Viva voce		Obstetrics & Gynaecology, Pediatrics	
Topic: 65. Epithelium histology									
Number of competencies:(2)									
AN65.1	Identify epithelium under the microscope & describe the various types that correlate to its function	K/S	P	Y	Lecture, Practical	Written/ skill assessment	1		
AN65.2	Describe the ultrastructure of epithelium	K	KH	N	Lecture, Practical	Written			
Topic: 66. Connective tissue histology									
Number of competencies:(2)									
Number of procedures for certification:(NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN66.1	Describe & identify various types of connective tissue with functional correlation	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			Physiology
AN66.2	Describe the ultrastructure of connective tissue	K	KH	N	Lecture, Practical	Written		Pathology	
Topic: 67.Musclehistology Number of competencies:(3) Number of procedures for certification:(NIL)									
AN67.1	Describe & identify various types of muscle under the microscope	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
AN67.2	Classify muscle and describe the structure-function correlation of the same	K	KH	Y	Lecture, Practical	Written			Physiology
AN67.3	Describe the ultrastructure of muscular tissue	K	KH	N	Lecture, Practical	Written			
Topic:68.Nervous tissue histology Number of competencies:(3) Number of procedures for certification:(NIL)									
AN68.1	Describe & Identify multipolar & unipolar neuron, ganglia, peripheral nerve	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
AN68.2	Describe the structure-function correlation of neuron	K	KH	Y	Lecture, Practical	Written			Physiology
AN68.3	Describe the ultrastructure of nervous tissue	K	KH	N	Lecture, Practical	Written			
Topic:69.Blood Vessels Number of competencies:(3) Number of procedures for certification:(NIL)									
AN69.1	Identify elastic & muscular blood vessels, capillaries under the microscope	K/S	SH	Y	Lecture, Practical	Skill assessment			
AN69.2	Describe the various types and structure-function correlation of blood vessel	K	KH	Y	Lecture, Practical	Written			Physiology
AN69.3	Describe the ultrastructure of blood vessels	K	KH	Y	Lecture, Practical	Written			
Topic: 70.Glands & Lymphoid tissue Number of competencies:(2) Number of procedures for certification:(NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN70.1	Identify exocrine gland under the microscope & distinguish between serous, mucous and mixed acini	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
AN70.2	Identify the lymphoid tissue under the microscope & describe microanatomy of lymph node, spleen, thymus, tonsil and correlate the structure with function	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
Topic: 71.Bone & Cartilage									
Number of competencies:(2)									
Number of procedures for certification:(NIL)									
AN71.1	Identify bone under the microscope; classify various types and describe the structure-function correlation of the same	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
AN71.2	Identify cartilage under the microscope & describe various types and structure- function correlation of the same	K/S	SH	Y	Lecture, Practical	Written/ skill assessment		Pathology	
Topic:72.IntegumentarySystem									
Number of competencies:(1)									
Number of procedures for certification:(NIL)									
AN72.1	Identify the skin and its appendages under the microscope and correlate the structure with function	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			
Topic:73.Chromosomes									
Number of competencies:(3)									
Number of procedures for certification:(NIL)									
AN73.1	Describe the structure of chromosomes with classification	K	KH	Y	Lecture	Written			
AN73.2	Describe technique of karyotyping with its applications	K	KH	Y	Lecture	Written			
AN73.3	Describe the Lyon's hypothesis	K	KH	Y	Lecture	Written			
Topic: 74.PatternsofInheritance									
Number of competencies:(4)									
Number of procedures for certification:(NIL)									
AN74.1	Describe the various modes of inheritance with examples	K	KH	Y	Lecture	Written		General Medicine,	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN74.2	Draw pedigree charts for the various types of inheritance & give examples of diseases of each mode of inheritance	K	KH	Y	Lecture	Written		Pediatrics General Medicine, Pediatrics	
AN74.3	Describe multifactorial inheritance with examples	K	KH	Y	Lecture	Written		General Medicine	
AN74.4	Describe the genetic basis & clinical features of Achondroplasia, Cystic Fibrosis, Vitamin D resistant rickets, Haemophilia, Duchene's muscular dystrophy & Sickle cell anaemia	K	KH	N	Lecture	Written		General Medicine, Pediatrics	
Topic: 75.Principle of Genetics, Chromosomal Aberrations Number of competencies:(5) &Clinical Genetics									
AN75.1	Describe the structural and numerical chromosomal aberrations	K	KH	Y	Lecture	Written		Pediatrics	
AN75.2	Explain the terms mosaics and chimeras with example	K	KH	N	Lecture	Written		Pediatrics	
AN75.3	Describe the genetic basis & clinical features of Prader Willi syndrome, Edward syndrome & Patau syndrome	K	KH	N	Lecture	Written		Pediatrics	
AN75.4	Describe genetic basis of variation: polymorphism and mutation	K	KH	Y	Lecture	Written		Pediatrics	
AN75.5	Describe the principles of genetic counselling	K	KH	Y	Lecture	Written		Pediatrics, Obstetrics & Gynaecology	
Topic: 76.Introductiontoembryology									
AN76.1	Describe the stages of human life	K	KH	Y	Lecture	Written			
AN76.2	Explain the terms- phylogeny, ontogeny, trimester, viability	K	KH	Y	Lecture	written			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: 77. Gametogenesis and fertilization									
Number of competencies: (6) Number of procedures for certification: (NIL)									
AN77.1	Describe the uterine changes occurring during the menstrual cycle	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.2	Describe the synchrony between the ovarian and menstrual cycles	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.3	Describe spermatogenesis and oogenesis along with diagrams	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.4	Describe the stages and consequences of fertilisation	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.5	Enumerate and describe the anatomical principles underlying contraception	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN77.6	Describe teratogenic influences; fertility and sterility, surrogate motherhood, social significance of "sex-ratio".	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
Topic: 78. Second week of development									
Number of competencies: (5) Number of procedures for certification: (NIL)									
AN78.1	Describe cleavage and formation of blastocyst	K	KH	Y	Lecture	Written			
AN78.2	Describe the development of trophoblast	K	KH	Y	Lecture	Written			
AN78.3	Describe the process of implantation & common abnormal sites of implantation	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN78.4	Describe the formation of extra-embryonic mesoderm and coelom, bilaminar disc and prochordal plate	K	KH	Y	Lecture	Written			
AN78.5	Describe in brief abortion; decidual reaction, pregnancy test	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
Topic: 79. 3rd to 8th week of development									
Number of competencies: (6) Number of procedures for certification: (NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
AN79.1	Describe the formation & fate of the primitive streak	K	KH	Y	Lecture	Written			
AN79.2	Describe formation & fate of notochord	K	KH	Y	Lecture	Written			
AN79.3	Describe the process of neurulation	K	KH	Y	Lecture	Written			
AN79.4	Describe the development of somites and intra-embryonic coelom	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN79.5	Explain embryological basis of congenital malformations, nucleus pulposus, sacrococcygeal teratomas, neural tube defects	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
AN79.6	Describe the diagnosis of pregnancy in first trimester and role of teratogens, alpha-fetoprotein	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
Topic:80.Fetalmembranes									
Number of competencies:(7)									
certification:(NIL)									
AN80.1	Describe formation, functions & fate of-chorion: amnion; yolk sac; allantois & decidua	K	KH	Y	Lecture	Written			
AN80.2	Describe formation & structure of umbilical cord	K	KH	Y	Lecture	Written			
AN80.3	Describe formation of placenta, its physiological functions, foetomaternal circulation & placental barrier	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN80.4	Describe embryological basis of twinning in monozygotic & dizygotic twins	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN80.5	Describe role of placental hormones in uterine growth & parturition	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN80.6	Explain embryological basis of estimation of fetal age.	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	
AN80.7	Describe various types of umbilical cord attachments	K	KH	N	Lecture	Written		Obstetrics & Gynaecology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Topic: 81. Prenatal Diagnosis									
Number of competencies: (3)									
AN81.1	Describe various methods of prenatal diagnosis	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN81.2	Describe indications, process and disadvantages of amniocentesis	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
AN81.3	Describe indications, process and disadvantages of chorion villus biopsy	K	KH	Y	Lecture	Written		Obstetrics & Gynaecology	
Topic: 82. Ethics in Anatomy									
Number of competencies: (1)									
AN 82.1	Demonstrate respect and follow the correct procedure when handling cadavers and other biologic tissue	S	SH	Y	Group Activity	NIL		AETCOM	
Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently, Column F: DOAP session – Demonstrate, Observe, Assess, Perform. Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation									
PY3.1	Describe the structure and functions of a neuron and neuroglia; Discuss Nerve Growth Factor & other growth factors/cytokines	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY3.7	Describe the different types of muscle fibres and their structure	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY3.13	Describe muscular dystrophy: myopathies	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Human Anatomy
PY4.1	Describe the structure and functions of digestive system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY5.1	Describe the functional Anatomy of heart including chambers, sounds; and Pacemaker tissue and conducting system.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/SH/P	Core (Y/N)	Teaching-Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
PY5.6	Describe abnormal ECG, arrhythmias, heart block and myocardial Infarction	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Human Anatomy
PY9.1	Describe and discuss sex determination; sex differentiation and their abnormalities and outline psychiatry and practical implication of sex determination.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.1	Describe and discuss the organization of nervous system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.2	Describe and discuss the functions and properties of synapse, reflex, receptors	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.3	Describe and discuss somatic sensations & sensory tracts	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.4	Describe and discuss motor tracts, mechanism of maintenance of tone, control of body movements, posture and equilibrium & vestibular apparatus	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.5	Describe and discuss structure and functions of reticular activating system, autonomic nervous system (ANS)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.6	Describe and discuss Spinal cord, its functions, lesion & sensory disturbances	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.7	Describe and discuss functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system and their abnormalities	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	Human Anatomy
PY10.11	Demonstrate the correct clinical examination of the nervous system: Higher functions, Sensory system, motor system, reflexes, Cranial Nerves in a normal volunteer or simulated environment	S	P	Y	DOAP sessions	Skill assessment / Viva voce / OSCE	1 each (total 5)		Human Anatomy

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Biochemistry									
BI6.13	Describe the functions of the kidney, liver, thyroid and adrenal glands	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.14	Describe the tests that are commonly done in clinical practice to assess the functions of these organs (kidney, liver, thyroid and adrenal glands).	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.15	Describe the abnormalities of kidney, liver, thyroid and adrenal glands	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
Pathology									
PA28.10	Describe the etiology, pathogenesis, pathology, laboratory findings, distinguishing features progression and complications of acute and chronic pyelonephritis and reflux nephropathy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, General Surgery	
PA31.1	Classify and describe the types, etiology, pathogenesis, pathology and hormonal dependency of benign breast disease	K	KH	Y	Lecture, Small group	Written/ Viva voce		Human Anatomy, General Surgery	
PA32.1	Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
PA32.9	Describe the etiology, pathogenesis, manifestations, laboratory and morphologic features of adrenal neoplasms	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine,	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
PA33.1	Classify and describe the etiology, pathogenesis, manifestations, radiologic and morphologic features and complications of osteomyelitis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Surgery Human Anatomy, Orthopedics	Microbiology
Forensic Medicine									
FM2.28	Describe and discuss signs of intrauterine death, signs of live birth, viability of foetus, age determination of foetus, DOAP session of ossification centres, Hydrostatic test, Sudden infants death syndrome and Munchausen's syndrome by proxy.	K	KH	Y	Lectures, Small group discussion, Autopsy, DOAP session	Written/Viva voce/ OSCE		Pediatrics, Human Anatomy	
FM3.1	Identification Define and describe Corpus Delicti, establishment of identity of living persons including race, Sex, religion, complexion, stature, age determination using morphology, teeth-eruption, decay, bite marks, bones ossification centres, medico-legal aspects of age.	K	KH	Y	Lectures, Small group discussion, Bedside clinic, DOAP session	Written/ Viva voce/skill assessment		Human Anatomy	
Anesthesiology									
AS4.2	Describe the Anatomy of the airway and its implications for general anaesthesia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
AS5.2	Describe the correlative Anatomy of the brachial plexus, subarachnoid and epidural spaces	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
AS5.3	Observe and describe the principles and steps/ techniques involved in peripheral nerve blocks	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Human Anatomy	
AS8.1	Describe the anatomical correlates and physiologic principles of pain	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Human Anatomy Physiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
ENT									
EN1.1	Describe the Human Anatomy & physiology of ear, nose, throat, head & neck.	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce/Skill assessment		Human Anatomy	
Ophthalmology									
OP2.1	Enumerate the causes, describe and discuss the aetiology, clinical presentations and diagnostic features of common conditions of the lid and adnexa including Hordeolum externum/ internum, blepharitis, preseptal cellulitis, dacryocystitis, hemangioma, dermoid, ptosis, entropion, lid lag, lagophthalmos	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
OP4.1	Enumerate describe and discuss the types and causes of corneal ulceration	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
OP6.7	Enumerate and discuss the aetiology, the clinical distinguishing features of various glaucomas associated with shallow and deep anterior chamber. Choose appropriate investigations and treatment for patients with above conditions.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	
OP7.1	Describe the surgical anatomy and the metabolism of the lens	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Human Anatomy	
OP8.1	Discuss the aetiology, pathology, clinical features and management of vascular occlusions of the retina	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Pathology	
Dentistry									
DE1.1	Enumerate the parts of the tooth	K	K	N	Lecture, Small group discussion	Viva voce		Human Anatomy	
DE5.1	Enumerate the parts of the tooth and supporting structures	K	K	N	Lecture, Small group discussion	Viva voce		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
General Medicine									
IM3.1	Define discuss describe and distinguish community acquired pneumonia, nosocomial pneumonia and aspiration pneumonia	K	K	Y	Lecture, Small Group discussion	short note/ Viva voce		Human Anatomy, Pathology, Microbiology	
IM13.9	Demonstrate in a mannequin the correct technique for performing breast exam, rectal examination and cervical examination and pap smear	S	K	Y	Bedside clinic	Skill assessment/ short case		Human Anatomy	General Surgery
IM17.1	Define and classify headache and describe the presenting features, precipitating factors, aggravating and relieving factors of various kinds of headache	K	KH	Y	Lecture, Small group discussion	short note/ Viva voce		Human Anatomy	
IM18.1	Describe the functional and the vascular anatomy of the brain	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Human Anatomy	
IM19.1	Describe the functional anatomy of the locomotor system of the brain	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Human Anatomy, Physiology	
Obstetrics & Gynaecology									
OG2.1	Describe and discuss the development and anatomy of the female reproductive tract, relationship to other pelvic organs, applied anatomy as related to Obstetrics and Gynaecology.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ Skill assessment		Human Anatomy	
OG4.1	Describe and discuss the basic embryology of fetus , factors influencing fetal growth and development, anatomy and physiology of placenta, and teratogenesis	K	K	Y	Lecture, Small group discussion	Theory		Human Anatomy	
OG14.1	Enumerate and discuss the diameters of maternal pelvis and types	K	KH	Y	Lecture, Small group discussion, Bedside clinic,	Written/ Viva voce/ skill assessment		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
General Surgery									
SU19.1	Describe the etiology and classification of cleft lip and palate	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU19.2	Describe the Principles of reconstruction of cleft lip and palate	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU22.1	Describe the Applied anatomy, and physiology of thyroid	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU22.5	Describe the applied anatomy of parathyroid.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU23.1	Describe the applied anatomy of adrenal glands	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU24.1	Describe the clinical features, principles of investigation, prognosis and management of pancreatitis.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU25.1	Describe applied anatomy appropriate investigations for breast disease	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.2	Describe the clinical features, investigations and principles of management of congenital anomalies of Genitourinary system.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.5	Describe the applied anatomy and physiology of esophagus	K	K	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce		Human Anatomy, Physiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
SU28.7	Describe the applied anatomy and physiology of stomach.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.10	Describe the applied anatomy of liver. Describe the Clinical features, Investigations and principles of management of Liver abscess, hydatid disease, Injuries and Tumors of the liver.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.11	Describe the applied anatomy of Spleen. Describe the clinical features, Investigations and principles of management of splenic injuries. Describe the Post-splenectomy sepsis-prophylaxis.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.12	Describe the applied anatomy of biliary system. Describe the clinical features, investigations and principles of management of diseases of biliary system.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.13	Describe the applied anatomy of small and large intestines	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU28.16	Describe applied anatomy including congenital anomalies of the rectum and anal canal	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU30.2	Describe the applied anatomy, clinical features, investigations and principles of management of Undescended testis.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU30.3	Describe the applied anatomy, clinical features, investigations and principles of management of Epididymo-orchitis	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
SU30.4	Describe the applied anatomy, clinical features, investigations and principles of management of Varicocele	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
SU30.5	Describe the applied anatomy, clinical features, investigations and principles of management of Hydrocele	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
Orthopaedics									
OR2.1	Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of fracture of clavicle	K/S	KH/SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE	1	Human Anatomy	
OR2.2	Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of fractures of proximal humerus	K	K/KH/SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.3	Describe and discuss the mechanism of Injury, clinical features, investigations and plan management of supra condylar fracture of humerus	K	KH/SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.4	Describe and discuss the mechanism of injury, clinical features, investigations and principles of management of fracture of shaft of humerus and intercondylar fracture humerus with emphasis on neurovascular deficit	K/S	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.5	Describe and discuss the aetiopathogenesis, clinical features, mechanism of injury, investigation & principles of management of fractures of both bones forearm and Galeazzi and Monteggia injury	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.6	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of fractures of distal radius	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.7	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of	K	K/KH/SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
	pelvic injuries with emphasis on hemodynamic instability								
OR2.8	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of spine injuries with emphasis on mobilisation of the patient	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.9	Describe and discuss the mechanism of injury, Clinical features, investigations and principle of management of acetabular fracture	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.10	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of fractures of proximal femur	K/S/A/C	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.11	Describe and discuss the aetiopathogenesis, mechanism of injury, clinical features, investigations and principles of management of (a) Fracture patella (b) Fracture distal femur © Fracture proximal tibia with special focus on neurovascular injury and compartment syndrome	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.12	Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of Fracture shaft of femur in all age groups and the recognition and management of fat embolism as a complication	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.13	Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of: (a) Fracture both bones leg (b) Calcaneus (c) Small bones of foot	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
OR2.14	Describe and discuss the aetiopathogenesis, clinical features, Investigation and principles of management of ankle fractures	K/S/C	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR2.15	Plan and interpret the investigations to diagnose complications of fractures like malunion, non-union, infection, compartmental syndrome	K/S	SH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE	2	Human Anatomy	
OR2.16	Describe and discuss the mechanism of injury, clinical features, investigations and principles of management of open fractures with focus on secondary infection, prevention and management	K	K/KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce/ OSCE		Human Anatomy	
OR11.1	Describe and discuss the aetiopathogenesis, Clinical features, Investigations and principles of management of peripheral nerve injuries in diseases like foot drop, wrist drop, claw hand, palsies of Radial, Ulnar, Median, Lateral Popliteal and Sciatic Nerves	K	K/H	Y	Lecture, Small Group discussion, case discussion	Written/ Viva voce/ OSCE		Human Anatomy	General Medicine, General surgery
OR12.1	Describe and discuss the Clinical features, Investigations and principles of management of Congenital and acquired malformations and deformities of: a. limbs and spine - Scoliosis and spinalbifida b. Congenital dislocation of Hip, Torticollis, c. congenital talipes equinovarus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce/ OSCE		Human Anatomy	
Physical Medicine & Rehabilitation									
PM2.1	Describe the causes of disability in the patient with a cerebrovascular accident	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	General Medicine
PM3.1	Describe and discuss the clinical features, types, evaluation, diagnosis and management of cerebral palsy	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	Pediatrics

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/ SH/P	Core (Y/N)	Teaching- Learning Methods	Assessment Methods	Number required to certify P	Vertical Integration	Horizontal Integration
Pediatrics									
PE32.1	Discuss the genetic basis, risk factors, complications, prenatal diagnosis, management and genetic counselling in Down's Syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy	

10.2 Physiology (CODE: PY)

Table 21. Topics and outcomes

Subjects	Number of topics	Number of outcomes
Physiology	11	139

Table 22. Teaching hours

Lectures (Hours)	Small Group Teaching/ Tutorials/ Integrated learning/ Practical (hours)	Self-directed learning (hours)	Total (hours)
160	310	25	495

Table 23.Details of Competency, Domain, T-L Methods, Assessment methods, Integration

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PHYSIOLOGY									
Topic: 1.General Physiology		Number of competencies: (06)							
PY1.1	Describe the structure and functions of a mammalian cell	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.2	Describe and discuss the principles of homeostasis	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.3	Describe intercellular communication	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.4	Describe apoptosis – programmed cell death	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology	
PY1.5	Describe and discuss transport mechanisms across cell membranes	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.9	Demonstrate the ability to describe and discuss the methods used to demonstrate the functions of the cells and its products, its communications and their applications in Clinical care and research.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
Topic: 2.Haematology		Number of competencies: (13)							
PY1.6	Describe the fluid compartments of the body, its ionic composition & measurements	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY2.1	Describe the composition and functions of blood components	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY2.2	Discuss the origin, forms, variations and functions of plasma proteins	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY2.3	Describe and discuss the synthesis and functions of Haemoglobin and explain its breakdown. Describe variants of haemoglobin	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY2.4	Describe RBC formation (erythropoiesis & its regulation) and its functions	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY2.5	Describe different types of anaemias & Jaundice	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology	Biochemistry
PY2.6	Describe WBC formation (granulopoiesis) and its regulation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY2.10	Define and classify different types of immunity. Describe the development of immunity and its regulation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY2.7	Describe the formation of platelets, functions and variations.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY2.8	Describe the physiological basis of hemostasis and, anticoagulants. Describe bleeding & clotting disorders (Hemophilia, purpura)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology	
PY2.9	Describe different blood groups and discuss the clinical importance of blood grouping, blood banking and transfusion	K	KH	Y	Lecture, Small group discussion, ECE- Visit to blood bank	Written/Viva voce		Pathology	
PY2.11	Estimate Hb, RBC, TLC, RBC indices, DLC, Blood groups, BT/CT	S	SH	Y	DOAP sessions	Practical/OSPE /Viva voce		Pathology	
PY2.12	Describe test for ESR, Osmotic fragility, Hematocrit. Note the findings and interpret the test results etc	K	KH	Y	Demonstration	Written /Viva voce		Pathology	
PY2.13	Describe steps for reticulocyte and platelet count	K	KH	Y	Demonstration sessions	Written /Viva voce		Pathology	
Topic:3. Nerve and Muscle Physiology									
Number of competencies:(19)									
Number of procedures that require certification:(NIL)									
PY3.1	Describe the structure and functions of a neuron and neuroglia; Discuss Nerve Growth Factor & other growth factors/cytokines	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY1.8	Describe and discuss the molecular basis of resting membrane potential and action potential in excitable tissue	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY3.2	Describe the types, functions & properties of nerve fibers	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.3	Describe the degeneration and regeneration in peripheral nerves	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PY3.4	Describe the structure of neuro-muscular junction and transmission of impulses	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Anaesthesiology	
PY3.5	Discuss the action of neuro-muscular blocking agents	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Anaesthesiology, Pharmacology	
PY3.6	Describe the pathophysiology of Myasthenia gravis	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology	
PY3.7	Describe the different types of muscle fibres and their structure	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY3.8	Describe action potential and its properties in different muscle types (skeletal & smooth)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.17	Describe Strength-duration curve	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.9	Describe the molecular basis of muscle contraction in skeletal and in smooth muscles	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.10	Describe the mode of muscle contraction (isometric and isotonic)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.11	Explain energy source and muscle metabolism	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY3.12	Explain the gradation of muscular activity	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PY3.13	Describe muscular dystrophy: myopathies	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Human Anatomy
PY3.14	Perform Ergography	S	SH	Y	DOAP sessions	Practical/OSPE / Viva voce			
PY3.15	Demonstrate effect of mild, moderate and severe exercise and record changes in cardiorespiratory parameters	S	SH	Y	DOAP sessions	Practical/OSPE / Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY3.16	Demonstrate Harvard Step test and describe the impact on induced physiologic parameters in a simulated environment	S	SH	Y	DOAP sessions	Practical/OSPE / Viva voce			
PY3.18	Observe with Computer assisted learning (i) amphibian nerve - muscle experiments (ii) amphibian cardiac experiments	S	KH	Y	Demonstration, Computer assisted learning methods	Practical / Viva voce			
Topic:4.Gastro-intestinalPhysiology									
Number of competencies:(12)									
PY4.1	Describe the structure and functions of digestive system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY4.6	Describe the Gut-Brain Axis	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY4.2	Describe the composition, mechanism of secretion, functions, and regulation of saliva, gastric, pancreatic, intestinal juices and bile secretion	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY3.8	Describe action potential and its properties in different muscle types (skeletal & smooth)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY3.10	Describe the mode of muscle contraction (isometric and isotonic)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY4.3	Describe GIT movements, regulation and functions. Describe defecation reflex. Explain role of dietary fibre.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY4.4	Describe the physiology of digestion and absorption of nutrients	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.5	Describe the source of GIT hormones, their regulation and functions	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY4.7	Describe & discuss the structure and functions of liver and gall bladder	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.8	Describe & discuss gastric function tests, pancreatic exocrine function tests & liver function tests	K	KH	Y	Lecture, Small group discussion, Demonstration	Written/Viva voce			Biochemistry

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY4.9	Discuss the physiology aspects of: peptic ulcer, gastro- oesophageal reflux disease, vomiting, diarrhoea, constipation, Adynamic ileus, Hirschsprung's disease	K	KH	Y	Esophageal Manometry & endoscopy Lecture, Small group discussion	Written/Viva voce		General Medicine	Biochemistry
PY4.10	Demonstrate the correct clinical examination of the abdomen in a normal volunteer or simulated environment	S	SH	Y	DOAP session	Skill assessment/ Viva voce/OSCE			
Topic: 5.Cardiovascular Physiology(CVS)									
Number of competencies:(16)									
Number of procedures that require certification:(03)									
PY5.1	Describe the functional anatomy of heart including chambers, sounds; and Pacemaker tissue and conducting system.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY5.4	Describe generation, conduction of cardiac impulse	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.2	Describe the properties of cardiac muscle including its morphology, electrical, mechanical and metabolic functions	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.6	Describe abnormal ECG, arrhythmias, heart block and myocardial Infarction	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Human Anatomy
PY5.5	Describe the physiology of electrocardiogram(E.C.G), its applications and the cardiacaxis	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PY5.3	Discuss the events occurring during the cardiac cycle	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.7	Describe and discuss haemodynamics of circulatory system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.8	Describe and discuss local and systemic	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
	cardiovascular regulatory mechanisms				group discussion	voce			
PY5.9	Describe the factors affecting heart rate, regulation of cardiac output & blood pressure	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.10	Describe & discuss regional circulation including microcirculation, lymphatic circulation, coronary, cerebral, capillary, skin, foetal, pulmonary and splanchnic circulation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PY5.11	Describe the patho-physiology of shock, syncope and heart failure	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY5.12	Record blood pressure & pulse at rest and in different grades of exercise and postures in a volunteer or simulated environment	S	SH	Y	DOAP sessions	Practical/ OSPE/ Viva voce	1 each x 3		
PY5.13	Record and interpret normal ECG in a volunteer or simulated environment	S	SH	Y	DOAP sessions	Practical/ OSPE/ Viva voce		General Medicine	
PY5.14	Observe cardiovascular autonomic function tests in a volunteer or simulated environment	S	SH	N	DOAP sessions	Skill assessment/ Viva voce			
PY5.15	Demonstrate the correct clinical examination of the cardiovascular system in a normal volunteer or simulated environment	S	SH	Y	DOAP sessions	Practical/ OSPE/ Viva voce			
PY5.16	Record Arterial pulse tracing using finger plethysmography in a volunteer or simulated environment	S	SH	N	DOAP sessions, Computer assisted learning methods	Practical/ OSPE/ Viva voce		General Medicine	
Topic:6.Respiratory Physiology									
Number of competencies:(11)									
Number of procedures that require certification:(01)									
PY6.1	Describe the functional anatomy of respiratory tract	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.2	Describe the mechanics of normal respiration, pressure changes during ventilation, lung volume and capacities, alveolar surface tension,	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
	compliance, airway resistance, ventilation, V/P ratio, diffusion capacity of lungs								
PY6.3	Describe and discuss the transport of respiratory gases: Oxygen and Carbon dioxide	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY ADD	Regulation of respiration - Neural & Chemical	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.4	Describe and discuss the physiology of high altitude and deep sea diving	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.5	Describe and discuss the principles of artificial respiration, oxygen therapy, acclimatization and decompression sickness.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.6	Describe and discuss the pathophysiology of dyspnoea, hypoxia, cyanosis asphyxia; drowning, periodic breathing	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.7	Describe and discuss lung function tests & their clinical significance	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY6.8	Demonstrate the correct technique to perform & interpret Spirometry	S	SH	Y	DOAP sessions	Skill assessment/ Viva voce		Respiratory Medicine	
PY6.9	Demonstrate the correct clinical examination of the respiratory system in a normal volunteer or simulated environment	S	P	Y	DOAP sessions	Skill assessment/ Viva voce/OSCE	1		
PY6.10	Demonstrate the correct technique to perform measurement of peak expiratory flow rate in a normal volunteer or simulated environment	S	SH	Y	DOAP sessions	Practical/OSP E/ Viva voce			
Topic: 7.RenalPhysiology									
Number of competencies:(10)									
Number of procedures that require certification:(NIL)									
PY7.1	Describe structure and function of kidney	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.2	Describe the structure and functions of juxta	K	KH	Y	Lecture, Small	Written/Viva			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
	glomerular apparatus and role of renin-angiotensin system				group discussion	voce			
PY7.3	Describe the mechanism of urine formation involving processes of filtration, tubular reabsorption & secretion; concentration and diluting mechanism	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.4	Describe & discuss the significance & implication of Renal clearance	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.5	Describe the renal regulation of fluid and electrolytes & acid-base balance	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY1.7	Describe the concept of pH & Buffer systems in the body	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY7.6	Describe the innervations of urinary bladder, physiology of micturition and its abnormalities	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.9	Describe cystometry and discuss the normal cystometrogram	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY7.7	Describe artificial kidney, dialysis and renal transplantation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
PY7.8	Describe & discuss Renal Function Tests	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
Topic:8.EndocrinePhysiology									
Number of competencies:(06)						Number of procedures that require certification):(NIL)			
PY8.6	Describe & differentiate the mechanism of action of steroid, protein and amine hormones	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY8.2	Describe the synthesis, secretion, transport, physiological actions, regulation and effect of altered (hypo and hyper) secretion of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas and hypothalamus	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY8.4	Describe function tests: Thyroid gland; Adrenal cortex, Adrenal medulla and pancreas	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PY8.1	Describe the physiology of bone and calcium metabolism	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY8.3	Describe the physiology of Thymus & Pineal Gland	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY8.5	Describe the metabolic and endocrine consequences of obesity & metabolic syndrome, Stress response. Outline the psychiatry component pertaining to metabolic syndrome.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
Topic:9.ReproductivePhysiology									
Number of competencies:(12)									
Number of procedures that require certification:(NIL)									
PY9.1	Describe and discuss sex determination; sex differentiation and their abnormalities and outline psychiatry and practical implication of sex determination.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY9.2	Describe and discuss puberty: onset, progression, stages; early and delayed puberty and outline adolescent clinical and psychological association.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY9.3	Describe male reproductive system: functions of testis and control of spermatogenesis & factors modifying it and outline its association with psychiatric illness	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY9.9	Interpret a normal semen analysis report including (a) sperm count, (b) sperm morphology and (c) sperm motility, as per WHO guidelines and discuss the results	K	KH	Y	Lecture, Small group discussion	OSPE/Viva voce			
PY9.12	Discuss the common causes of infertility in a couple and role of IVF in managing a case of infertility.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics &Gynaecology	
PY9.4	Describe female reproductive system: (a) functions of ovary and its control; (b) menstrual	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
	cycle - hormonal, uterine and ovarian changes								
PY9.7	Describe and discuss the effects of removal of gonads on physiological functions	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY9.5	Describe and discuss the physiological effects of sex hormones	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY9.6	Enumerate the contraceptive methods for male and female. Discuss their advantages & disadvantages	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics &Gynaecology, Community Medicine	
PY9.8	Describe and discuss the physiology of pregnancy, parturition & lactation and outline the psychology and psychiatry-disorders associated with it.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology	
PY9.10	Discuss the physiological basis of various pregnancy tests	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology	
PY9.11	Discuss the hormonal changes and their effects during perimenopause and menopause	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics &Gynaecology	
PY 9.12	Common causes of infertility and role of IVF	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Obstetrics & Gynaecology	
Topic:10.Neurophysiology									
Number of competencies:(23)									
PY10.1	Describe and discuss the organization of nervous system	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY3.1	Describe the structure and functions of a neuron and neuroglia; Discuss Nerve Growth Factor & other growth factors/cytokines	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.2	Describe and discuss the functions and properties of synapse, reflex, receptors	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.3	Describe and discuss somatic sensations & sensory tracts	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.4	Describe and discuss motor tracts, mechanism of	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
	maintenance of tone, control of body movements, posture and equilibrium & vestibular apparatus				group discussion	voce			Anatomy
PY10.5	Describe and discuss structure and functions of reticular activating system, autonomic nervous system (ANS)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.6	Describe and discuss Spinal cord, its functions, lesion & sensory disturbances	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Human Anatomy
PY10.7	Describe and discuss functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system and their abnormalities	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	Human Anatomy
PY10.8	Describe and discuss behavioural and EEG characteristics during sleep and mechanism responsible for its production	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	
PY10.12	Identify normal EEG forms	S	S	Y	Small group teaching	OSPE/Viva voce		Psychiatry	
PY10.9	Describe and discuss the physiological basis of memory, learning and speech	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Psychiatry	
PY10.10	Describe and discuss chemical transmission in the nervous system. (Outline the psychiatry element).	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY10.11	Demonstrate the correct clinical examination of the nervous system: Higher functions, sensory system, motor system, reflexes, cranial nerves in a normal volunteer or simulated environment	S	P	Y	DOAP sessions	Skill assessment/ Viva voce/OSCE	1each (total5)		Human Anatomy
PY10.13	Describe and discuss perception of smell and taste sensation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		ENT	
PY10.14	Describe and discuss patho-physiology of altered smell and taste sensation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		ENT	
PY10.15	Describe and discuss functional anatomy of ear	K	KH	Y	Lecture, Small	Written/Viva		ENT	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
	and auditory pathways & physiology of hearing				group discussion	voce			
PY10.16	Describe and discuss pathophysiology of deafness. Describe hearing tests	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		ENT	
PY10.19	Describe and discuss auditory & visual evoke potentials	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Ophthalmology	
PY10.17	Describe and discuss functional anatomy of eye, physiology of image formation, physiology of vision including colourvision, refractive errors, colour blindness, physiology of pupil and light reflex	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Ophthalmology	
PY10.18	Describe and discuss the physiological basis of lesion in visual pathway	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Ophthalmology	
PY10.19	Describe and discuss auditory & visual evoke potentials	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		ENT	
PY10.20	Demonstrate (i) Testing of visual acuity, colour and field of vision and (ii) hearing (iii) Testing for smell and (iv) taste sensation in volunteer/ simulated environment	S	P	Y	DOAP sessions	Skill assessment/ Viva voce	1each (total4)	ENT, Ophthalmology	
PY ADD	CSF, blood – brain barrier.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
Topic:11. Integrated Physiology									
Number of competencies:(14)									
Number of procedures that require certification:(NIL)									
PY11.1	Describe and discuss mechanism of temperature regulation	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.2	Describe and discuss adaptation to altered temperature (heat and cold)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.3	Describe and discuss mechanism of fever, cold injuries and heat stroke	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.8	Discuss & compare cardio-respiratory changes in exercise (isometric and isotonic) with that in the resting state and under different	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
	environmental conditions (heat and cold)								
PY11.4	Describe and discuss cardio-respiratory and metabolic adjustments during exercise; physical training effects	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.5	Describe and discuss physiological consequences of sedentary lifestyle	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.6	Describe physiology of Infancy	K	KH	N	Lecture, Small group discussion	Written/Viva voce		Pediatrics	
PY11.9	Interpret growth charts	K	KH	N	Small group teaching	Practical/OSP E/ Viva voce		Pediatrics	
PY11.10	Interpret anthropometric assessment of infants	K	KH	N	Small group teaching	Practical/OSP E/ Viva voce		Pediatrics	
PY11.7	Describe and discuss physiology of aging; free radicals and antioxidants	K	KH	N	Lecture, Small group discussion	Written/Viva voce			
PY11.11	Discuss the concept, criteria for diagnosis of Brain death and its implications	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
PY11.12	Discuss the physiological effects of meditation	K	KH	N	Lecture, Small group discussion	Written/Viva voce			
PY11.13	Obtain history and perform general examination in the volunteer / simulated environment	S	SH	Y	DOAP sessions	Skill assessment/ Viva voce			
PY11.14	Demonstrate Basic Life Support in a simulated environment	S	SH	Y	DOAP sessions	OSCE		General Medicine, Anesthesiology	
Column C: K- Knowledge, S – Skill, A - Attitude / professionalism, C- Communication. Column D: K – Knows, KH - Knows How, SH - Shows how, P- performs independently, Column F: DOAP session – Demonstrate, Observe, Assess, Perform.									
Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation									
Integration									
Human Anatomy									
AN3.1	Classify muscle tissue according to structure & action	K	KH	Y	Lecture	Written/ Viva voce			Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN5.1	Differentiate between blood vascular and lymphatic system	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN5.2	Differentiate between pulmonary and systemic circulation	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN5.6	Describe the concept of anastomoses and collateral circulation with significance of end-arteries	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN5.7	Explain function of meta-arterioles, precapillary sphincters, arterio- venous anastomoses	K	KH	N	Lecture	Written			Physiology
AN5.8	Define thrombosis, infarction & aneurysm	K	KH	N	Lecture	Written		Pathology	Physiology ¹
AN7.2	List components of nervous tissue and their functions	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN7.3	Describe parts of a neuron and classify them based on number of neurites, size & function	K	KH	Y	Lecture	Written/ Viva voce			Physiology
AN7.5	Describe principles of sensory and motor innervation of muscles	K	KH	N	Lecture	Written		General Medicine	Physiology
AN7.7	Describe various types of synapse	K	KH	N	Lecture	Written			Physiology
AN21.9	Describe & demonstrate mechanics and types of respiration	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/Viva voce/ skill assessment			Physiology
AN22.2	Describe & demonstrate external and internal features of each chamber of heart	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/Viva voce/ skill assessment			Physiology
AN22.3	Describe & demonstrate origin, course and branches of coronary arteries	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/Viva voce/ skill assessment			Physiology
AN22.4	Describe anatomical basis of ischaemic heart	K	KH	Y	Lecture	Written/ Viva		General	Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
	disease					voce		Medicine	
AN22.7	Mention the parts, position and arterial supply of the conducting system of heart	K	KH	Y	Lecture	Written		General Medicine	Physiology
AN24.1	Mention the blood supply, lymphatic drainage and nerve supply of pleura, extent of pleura and describe the pleural recesses and their applied anatomy	K	KH	Y	Practical, Lecture	Written/ Viva voce		General Medicine	Physiology
AN24.2	Identify side, external features and relations of structures which form root of lung & bronchial tree and their clinical correlate	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology
AN24.3	Describe a bronchopulmonary segment	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN25.3	Describe fetal circulation and changes occurring at birth	K	KH	Y	Lecture	Written		General Medicine	Physiology
AN25.4	Describe embryological basis of: 1) atrial septal defect, 2) ventricular septal defect, 3) Fallot's tetralogy & 4) tracheo-oesophageal fistula	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology
AN25.5	Describe developmental basis of congenital anomalies, transposition of great vessels, dextrocardia, patent ductus arteriosus and coarctation of aorta	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics	Physiology
AN25.9	Demonstrate surface marking of lines of pleural reflection, Lung borders and fissures, Trachea, Heart borders, Apex beat & Surface projection of valves of heart	K/S	SH	Y	Practical	Viva voce/ skill assessment		General Medicine, Pediatrics	Physiology
AN56.2	Describe circulation of CSF with its applied anatomy	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN57.4	Enumerate ascending & descending tracts at mid thoracic level of spinal cord	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN57.5	Describe anatomical basis of syringomyelia	K	KH	N	Lecture	Written		General	Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN58.3	Enumerate cranial nerve nuclei in medulla oblongata with their functional group	K	KH	Y	Lecture	Written/ Viva voce		Medicine	Physiology
AN58.4	Describe anatomical basis & effects of medial & lateral medullary syndrome	K	KH	N	Lecture	Written		General Medicine	Physiology
AN59.1	Identify external features of pons	K/S	SH	Y	Lecture, DOAP session	Written/ Viva voce/ skill assessment			Physiology
AN60.3	Describe anatomical basis of cerebellar dysfunction	K	KH	N	Lecture	Written		General Medicine	Physiology
AN61.3	Describe anatomical basis & effects of Benedikt's and Weber's syndrome	K	KH	N	Lecture	Written		General Medicine	Physiology
AN62.2	Describe & demonstrate surfaces, sulci, gyri, poles, & functional areas of cerebral hemisphere	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology
AN62.3	Describe the white matter of cerebrum	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.4	Enumerate parts & major connections of basal ganglia & limbic lobe	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.5	Describe boundaries, parts, gross relations, major nuclei and connections of dorsal thalamus, hypothalamus, epithalamus, metathalamus and subthalamus	K	KH	Y	Lecture	Written/ Viva voce		General Medicine	Physiology
AN62.6	Describe & identify formation, branches & major areas of distribution of circle of Willis	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment		General Medicine	Physiology
AN63.1	Describe & demonstrate parts, boundaries & features of IIIrd, IVth & lateral ventricle	K/S	SH	Y	Practical, Lecture, Small group discussion, DOAP session	Written/ Viva voce/ skill assessment			Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
AN63.2	Describe anatomical basis of congenital hydrocephalus	K	KH	N	session Lecture	Written		Pediatrics	Physiology
AN66.1	Describe & identify various types of connective tissue with functional correlation	K/S	SH	Y	Lecture, Practical	Written/ skill assessment			Physiology
AN67.2	Classify muscle and describe the structure-function correlation of the same	K	KH	Y	Lecture, Practical	Written			Physiology
AN68.2	Describe the structure-function correlation of neuron	K	KH	Y	Lecture, Practical	Written			Physiology
AN69.2	Describe the various types and structure-function correlation of blood vessel	K	KH	Y	Lecture, Practical	Written			Physiology
Biochemistry									
BI1.1	Describe the molecular and functional organization of a cell and its sub-cellular components.	K	KH	Y	Lecture, Small group discussions	Written assessment and Viva voce			Physiology
BI3.7	Describe the common poisons that inhibit crucial enzymes of carbohydrate metabolism (eg; fluoride, arsenate)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Physiology
BI5.2	Describe and discuss functions of proteins and structure-function relationships in relevant areas eg, hemoglobin and selected hemoglobinopathies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.3	Describe the common disorders associated with nucleotide metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Physiology
BI6.7	Describe the processes involved in maintenance of normal pH, water & electrolyte balance of body fluids and the derangements associated with these.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Physiology
BI6.9	Describe the functions of various minerals in the body, their metabolism and homeostasis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Physiology

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
BI6.11	Describe the functions of haem in the body and describe the processes involved in its metabolism and describe porphyrin metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.12	Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.13	Describe the functions of the kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.14	Describe the tests that are commonly done in clinical practice to assess the functions of these organs (kidney, liver, thyroid and adrenal glands).	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.15	Describe the abnormalities of kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI10.4	Describe & discuss innate and adaptive immune responses, self/non-self recognition and the central role of T-helper cells in immune responses.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	Physiology
BI11.4	Perform urine analysis to estimate and determine normal and abnormal constituents	S	P	Y	DOAP session	Skill assessment	1	General Medicine	Physiology
Pathology									
PA26.3	Define and describe the etiology, types, pathogenesis, stages, morphology and complications and evaluation of Obstructive airway disease (OAD) and bronchiectasis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	Microbiology
PA27.3	Describe the etiology, types, stages pathophysiology pathology and complications of heart failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Physiology	
PA27.8	Interpret abnormalities in cardiac function	S	SH	Y	DOAP session	Skill		Physiology,	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
	testing in acute coronary syndromes					Assessment		General Medicine	
PA27.9	Classify and describe the etiology, types, pathophysiology, pathology, gross and microscopic features, diagnosis and complications of cardiomyopathies	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Physiology	
PA28.5	Define and classify glomerular diseases. Enumerate and describe the etiology, pathogenesis, mechanisms of glomerular injury, pathology, distinguishing features and clinical manifestations of glomerulonephritis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.1	Enumerate, classify and describe the etiology, pathogenesis, pathology and iodine dependency of thyroid swellings	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
PA32.2	Describe the etiology, cause, iodine dependency, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.3	Describe the etiology, pathogenesis, manifestations, laboratory and imaging features and course of thyrotoxicosis/ hypothyroidism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.4	Classify and describe the epidemiology, etiology, pathogenesis, pathology, clinical laboratory features, complications and progression of diabetes mellitus	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.5	Describe the etiology, genetics, pathogenesis, manifestations, laboratory and morphologic features of hyperparathyroidism	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PA32.7	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of adrenal insufficiency	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.8	Describe the etiology, pathogenesis, manifestations, laboratory, morphologic features, complications of Cushing's syndrome	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, General Medicine	
PA32.9	Describe the etiology, pathogenesis, manifestations, laboratory and morphologic features of adrenal neoplasms	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Human Anatomy, Physiology, General Medicine, General Surgery	
Pharmacology									
PH1.15	Describe mechanism/s of action, types, doses, side effects, indications and contraindications of skeletal muscle relaxants	K	KH	Y	Lecture	Written/ Viva voce		Anesthesiology, Physiology	
PH1.19	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act on CNS, (including anxiolytics, sedatives & hypnotics, antipsychotic, antidepressant drugs, anti-maniacs, opioid agonists and antagonists, drugs used for neurodegenerative disorders, antiepileptics Drugs)	K	KH	Y	Lecture	Written/ Viva voce		Psychiatry, Physiology	
PH1.25	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs acting on blood, like anticoagulants, antiplatelets, fibrinolytics, plasma expanders	K	KH	Y	Lecture	Written/ Viva voce		Physiology, General Medicine	
PH1.26	Describe mechanisms of action, types, doses, side effects, indications and contraindications of	K	KH	Y	Lecture	Written/ Viva voce		Physiology, General	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
	the drugs modulating the renin angiotensin and aldosterone system							Medicine	
PH1.35	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in hematological disorders like: 1. Drugs used in anemias 2. Colony Stimulating factors	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Physiology	Pharmacology
Forensic Medicine & Toxicology									
FM14.7	Demonstrate & identify that a particular stain is blood and identify the species of its origin.	S	KH	Y	Small group discussion, Lecture	Log book/ skill station/ Viva voce		Pathology, Physiology	
FM14.8	Demonstrate the correct technique to perform and identify ABO & Rh blood group of a person.	S	SH	Y	Small group discussion, DOAP session	Log book/ skill station/ Viva voce		Pathology, Physiology	
Anesthesiology									
AS7.3	Observe and describe the management of an unconscious patient	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Physiology	General Medicine
AS7.4	Observe and describe the basic setup process of a ventilator	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Physiology	General Medicine
AS8.1	Describe the anatomical correlates and physiologic principles of pain	K	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Human Anatomy, Physiology	
AS8.2	Elicit and determine the level, quality and quantity of pain and its tolerance in patient or surrogate	S	KH	Y	Lecture, Small group discussion, DOAP session	Written/ Viva voce		Physiology	
Ophthalmology									
OPI.1	Describe the physiology of vision.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
General Medicine									
IM1.1	Describe and discuss the epidemiology, pathogenesis clinical evolution and course of common causes of heart disease including: rheumatic/ valvular, ischemic, hypertrophic inflammatory.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.2	Describe and discuss the genetic basis of some forms of heart failure	K	KH	N	Lecture, Small group discussion	Written		Pathology, Physiology	
IM1.3	Describe and discuss the aetiology microbiology pathogenies and clinical evolution of rheumatic fever, criteria, degree of rheumatic activity and rheumatic valvular heart disease and its complications including infective endocarditis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology, Microbiology	
IM1.4	Stage heart failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.5	Describe discuss and differentiate the processes involved in R Vs L heart failure, systolic vs diastolic failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.6	Describe and discuss the compensatory mechanisms involved in heart failure including cardiac remodelling and neurohormonal adaptations	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.7	Enumerate, describe and discuss the factors that exacerbate heart failure including ischemia, arrhythmias anemia, thyrotoxicosis, dietary factors drugs etc.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM1.8	Describe and discuss the pathogenesis and development of common arrhythmias involved in heart failure particularly atrial fibrillation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM2.1	Discuss and describe the epidemiology, antecedents and risk factors for atherosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
	and ischemic heart disease							Community Medicine	
IM2.2	Discuss the aetiology of risk factors both modifiable and non-modifiable of atherosclerosis and IHD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM2.3	Discuss and describe the lipid cycle and the role of dyslipidemia in the pathogenesis of atherosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
IM2.4	Discuss and describe the pathogenesis, natural history, evolution and complications of atherosclerosis and IHD	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM5.1	Describe and discuss the physiologic and biochemical basis of hyperbilirubinemia	K	K	Y	Lecture, Small group discussion	Written/Viva voce		Pathology, Physiology	
IM5.2	Describe and discuss the aetiology and pathophysiology of liver injury	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM8.1	Describe and discuss the epidemiology, aetiology and the prevalence of primary and secondary hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM8.2	Describe and discuss the pathophysiology of hypertension	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM11.22	Enumerate the causes of hypoglycaemia and describe the counter hormone response and the initial approach and treatment.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM12.1	Describe the epidemiology and pathogenesis of hypothyroidism and hyperthyroidism including the influence of iodine deficiency and autoimmunity in the pathogenesis of thyroid disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM12.3	Describe and discuss the physiology of the hypothalamic-pituitary - thyroid axis, principles of thyroid function testing and alterations in physiologic function	K	K	Y	Lecture, Small group discussion	short notes		Pathology, Physiology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
IM15.3	Describe and discuss the physiologic effects of acute blood and volume loss	K	K	Y	Lecture, Small group discussions	short note/ Viva voce		Pathology, Physiology	General Surgery
IM18.6	Distinguish the lesion based on upper vs lower motor neuron, side, site and most probable nature of the lesion	K/S	SH	Y	Bedside clinic, DOAP session	Skill Assessment		Physiology	
IM18.7	Describe the clinical features and distinguish, based on clinical examination, the various disorders of speech	K/S	SH	N	Bedside clinic, DOAP session	Skill Assessment		Physiology	
IM18.8	Describe and distinguish, based on the clinical presentation, the types of bladder dysfunction seen in CNS disease	K	KH	Y	Small group discussion, Bedside clinic	Written/ Viva voce		Physiology	
IM19.1	Describe the functional anatomy of the locomotor system of the brain	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Human Anatomy, Physiology	
IM22.1	Enumerate the causes of hypercalcemia and distinguish the features of PTH vs non PTH mediated hypercalcemia	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
IM22.9	Enumerate the causes and describe the clinical and laboratory features of metabolic acidosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM22.10	Enumerate the causes of describe the clinical and laboratory features of metabolic alkalosis	K	KH	N	Lecture, small group discussion	Written/ Viva voce		Physiology	
IM22.11	Enumerate the causes and describe the clinical and laboratory features of respiratory acidosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM22.12	Enumerate the causes and describe the clinical and laboratory features of respiratory alkalosis	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM22.13	Identify the underlying acid based disorder based on an ABG report and clinical situation	S	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology	
IM23.1	Discuss and describe the methods of nutritional assessment in an adult and calculation of caloric requirements during illnesses	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.2	Discuss and describe the causes and consequences of protein caloric malnutrition in	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
	the hospital								
IM23.3	Discuss and describe the aetiology, causes, clinical manifestations, complications, diagnosis and management of common vitamin deficiencies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.4	Enumerate the indications for enteral and parenteral nutrition in critically ill patients	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM24.22	Describe and discuss the aetiopathogenesis, clinical presentation, complications, assessment and management of nutritional disorders in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
Obstetrics & Gynaecology									
OG3.1	Describe the physiology of ovulation, menstruation, fertilization, implantation and gametogenesis	K	K	Y	Lecture, seminars	Theory		Physiology	
OG7.1	Describe and discuss the changes in the genital tract, cardiovascular system, respiratory, haematology, renal and gastrointestinal systems in pregnancy	K	KH	Y	Lecture, seminars	Theory		Physiology	
Pediatrics									
PE7.2	Explain the physiology of lactation	K	KH	Y	Lecture, small group discussion	Written/ Viva voce		Physiology	
PE7.3	Describe the composition and types of breast milk and discuss the differences between cow's milk and human milk	K	KH	Y	Lecture, debate	Written/ Viva voce		Physiology	
PE10.1	Define, describe the etio-pathogenesis, classify including WHO classification, clinical features, complication and management of severe Acute Malnourishment and Moderate Acute Malnutrition	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Biochemistry	
PE10.2	Outline the clinical approach to a child with SAM and MAM	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
PE10.3	Assessment of a patient with SAM and MAM, diagnosis, classification and planning management including hospital and community based intervention, rehabilitation and prevention	S	SH	Y	Bed side clinics, Skill Lab	Skill station		Physiology, Biochemistry	
PE11.1	Describe the common etiology, clinical features and management of Obesity in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry, Pathology	
PE11.2	Discuss the risk approach for obesity and discuss the prevention strategies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
PE12.7	Describe the causes, clinical features, diagnosis and management of Deficiency / excess of Vitamin D (Rickets and Hypervitaminosis D	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.8	Identify the clinical features of dietary deficiency of Vitamin D	S	P	Y	Bedside clinics, Skills lab	Document in log book	3	Biochemistry, Physiology Pathology	
PE12.9	Assess patients with Vitamin D deficiency, diagnose, classify and plan management	S	SH	Y	Bed side clinics	Document in log book		Biochemistry, Physiology, Pathology	
PE12.13	Discuss the RDA, dietary sources of Vitamin K and their role in health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.14	Describe the causes, clinical features, diagnosis, management and prevention of Deficiency of Vitamin K	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE23.1	Discuss the Hemodynamic changes, clinical presentation, complications and management of Acyanotic Heart Diseases–VSD, ASD and PDA	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	
PE23.2	Discuss the Hemodynamic changes, clinical presentation, complications and management of Cyanotic Heart Diseases – Fallot’s Physiology	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	
PE23.3	Discuss the etio-pathogenesis, clinical presentation and management of cardiac failure	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
	in infant and children								
PE23.4	Discuss the etio-pathogenesis, clinical presentation and management of Acute Rheumatic Fever in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	
PE23.5	Discuss the clinical features, complications, diagnosis, management and prevention of Acute Rheumatic Fever	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology Pathology	
PE23.6	Discuss the etio-pathogenesis and clinical features and management of Infective endocarditis in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology, Microbiology	
PE29.1	Discuss the etio-pathogenesis, Clinical features, classification and approach to a child with anaemia	K	KH	Y	Lecture, Small group discussions	Written/ Viva voce		Pathology, Physiology	
PE29.2	Discuss the etio-pathogenesis, clinical features and management of Iron Deficiency anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
PE29.3	Discuss the etio-pathogenesis, Clinical features and management of VIT B12, Folate deficiency anaemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
PE29.4	Discuss the etio-pathogenesis, clinical features & management of Hemolytic anemia, Thalassemia Major, Sickle cell anaemia, Hereditary spherocytosis, Auto-immune hemolytic anaemia and hemolytic uremic syndrome	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology Physiology	
General Surgery									
SU1.1	Describe basic concepts of homeostasis, enumerate the metabolic changes in injury and their mediators	K	KH	Y	Lecture, Bed side clinic and Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
SU2.1	Describe Pathophysiology of shock. Types of shock. Principles of resuscitation including fluid replacement and monitoring	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Physiology	
SU4.1	Elicit, document and present history in a case of Burns and perform physical examination.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology	

Number	COMPETENCY The student should be able to:	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical Integration	Horizontal Integration
	Describe Pathophysiology of Burns.								
SU12.1	Enumerate the causes and consequences of malnutrition in the surgical patient.	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce		Physiology	
SU12.2	Describe and Discuss the methods of estimation and replacement the Fluid and electrolyte requirements in the surgical patient	K	KH	Y	Lecture, Small group discussion, Bedside clinic	Written/ Viva voce		Physiology	
SU28.5	Describe the applied Anatomy and physiology of esophagus	K	K	Y	Lecture, Small group Discussion, Demonstration	Written/ Viva voce		Human Anatomy, Physiology	
Respiratory Medicine									
CT2.1	Define and classify obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.2	Describe and discuss the epidemiology risk factors and evolution of obstructive airway disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.4	Describe and discuss the physiology and pathophysiology of hypoxia and hypercapnia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.5	Describe and discuss the genetics of alpha 1 antitrypsin deficiency in emphysema	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Physiology, Pathology	
CT2.11	Describe, discuss and interpret pulmonary function tests	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Physiology, Pathology	

10.3 Biochemistry (CODE: BI)

Table 24. Topics and outcomes

Subjects	Number of topics	Number of outcomes
Biochemistry	11	89

Table 25. Teaching hours

Lectures (Hours)	Small Group Teaching/ Tutorials/ Integrated learning/ Practical (hours)	Self-directed learning (hours)	Total (hours)
80	150	20	250

Table 26. Details of Competency, Domain, T-L Methods, Assessment methods, Integration

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
Topic: 1. Basic Biochemistry									
Number of competencies: (01)									
B11.1	Describe the molecular and functional organization of a cell and its sub-cellular components.	K	KH	Y	Lecture, Small group discussion	Written assessment/ Viva voce			Physiology
Topic: 2. Enzyme									
Number of competencies: (07)									
B12.1	Explain fundamental concepts of enzyme, isoenzyme, alloenzyme, coenzyme & co-factors. Enumerate the main classes of IUBMB nomenclature.	K	KH	Y	Lecture, case discussion	Written assessment/ Viva voce			
B12.2	Observe the estimation of SGOT & SGPT	K	K	Y	Demonstration	Viva voce			
B12.3	Describe and explain the basic principles of enzyme activity	K	KH	Y	Lecture, case discussion	Written/ Viva voce			
B12.4	Describe and discuss enzyme inhibitors as poisons and drugs and as therapeutic enzymes	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	
B12.5	Describe and discuss the clinical utility of various serum enzymes as markers of pathological conditions.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	
B12.6	Discuss use of enzymes in laboratory investigations (Enzyme-based assays)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	
B12.7	Interpret laboratory results of enzyme activities & describe the clinical utility of various enzymes as markers of pathological conditions.	K	KH	Y	Lecture, Small group discussion, DOAP sessions	Written/ Viva voce		Pathology, General Medicine	
Topic: 3. Chemistry and Metabolism of Carbohydrates									
Number of competencies: (10)									
Number of procedures that require certification: (NIL)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI3.1	Discuss and differentiate monosaccharides, disaccharides and polysaccharides giving examples of main carbohydrates as energy fuel, structural element and storage in the human body	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
BI3.2	Describe the processes involved in digestion and assimilation of carbohydrates and storage.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
BI3.3	Describe and discuss the digestion and assimilation of carbohydrates from food.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
BI3.4	Define and differentiate the pathways of carbohydrate metabolism, (glycolysis, gluconeogenesis, glycogen metabolism, HMP shunt).	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
BI3.5	Describe and discuss the regulation, functions and integration of carbohydrate along with associated diseases/disorders.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
BI3.6	Describe and discuss the concept of TCA cycle as a amphibolic pathway and its regulation.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			
BI3.7	Describe the common poisons that inhibit crucial enzymes of carbohydrate metabolism (eg; fluoride, arsenate)	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Physiology
BI3.8	Discuss and interpret laboratory results of analytes associated with metabolism of carbohydrates.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		Pathology, General Medicine	
BI3.9	Discuss the mechanism and significance of blood glucose regulation in health and disease.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
BI3.10	Interpret the results of blood glucose levels and other laboratory investigations related to disorders of carbohydrate metabolism.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
Topic: 4. Chemistry and Metabolism of Lipids		Number of competencies: (07)		Number of procedures that require certification: (NIL)					
BI4.1	Describe and discuss main classes of lipids (Essential/non-essential fatty acids, cholesterol and hormonal steroids, triglycerides, major phospholipids and sphingolipids) relevant to human system and their major functions.	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	
BI4.2	Describe the processes involved in digestion and absorption of dietary lipids and also the key features of their metabolism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.3	Explain the regulation of lipoprotein metabolism & associated disorders.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.4	Describe the structure and functions of lipoproteins, their functions, interrelations & relations with atherosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.5	Interpret laboratory results of analytes associated with metabolism of lipids	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.6	Describe the therapeutic uses of prostaglandins and inhibitors of eicosanoid synthesis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI4.7	Interpret laboratory results of analytes associated with metabolism of lipids.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: 5. Chemistry and Metabolism of Proteins		Number of competencies: (05)		Number of procedures that require certification: (NIL)					
BI5.1	Describe and discuss structural organization of proteins.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI5.2	Describe and discuss functions of proteins and structure-function relationships in relevant areas eg, hemoglobin and selected hemoglobinopathies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI5.3	Describe the digestion and absorption of dietary proteins.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI5.4	Describe common disorders associated with protein metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
BI5.5	Interpret laboratory results of analytes associated with metabolism of proteins.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Topic: 6. Metabolism and homeostasis		Number of competencies that require certification: (NIL)							
BI6.1	Discuss the metabolic processes that take place in specific organs in the body in the fed and fasting states.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.2	Describe and discuss the metabolic processes in which nucleotides are involved.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI6.3	Describe the common disorders associated with nucleotide metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			Physiology
BI6.4	Discuss the laboratory results of analytes associated with gout & Lesch Nyhan syndrome.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.5	Describe the biochemical role of vitamins in the body and explain the manifestations of their deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.6	Describe the biochemical processes involved in generation of energy in cells.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI6.7	Describe the processes involved in maintenance of normal pH, water & electrolyte balance of body fluids and the derangements associated with these.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Physiology
BI6.8	Discuss and interpret results of Arterial Blood Gas (ABG) analysis in various disorders.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.9	Describe the functions of various minerals in the body, their metabolism and homeostasis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	Physiology
BI6.10	Enumerate and describe the disorders associated with mineral metabolism.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI6.11	Describe the functions of haem in the body and	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology,	Physiology

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
	describe the processes involved in its metabolism and describe porphyrin metabolism.				group discussion	voce		General Medicine	
BI6.12	Describe the major types of haemoglobin and its derivatives found in the body and their physiological/ pathological relevance.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology
BI6.13	Describe the functions of the kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.14	Describe the tests that are commonly done in clinical practice to assess The functions of these organs(kidney, liver, thyroid and adrenal glands).	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
BI6.15	Describe the abnormalities of kidney, liver, thyroid and adrenal glands.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, General Medicine	Physiology, Human Anatomy
	Topic:7.Molecularbiology	Number of competencies:(07)							
BI7.1	Describe the structure and functions of DNA and RNA and outline the cell cycle.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI7.2	Describe the processes involved in replication & repair of DNA and the transcription& translation mechanisms.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI7.3	Describe gene mutations and basic mechanism of regulation of gene expression.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics	
BI7.4	Describe applications of molecular technologies like recombinant DNA technology, PCR in the diagnosis and treatment of diseases with genetic basis.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pediatrics, General Medicine	
BI7.5	Describe the role of xenobiotics in disease	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI7.6	Describe the anti-oxidant defence systems in the body.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI7.7	Describe the role of oxidative stress in the	K	KH	Y	Lecture, Small	Written/ Viva		General	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
	pathogenesis of conditions such as cancer, complications of diabetes mellitus and atherosclerosis.				group discussion	voce		Medicine, Pathology	
	Topic: 8.Nutrition	Number of competencies:(05)			Number of procedures that require certification:(NIL)				
BI8.1	Discuss the importance of various dietary components and explain importance of dietary fibre.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Pathology	
BI8.2	Describe the types and causes of protein energy malnutrition and its effects.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Pathology	
BI8.3	Provide dietary advice for optimal health in childhood and adult, in disease conditions like diabetes mellitus, coronary artery disease and in pregnancy.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI8.4	Describe the causes (including dietary habits), effects and health risks associated with being overweight/ obesity.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	
BI8.5	Summarize the nutritional importance of commonly used items of food including fruits and vegetables. (macro-molecules & its importance)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, General Medicine, Pediatrics	
	Topic: 9. Extracellular Matrix	Number of competencies:(03)			Number of procedures that require certification:(NIL)				
BI9.1	List the functions and components of the extracellular matrix (ECM).	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI9.2	Discuss the involvement of ECM components in health and disease.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI9.3	Describe protein targeting & sorting along with its associated disorders.	K	KH	N	Lecture, Small group discussion	Written/ Viva voce			
Topic: 10. Oncogenesis and immunity									
Number of competencies:(05)									
BI10.1	Describe the cancer initiation, promotion oncogenes & oncogene activation. Also focus on p53 & apoptosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.2	Describe various biochemical tumor markers and the biochemical basis of cancer therapy.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.3	Describe the cellular and humoral components of the immune system & describe the types and structure of antibody	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	
BI10.4	Describe & discuss innate and adaptive immune responses, self/non-self-recognition and the central role of T-helper cells in immune responses.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Obstetrics & Gynaecology, General Surgery, Pathology	Physiology
BI10.5	Describe antigens and concepts involved in vaccine development.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Pediatrics, Microbiology	
Topic: 11. Biochemical Laboratory Tests									
Number of competencies:(24)									
BI11.1	Describe commonly used laboratory apparatus and equipments, good safe laboratory practice and waste disposal.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
Number of procedures that require certification:(05)									

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI11.2	Describe the preparation of buffers and estimation of pH.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.3	Describe the chemical components of normal urine.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.4	Perform urine analysis to estimate and determine normal and abnormal constituents	S	P	Y	DOAP session	Skill assessment	1	General Medicine	Physiology
BI11.5	Describe screening of urine for inborn errors & describe the use of paper chromatography	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI11.6	Describe the principles of colorimetry	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.7	Demonstrate the estimation of serum creatinine and creatinine clearance	S	P	Y	Practical	Skills assessment	1		
BI11.8	Demonstrate estimation of serum proteins, albumin and A:G ratio	S	P	Y	Practical	Skills assessment	1		
BI11.9	Demonstrate the estimation of serum total cholesterol and HDL- cholesterol	S	P	Y	Practical	Skills assessment			
BI11.10	Demonstrate the estimation of triglycerides	S	P	Y	Practical	Skills assessment			
BI11.11	Demonstrate estimation of calcium and phosphorous	S	P	Y	Practical	Skills assessment			
BI11.12	Demonstrate the estimation of serum bilirubin	S	P	Y	Practical	Skills assessment			
BI11.13	Demonstrate the estimation of SGOT/ SGPT	S	P	Y	Practical	Skills assessment			
BI11.14	Demonstrate the estimation of alkaline phosphatase	S	P	Y	Practical	Skills assessment			
BI11.15	Describe & discuss the composition of CSF	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.16	Observe use of commonly used equipments/techniques in biochemistry laboratory including:	S	KH	Y	Demonstration	Skill assessment			

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
	<ul style="list-style-type: none"> • pHmeter • Paper chromatography of amino acid • Protein electrophoresis • TLC, PAGE • Electrolyte analysis by ISE • ABG analyzer • ELISA • Immuno diffusion • Autoanalyser • Quality control • DNA isolation from blood/ tissue 								
BI11.17	<p>Explain the basis and rationale of biochemical tests done in the following conditions:</p> <ul style="list-style-type: none"> • Diabetesmellitus, • dyslipidemia, • myocardialinfarction, • renal failure,gout, • proteinuria, • nephroticsyndrome, • edema, • jaundice, • liverdiseases,pancreatitis, • disordersofacid- basebalance, thyroiddisorders. 	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pathology	
BI11.18	Discuss the principles of spectrophotometry.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.19	Outline the basic principles involved in the functioning of instruments commonly used in a biochemistry laboratory and their applications.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce			
BI11.20	Identify abnormal constituents in urine, interpret the findings and correlate these with pathological states.	S	SH	Y	DOAP sessions	Skill assessment	1		

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
BI11.21	Demonstrate estimation of glucose, creatinine, urea and total protein in serum.	S	SH	Y	DOAP sessions	Skill assessment	1		
BI11.22	Calculate albumin: globulin (AG) ratio and creatinine clearance	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI11.23	Calculate energy content of different food items, identify food items with high and low glycemic index and explain the importance of these in the diet	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
BI11.24	Enumerate advantages and/or disadvantages of use of unsaturated, saturated and trans fats in food.	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine	
Column C: K-Knowledge, S-Skill, A-Attitude/professionalism, C-Communication. Column D: K-Knows, KH-Knows How, SH-Shows how, P-performs independently, Column F: DOAP session – Demonstrate, Observe, Assess, Perform.									
Column H: If entry is P: indicate how many procedures must be done independently for certification/ graduation									
Integration									
Physiology									
PY3.11	Explain energy source and muscle metabolism	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.2	Describe the composition, mechanism of secretion, functions, and regulation of saliva, gastric, pancreatic, intestinal juices and bile secretion	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.4	Describe the physiology of digestion and absorption of nutrients	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.7	Describe & discuss the structure and functions of liver and gall bladder	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY4.8	Describe & discuss gastric function tests, pancreatic exocrine function tests & liver function tests	K	KH	Y	Lecture, Small group discussion, Demonstration Esophageal Manometry & endoscopy	Written/Viva voce			Biochemistry

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PY4.9	Discuss the physiology aspects of: peptic ulcer, gastro-oesophageal reflux disease, vomiting, diarrhoea, constipation, Adynamic ileus, Hirschsprung's disease	K	KH	Y	Lecture, Small group discussion	Written/Viva voce		General Medicine	Biochemistry
PY7.8	Describe & discuss Renal Function Tests	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
PY8.4	Describe function tests: Thyroid gland; Adrenal cortex, Adrenal medulla and pancreas	K	KH	Y	Lecture, Small group discussion	Written/Viva voce			Biochemistry
Pathology									
PA12.2	Describe the pathogenesis of disorders caused by protein calorie malnutrition and starvation	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Pediatrics	
PA14.1	Describe iron metabolism	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PA15.1	Describe the metabolism of Vitamin B12 and the etiology and pathogenesis of B12 deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.1	Define and classify hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.2	Describe the pathogenesis and clinical features and hematologic indices of hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.3	Describe the pathogenesis, features, hematologic indices and peripheral blood picture of sickle cell anemia and thalassemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA16.4	Describe the etiology, pathogenesis, hematologic indices and peripheral blood picture of Acquired hemolytic anemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	
PA25.1	Describe bilirubin metabolism, enumerate the etiology and pathogenesis of jaundice, distinguish between direct and indirect hyperbilirubinemia	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, General Medicine	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
Dermatology, Venereology & Leprosy									
DR17.1	Enumerate and identify the cutaneous findings in Vitamin A deficiency	K/S	SH	Y	Lecture, Small group discussion, Bedside clinic	Skill assessment Viva voce		General Medicine, Pediatrics, Biochemistry	
DR17.2	Enumerate and describe the various skin changes in Vitamin B complex deficiency	K	KH	Y	Lecture	Written/ Viva voce		General Medicine Pediatrics, Biochemistry	
DR17.3	Enumerate and describe the various changes in Vitamin C deficiency	K	KH	Y	Lecture	Written/ Viva voce		General Medicine, Pediatrics, Biochemistry	
DR17.4	Enumerate and describe the various changes in Zinc deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		General Medicine, Pediatrics, Biochemistry	
Ophthalmology									
OP7.1	Describe the surgical anatomy and the metabolism of the lens	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, HumanAnatomy	
General Medicine									
IM2.3	Discuss and describe the lipid cycle and the role of dyslipidemia in the pathogenesis of atherosclerosis	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
IM2.12	Choose and interpret a lipid profile and identify the desirable lipid profile in the clinical context	S	SH	Y	Bed side clinic, DOAP session	Skill assessment		Biochemistry	
IM2.18	Discuss and describe the indications, formulations, doses, side effects and monitoring for drugs used in the management of dyslipidemia	K	KH	Y	Lecture Small group discussion	Written/ Viva voce		Pharmacology, Biochemistry	
IM11.12	Perform & interpret a capillary blood glucose test	S	P	Y	Bed side clinic, DOAP session	Skill assessment	2	Pathology, Biochemistry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
IM11.13	Perform and interpret a urinary ketone estimation with a dipstick	S	P	Y	Bed side clinic, DOAP session	Skill assessment	2	Pathology, Biochemistry	
IM13.1	Describe the clinical epidemiology and inherited & modifiable risk factors for common malignancies in India	K	K	Y	Lecture, Small group discussion	short note/ Viva voce		Pathology, Biochemistry	
IM23.1	Discuss and describe the methods of nutritional assessment in an adult and calculation of caloric requirements during illnesses	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.2	Discuss and describe the causes and consequences of protein caloric malnutrition in the hospital	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.3	Discuss and describe the aetiology, causes, clinical manifestations, complications, diagnosis & management of common vitamin deficiencies	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM23.4	Enumerate the indications for enteral and parenteral nutrition in critically ill patients	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	Pediatrics
IM24.22	Describe and discuss the aetiopathogenesis, clinical presentation, complications, assessment and management of nutritional disorders in the elderly	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
Pediatrics									
PE9.1	Describe the age related nutritional needs of infants, children and adolescents including micronutrients and vitamins	K	KH	Y	Lecture, Small Group discussion	Written/ Viva voce		Community Medicine, Biochemistry	
PE9.3	Explains the Calorific value of common Indian foods	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE10.1	Define Describe the etio-pathogenesis , Classify including WHO classification , clinical features, complication and management of Severe Acute Malnourishment (SAM) and Moderate Acute Malnutrition (MAM)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE10.2	Outline the clinical approach to a child with SAM and MAM	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry	
PE10.3	Assessment of a patient with SAM and MAM, diagnosis, classification and planning management including hospital and community based intervention, rehabilitation and prevention	S	SH	Y	Bed side clinics, Skill Lab	Skill station		Physiology, Biochemistry	
PE11.1	Describe the common etiology, clinical features and management of Obesity in children	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Physiology, Biochemistry, Pathology	
PE12.1	Discuss the (RDA) , dietary sources of Vitamin A and their role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.2	Describe the causes, clinical features, diagnosis and management of Deficiency / excess of Vitamin A	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.3	Identify the clinical features of dietary deficiency / excess of Vitamin A	S	SH	Y	Bed side clinics, Small group discussion	Document in log book		Biochemistry	
PE12.4	Diagnose patients with Vitamin A deficiency, Classify and plan management	S	SH	N	Bed side clinics, Skill Station	Document in log book		Biochemistry	
PE12.5	Discuss the Vitamin A prophylaxis program and their recommendations	K	K	Y	Lecture, Small group Discussion	Written/ Viva voce		Biochemistry	
PE12.6	Discuss the RDA, dietary sources of Vitamin D and their role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.7	Describe the causes, clinical features, diagnosis and management of Deficiency / excess of Vitamin D (Rickets and Hypervitaminosis D)	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.8	Identify the clinical features of dietary deficiency of Vitamin D	S	SH	Y	Bedside clinics, Skills lab	Document in log book		Biochemistry, Physiology, Pathology	
PE12.9	Assess patients with Vitamin D deficiency, Diagnose, Classify and plan management	S	SH	Y	Bed side clinics	Document in log book		Biochemistry, Physiology, Pathology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE12.11	Discuss the RDA, dietary sources of Vitamin E and their role in Health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Pathology Biochemistry	
PE12.12	Describe the causes, clinical features, diagnosis and management of deficiency of Vitamin E	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.13	Discuss the RDA , dietary sources of Vitamin K and their role in Health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.14	Describe the causes, clinical features, diagnosis , management and prevention of Deficiency of Vitamin K	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Physiology, Pathology	
PE12.15	Discuss the RDA , dietary sources of Vitamin B and their role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.16	Describe the causes, clinical features, diagnosis and management of Deficiency of B complex Vitamins	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.17	Identify the clinical features of Vitamin B complex deficiency	S	SH	Y	Bedside clinics, Skills lab	Document in log book		Biochemistry	
PE12.18	Diagnose patients with Vitamin B complex deficiency and plan management	S	SH	Y	Bed side clinics, Skill lab	Document in log book		Biochemistry	
PE12.19	Discuss the RDA, dietary sources of Vitamin C and their role in Health and disease	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.20	Describe the causes, clinical features, diagnosis and management of Deficiency of Vitamin C (scurvy)	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE12.21	Identify the clinical features Vitamin C deficiency	S	SH	N	Bed side clinics, Skill lab	Document in log book		Biochemistry	
PE13.1	Discuss the RDA, dietary sources of Iron and their role in health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Biochemistry	
PE13.2	Describe the causes, diagnosis and management of Fe deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Pathology, Biochemistry	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
PE13.3	Identify the clinical features of dietary deficiency of Iron and make a diagnosis	S	SH	Y	Bed side clinics, Skill Lab	Document in log book		Pathology, Biochemistry	
PE13.4	Interpret hemogram and Iron Panel	S	SH	Y	Bed side clinic, Small group discussion	Skill Assessment		Pathology, Biochemistry	
PE13.7	Discuss the RDA , dietary sources of Iodine and their role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.8	Describe the causes, clinical features, diagnosis and management of Deficiency of Iodine	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.9	Identify the clinical features of Iodine deficiency disorders	S	SH	N	Lecture, Bed side clinic	Written/ Viva voce		Biochemistry	
PE13.10	Discuss the National Goiter control program and their recommendations	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry, Community Medicine	
PE13.11	Discuss the RDA, dietary sources of Calcium and its role in Health and disease	K	K	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.12	Describe the causes, clinical features, diagnosis and management of Ca Deficiency	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.13	Discuss the RDA , dietary sources of Magnesium and their role in Health and disease	K	K	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE13.14	Describe the causes, clinical features, diagnosis and management of Magnesium Deficiency	K	KH	N	Lecture, Small group discussion	Written/ Viva voce		Biochemistry	
PE19.1	Explain the components of the Universal immunization Program and the sub National Immunization Programs	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.2	Explain the epidemiology of Vaccine preventable diseases	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.3	Vaccine description with regards to Classification of vaccines, Strain used, Dose, route, schedule, Risks benefits and side effects,	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	

Number	COMPETENCY The student should be able to	Domain K/S/A/C	Level K/KH/S H/P	Core (Y/N)	Suggested Teaching Learning method	Suggested Assessment method	Number required to certify P	Vertical integration	Horizontal Integration
	indications and contraindications								
PE19.4	Define cold chain and discuss the methods of safe storage and handling of vaccines	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE19.5	Discuss immunization in special situations – HIV positive children, immunodeficiency, preterm, organ transplants, those who received blood and blood products, splenectomised children, Adolescents, travellers	K	KH	Y	Lecture, Small group discussion	Written/ Viva voce		Community Medicine, Microbiology	
PE21.11	Perform and interpret the common analytes in a Urine examination	S	SH	Y	Bed side clinic Labs, Skill lab	Skill assessment		Biochemistry, Pathology	
PE29.16	Discuss the Indications for Hemoglobin electrophoresis and interpret report	K	K	N	Small group discussion	Viva voce		Biochemistry	
PE33.6	Perform and interpret Urine Dip Stick for Sugar	S	P	Y	DOAP session	Skill assessment	3	Biochemistry	
General Surgery									
SU1.1	Describe basic concepts of homeostasis, enumerate the metabolic changes in injury and their mediators.	K	KH	Y	Lecture, Bed side clinic and Small group discussion.	Written/ Viva voce.		Physiology, Biochemistry	
SU1.2	Describe the factors that affect the metabolic response to injury.	K	KH	Y	Lecture, Bed side clinic and Small group discussion.	Written/ Viva voce.		Biochemistry	
SU9.1	Choose appropriate biochemical, microbiological, pathological, imaging investigations and interpret the investigative data in a surgical patient.	K	KH	Y	Lecture, Small group discussion.	Written/ Viva voce		Biochemistry, Microbiology, Pathology	
SU12.3	Discuss the nutritional requirements of surgical patients, the methods of providing nutritional support and their complications.	K	KH	Y	Lecture, Small group discussion, Bedside clinic discussion	Written/ Viva voce		Biochemistry	

11. Assessment

Introduction:

Competency based education has been defined as an outcome-based approach to the design, implementation, assessment and evaluation of a medical education program using an organizing framework of competencies. It mandates greater emphasis on setting up an ongoing and longitudinal assessment. Assessment in competency based curriculum plays a crucial role in its implementation. Competency is not an all or none phenomenon. Rather it is incremental. Thus, it is more about integration of the required knowledge, skills and attitudes rather than anyone of them in isolation. Therefore, assessment in competency based curriculum should incorporate integration to the extent feasible while maintaining subject identity.

Purpose of assessment in competency based curriculum:

While an obvious purpose of assessment in competency based curriculum is to help the teachers decide if the students have acquired the desired competencies, an equally important purpose is to help the students acquire and improve their competencies. Quality assurance also requires quality assessment. Major characteristics of competency based assessment are their longitudinal nature, provision of developmental feedback and authentic settings, all of which result in lowering the stakes on individual assessments. This has other important implications also for assessment design. Since the stakes are low and purpose is to improve learning, high standardization and psychometric rigor is not required. Authenticity of assessment task is more important than its structure or objectivity. Expert subjective judgment plays a major role in assessment of competencies.

Formative & Internal Assessment (IA):

Formative assessment is an assessment conducted during the instruction with the primary purpose of providing feedback for improving learning. It also helps the teachers and learners to modify their teaching learning strategies. The feedback is central to formative assessment and is linked to deep learning, seeking to explore the educational literature and its pedagogical lessons for healthcare educational practice. It provides inputs to both students and teachers regarding adequacy of teaching- learning. In competency based curriculum, IA provides useful avenues for both formative and summative assessment. IA focuses on the content and process of learning i.e. what and how students have learnt throughout the course. This assessment gives priority to

psychomotor, communication and affective domains. These domains are usually not assessed by the traditional assessment methods. It should involve all faculty members of a department (Senior Residents upwards) and not just one or two senior teachers. This helps to build ownership of teaching-learning and assessment as well as provide,, hands-on' experience in assessment to all teachers. IA can be a very useful tool for assessing all competencies in any competency based curriculum. IA should not be considered as an assessment without external controls and can be utilized in a manner to overcome some of its perceived weaknesses. Utility of IA can be further improved by involving all teachers in the department and limiting the contribution of individual teacher, test or tool.

Designing a system of assessment

Miller's pyramid will be followed while designing an internal assessment taking all domains of learning i.e. cognitive, psychomotor and affective should be taken into account and weightage should be assigned to these domains for assessment. [**Knows**- Knowledge tested by written examination; **Knows how**-Application of knowledge tested by clinical problem solving; **Shows how**-Demonstration of clinical skills tested by OSCE, Case presentation, SP; **Dose**- Daily patient care tested by work based assessment.

While assessment will continue to be subject based, efforts must be made to ensure that phase appropriate correlates are assessed to determine if the learner has internalised and integrated the concept and its application.

Internal Assessment

Table 27. Scheduling of internal assessment

Phase	Number of tests and Subjects	Remarks
1 st	<p><u>Three tests</u></p> <ul style="list-style-type: none">• Human Anatomy• Physiology• Biochemistry <p><u>One test</u></p> <ul style="list-style-type: none">• Community Medicine	<ul style="list-style-type: none">• ECE assessment should be included subject wise• ATCOM ia assessed separately for separately for calculating IA Marks. They are not assesses in summative exam.• Three Term assessments and one model exams are conducted in first year. In addition to there assessments module test at the end of each system is also conducted and taken for calculating IA Marks.

Formative assessment

Assessment of Foundation Course should be included in formative assessment of first phase. Assessment of ECE should be included in formative as well as in internal assessment in first phase subject wise.

Components of IA

- Theory IA can include: Written tests, should have essay questions, short notes and creative writing experiences.
- Practical / Clinical IA can include: practical / clinical tests, Objective Structured Clinical Examination (OSCE) / Objective Structured Practical Examination (OSPE), Directly Observed Procedural Skills (DOPS), Mini Clinical Evaluation Exercise (mini-CEX), records maintenance and attitudinal assessment.
- Assessment of Log-book. Log book should record all activities like seminar, symposia, quizzes and other academic activities. Achievement of certifiable competencies should also be recorded in logbooks. It should be assessed regularly and submitted to the department. Up To twenty percent IA marks (Theory and Practical) should be from Log book assessment.

Internal

- Assessment for Professional development programme (AETCOM) will include:
 - Written tests comprising of short notes and creative writing experiences in each subject.

- b. OSCE based clinical scenarios and/or viva voce. Skill competencies acquired during the Professional Development Programme must be tested during the clinical, practical and viva voce in every subject.
- (v) Early Clinical Exposure should be part of internal assessment for the respective subject. During assessment, questions should test clinical correlation in basic sciences. Assessment of ECE should be included in formative as well as in internal assessment in first phase subject wise. A log book must be used to record these components.

Feedback should be provided to students throughout the course so that they are aware of their performance and remedial action can be initiated well in time. The feedbacks need to be structured and the faculty and students must be sensitized to giving and receiving feedback.

The results of IA should be displayed on notice board within two weeks of the test and an opportunity provided to the students to discuss the results and get feedback on making their performance better.

Internal assessment marks will not be added to University examination marks and will reflect as a separate head of passing at the summative examination.

Summative assessment

Eligibility to appear for Professional examinations

- a) Attendance: Attendance requirements are 75% in theory and 80% in practical /clinical for eligibility to appear for the examinations in that subject.
- (b) Internal Assessment: Learners must secure at least 50% marks of the total marks (combined in theory and practical; not less than 40 % marks in theory and practical separately) assigned for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.
- (c) Certifiable competencies: Must have completed the required certifiable competencies for that phase of training and completed the log book appropriate for that phase of training to be eligible for appearing at the final university examination of that subject.

University Examinations

Schedule

1. The first Professional examination shall be held at the end of first Professional training (1+12 months), in the subjects of Human Anatomy, Physiology and Biochemistry.
2. A maximum number of four permissible attempts would be available to clear the first Professional University examination, whereby the first Professional course will have to be cleared within 4 years of admission to the said course. Partial attendance at any University examination shall be counted as an availed attempt.

Table 28. Schedule of University Examination

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
							Foundation Course	I MBBS			
I MBBS								Exam I MBBS	II MBBS		
II MBBS								Exam II MBBS	III MBBS		
III MBBS Part I									Exam III MBBS Part I	Electives & Skills	
III MBBS Part II											
Exam III MBBS Part II		Internship									
Internship											

Mark distribution

Summative assessment consists of University examinations. Each theory paper will have 100 marks. Marks distribution as per proposed GMER 2019 for various subjects in given in Table.28

Table 29. Marks distribution for Preclinical subjects in University examinations

Course	Written- Theory – Total	Practicals / Orals/ Clinicals
Human Anatomy - 2 papers	200	100
Physiology - 2 papers	200	100
Biochemistry - 2 papers.	200	100
Pass Criteria <u>Internal Assessment:</u> 50% combined in theory and practical (not less than 40% in each) for eligibility for appearing for University Examinations <u>University Examination:</u> Mandatory 50% marks in theory and practical (practical = practical/ clinical + viva) [theory=theory paper(s) only] Internal assessment marks are not to be added to marks of the University examinations and should be shown separately in the grade card.		

Practical/Clinical examination

Pre-clinical departments should make practical exercises application oriented. Objective Structured Practical Examination (OSPE), One- Minute Preceptor (OMP), Directly Observed Procedural Skills (DOPS) etc. can be suitably modified for this purpose. Practical tests should not become simply tests of knowledge.

12. Blue Print

Internal Assessment

Table 30. Components and Weightage for Internal Assessment

Sections	Component of sections	Weightage
Theory	Test marks	40%
	ECE	10%
	SDL	10%
Practical	Test marks	20%
	Records	10%
	AETCOM	10%

Summative Assessment

- Scheme of practical examination

Table 31. Anatomy

Sessions	Components	Description of Components	Marks
Practical (80 marks)	Gross Anatomy (45 marks)	Gross spotters	2X 15 = 30
		Gross discussion (Paper I & Paper II)	2X 5 = 10
		1 OSPE	1X5=5
	Histology (35 marks)	Histology spotters	2X 10 =20
		Histology slide discussion (General & Systemic)	2X 5 =10
		1 Genetic chart	1X 5 =5
Viva (20 marks)	4 stations (osteology, embryology, radiology & surface marking)		4 X 5 = 20
Total			100

Table 32. Physiology

Sessions	Components	Description of Components	Marks
Practical (80 marks)	*Hematology practical + Calculation (20 marks)	1 Major experiment	1X 10 = 10
		1 Minor experiment	1X 5 = 5
		1 Calculation	1X5 = 5
	System examination (20 marks)	1 case on a part of CVS / Abdomen examination	1X 5 = 5
		1 case on a part of RS examination	1X 5 = 5
		2 cases on a part CNS examination	2X 5 = 10
	**Human experiments + charts (20 marks)	1 Human experiment	1X 15 = 15
		1 Question based on a chart on clinical conditions	1X 5 = 5
OSPE (20 marks)	4 station (1 procedural+ 3 question) General examination/pulse/part of system examination, Interpretation of ECG, Spirometry, Amphibian graphs	4 X 5= 20	
Viva (20 marks)	Interpretation of the clinical finding(s) of cases covered in ECE. (2 systems/examiner)	4 X 5 = 20	
Total			100

Table 33. Components of Hematology and Human Experiment

*Hematology	major experiments	Determination of RBC/ WBC/ Differential Leukocyte count
	minor experiments	Estimation of Hb %, BT, CT and Blood grouping
	calculation	Blood indices & Body fluids, Renal physiology
**Human experiments		Recording of BP – effect of exercise & posture, Vitalography, Ergography- effect of load, frequency, arterial occlusion, venous occlusion & fatigue, Perimetry

Table 34. Biochemistry

Sessions	Components	Description of Components	Marks	
Practical	Quantitative	Estimation of Glucose/Urea/Creatinine/Protein (One of these)	1X20=20 marks	
	* OSPE	15 stations	15X4=60 marks	
		Observed performance -2 stations		8
		Unobserved performance – 2 stations		8
		Response – 10 stations		40
		Attitude – 1 station		4
Viva	Viva/oral examination should assess approach to patient management, emergencies, attitudinal, ethical and professional values. Candidate's skill in interpretation of common investigation data is to be assessed. Based on this, questions from all theory topics can be asked but mainly focused on the below mentioned aspects.		20	

Table 35. List of OSPE station

Sl. No	*Name of the OSPE station
1	Observed performance- CHO
2	Lab report interpretation – lipid profile, OGTT, CSF
3	Vitamins& Mineral – (Case and report interpretation)
4	Organ Function Test (Case and report interpretation)
5	Unobserved performance –Protein
6	Hemoglobin- (Case and report interpretation)
7	Observed performance – Abnormal/normal urine
8	Electrophoresis / Chromatography
9	Acid Base balance(Case and report interpretation)
10	Nutrition
11	Unobserved performance CHO/protein
12	Organ Function Test (Case and report interpretation)

13	Pre-analytical error
14	Instruments
15	Attitude- OGTT/24 hrs urine collection/ECE/PDE

Table 36. Scheme of Theory examination (Anatomy, Physiology, Biochemistry)

Theory examination (200 marks)	Paper I	Section A	20 MCQs each for 1 mark	$20 \times 1 = 20$
		Section B	1 structured essay (SE) of 10 marks	$1 \times 10 = 10$
			6 short answer questions of 5 marks each	$6 \times 5 = 30$
		Section C	1 structured essay (SE) of 10 marks	$1 \times 10 = 10$
			6 short answer questions of 5 marks each	$6 \times 5 = 30$
		Totals		
	Paper II	Section A	20 MCQs each for 1 mark	$20 \times 1 = 20$
		Section B	1 structured essay (SE) of 10 marks	$1 \times 10 = 10$
			6 short answer questions of 5 marks each	$6 \times 5 = 30$
		Section C	1 structured essay (SE) of 10 marks	$1 \times 10 = 10$
			6 short answer questions of 5 marks each	$6 \times 5 = 30$
		Total		

Instruction for paper setters

1. Follow MCI competencies for paper setting in the subject.
2. Designing of question paper should take into consideration all levels of knowledge domain e.g. Bloom's taxonomy of cognitive domain. Use appropriate verbs for the questions at each level to assess higher levels of learning. Use combination of various types of questions e.g. structured essays (Problem based Long Answer Questions - LAQ), Clinical vignette based Short Answers Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions- MCQ). Marks for each part should be indicated separately. MCQs if used should not have more than 20% weightage.
3. The question paper setter must sample the contents appropriately from competencies. The blueprinting grid can help the paper setters to balance the

question papers in content related aspects as depicted below in Table 5. Blueprinting will add to the value and quality of these assessments. Moderation of theory question paper by subject expert must be arranged by Universities.

- Examinations should include elements from ECE to test the ability of the student to apply basic science knowledge in clinical context.

Table 37. Bloom’s Taxonomy: Knowledge Domain Action verbs

Level	Suggested Verbs
Knowledge	Define, Describe, Draw, Find, Enumerate, Cite, Name, Identify, List, label, Match, Sequence, Write, State
Comprehension	Discuss, Conclude, Articulate, Associate, Estimate, Rearrange, Demonstrate understanding, Explain, Generalise, Identify, Illustrate, Interpret, Review, Summarise
Application	Apply, Choose, Compute, Modify, Solve, Prepare, Produce, Select, Show, Transfer, Use
Analysis	Analyse, Characterise, Classify, Compare, Contrast, Debate, Diagram, Differentiate, Distinguish, Relate, Categorise
Synthesis	Compose, Construct, Create, Verify, Determine, Design, Develop, Integrate, Organise, Plan, Produce, Propose, rewrite
Evaluation	Appraise, Assess, Conclude, Critic, Decide, Evaluate, judge, Justify, Predict, Prioritise, Prove, Rank

Table 38: Proposed Blueprinting in knowledge domain

Level	Total
Knowledge	5 (20%)
Comprehension	5(20%)
Application	5 (20%)
Analysis	6(24%)
Synthesis	2 (8%)
Evaluation	2 (8%)
Total	25 (100%)

13. Blue Print for Question Paper and Model Question Paper

13.1 Anatomy

Blueprint Of Theory Paper II

Type of question	Knowledge domain tested	Weightage
Understanding (U)	Comprehension & analysis	70 marks
Applied (A)	Application	20 marks
Recall (R)	Knowledge	10 marks
Total		100 marks

Blueprint for Theory Paper taken from Upper Limb / Lower Limb and Abdomen / Pelvis

Blueprint for MCQs – Paper I

Section A (MCQ)

MCQ No	System	MCQ No	System
1-2	Upper limb	11-12	Abdomen
3-4	Lower limb	13-14	Pelvis
5-6	General Embryology	15-16	Perineum
7-8	General Anatomy	17-20	Related Histology and embryology of Abdomen/Pelvis/Perineum
9-10	General Histology		

PAPER I- BLUE PRINT FOR SECTION B & C

BLUE PRINT FOR LAQ TAKEN FROM UPPER LIMB/LOWER LIMB AND ABDOMEN/PELVIS

	Marks Distribution Domain			Question type	Total Marks	MCQ Domain U/A/R	Grand Total
	Understanding	Applied	Recall				
Upper limb/lower limb	8	2		1 LAQ	10	1:U 1:A	12
Upper limb/lower limb	5	5	5	3 SAQ	15	1:U 1:A	17
General histology	5			SAQ	5	2:U	7
General embryology	5			SAQ	5	2:U	7
General Anatomy	5			1 SAQ	5	2:U	7
Abdomen/ pelvis and perineum	8	2		1 LAQ	10	2:U 2:A 2: R	16
Abdomen/ pelvis and perineum	5+5	5	5	4 SAQ	15		15
Related histology from abdomen/pelvis	5			1 SAQ	5	2:U	7
Related embryology from abdomen/ pelvis	5			1SAQ	5	2:U	7
	56+14(MCQ)= 70	14+ 6 (MCQ)= 20	5+5=10		80	20	100

SYLLABUS

Head & neck, Central nervous system, Thorax, Related histology and Embryology from Head and Neck, Central nervous system and Thorax, Genetics

SECTION-A: MCQ'S from all systems

SECTION-B: Includes following systems- Thorax, central nervous system , related histology and embryology from central nervous system and thorax

SECTION C- Includes following systems -Head and neck region, related histology and Embryology from head and neck region, Genetics.

Blueprint For MCQ Taken From Thorax And Head/Neck Region.

Blueprint For MCQs – Paper II

Section A

MCQ No	System	MCQ No	System
1-2	Central nervous system	13-14	Neck
3-6	Thorax	15-16	Related histology from Head & Neck
7-8	Related histology from Thorax/CNS	17-18	Related Embryology from Head & Neck
9-10	Related Embryology from Thorax/CNS	19-20	Genetics
11-12	Head		

PAPER II- BLUE PRINT FOR SECTION B & C

BLUE PRINT FOR LAQ TAKEN FROM THORAX AND HEAD/NECK REGION

	MARKS DISTRIBUTION			Question type	TOTAL MARKS	MCQ Domain U/A/R	GRAND TOTAL
	Domain						
	Understanding	Applied	Recall				
Central nervous system	5		5	2 SAQ	10	2:A	12
Thorax	8 5	2 5		1 LAQ 2 SAQ	20	2:U 2:A	24
Related histology from Thorax/CNS	5			1 SAQ	5	2:U	7
Related embryology from thorax/CNS	5			1 SAQ	5	2:U	7
Head /neck region	8 5	2 5	5	1 LAQ 3 SAQ	10 15	2:U 2:A	29
Related histology from Head / neck region	5			1 SAQ	5	2:U	7
Related embryology from Head/neck region	5			1 SAQ	5	2:U	7
Genetics	5			1SAQ	5	2:U	7
TOTAL	56+14 (MCQ) =70	14+6 (MCQ)=20	5+5(MCQ) =10		80	20	100

SRI BALAJI VIDYAPEETH
DEPARTMENT OF ANATOMY
(Blue Print – 1) MODEL QUESTION PAPER – I

Duration: 3 hours

Max. Mark: 100

Direction:

- *Section A is to be attempted in special shading sheet. No negative marking for wrong answers.*
 - *Write section B & section C in separate sheets*
 - *All question need to be answered*
 - *Answers specific to the questions asked. Draw schematic diagram wherever necessary.*
-

Section A:

MCQ's:

20X1=20 marks

Section B

LAQ:

10X1=10 marks

- 1) Explain the mammary gland under the following headings
 - a) Location & extent (2)
 - b) Gross features (3)
 - c) Blood supply (2)
 - d) Lymphatic drainage with applied anatomy (3)

SAQ:

6X5=30 marks

- 2) Explain the locking and unlocking mechanism of knee joint?
- 3) Apply the anatomy of superficial venous drainage of lower limb in varicose veins?
- 4) What are the boundaries and contents of cubital fossa?
- 5) Describe the parts and write the functions of human placenta?
- 6) Compare the stratified epithelium with pseudostratified epithelium.
- 7) Explain the characteristic features of synovial joint. Write the classification of synovial joint with one example each

Section C

LAQ:

10X1=10 marks

- 1) Explain the stomach under the following headings with suitable diagrams
 - a) Location & external features (2)
 - b) Parts & internal features (2)
 - c) Blood supply (2)
 - d) Lymphatic drainage (2)

e) Any 2 applied anatomy (2)

SAQ:

6X5=30 marks

- 2) What are the supports of uterus
- 3) Classify the inguinal hernia
- 4) Explain the various position of appendix, blood supply and clinical importance of appendix
- 5) Compare the structures felt by per-rectal examination in males & females
- 6) Explain the formation and fate of vitellointestinal duct. Add a note on congenital anomalies
- 7) Describe the microscopic features of urinary bladder

SRI BALAJI VIDYAPEETH
DEPARTMENT OF ANATOMY
MODEL QUESTION PAPER – II

Duration: 3 hours

Max. Mark: 100

Direction:

- *Section A is to be attempted in special shading sheet. No negative marking for wrong answers.*
 - *Write section B & section C in separate sheets*
 - *All question need to be answered*
 - *Answers specific to the questions asked. Draw schematic diagram wherever necessary.*
-

Section A:

MCQs:

20X1=20 marks

Section B

Long Answer Questions:

10X1=10 marks

- 1) Explain knee joint under the following headings with suitable diagrams
 - a) Type of joint & articulating ends (2)
 - b) Ligaments (2)
 - c) Blood supply (2)
 - d) Locking and unlocking mechanism(2)
 - e) Applied anatomy (2)

Short Answer Questions:

6X5=30 marks

- 2) Explain the course and branches of brachial artery with clinical significance
- 3) What are boundaries and contents of femoral triangle
- 4) Describe the formation of neural tube and list the derivatives of neural crest cells
- 5) Apply anatomical knowledge of brachial plexus in Erb's & Klumpke's paralysis
- 6) Explain the different types of anastomoses with examples
- 7) Describe the microscopic features of lymph node

Section C

Long Answer Questions:

10X1=10 marks

- 8) Explain testes under the following headings with suitable diagrams
 - a) Coverings (2)
 - b) Presenting parts & relations (2)
 - c) Blood supply (2)

- d) Descent of testes (2)
- e) Hydrocele (2)

Short Answer Questions:

6X5=30 marks

- 9) Explain the formation and tributaries of portal vein. State any four sites of portocaval anastomosis with clinical significance
- 10) Describe the microscopic features of pancreas.
- 11) Classify the derivatives of mesonephric duct in male and female
- 12) State the coverings and relations of right kidney
- 13) Explain the boundaries and sub division of lesser sac
- 14) Classify the branches of internal iliac artery

SRI BALAJI VIDYAPEETH
DEPARTMENT OF ANATOMY
(Blue Print – 2)
MODEL QUESTION PAPER – II

Duration: 3 hours

Max. Mark: 100

Direction:

- *Section A is to be attempted in special shading sheet. No negative marking for wrong answers.*
 - *Write section B & section C in separate sheets*
 - *All question need to be answered*
 - *Answers specific to the questions asked. Draw schematic diagram wherever necessary.*
-

Section A

MCQ's:

20X1=20 marks

Section B

Long Answer Questions:

10X1=10 marks

- 1) Describe Right lung under following headings:
 - a) Presenting parts (2)
 - b) Mediastinal impression (3)
 - c) Bronchopulmonary segments (3)
 - d) Applied anatomy (2)

Short Answer Questions:

6X5=30 marks

- 2) Discuss the course and tributaries of coronary sinus.
- 3) Draw a labeled diagram of mid brain at the level of superior colliculus.
- 4) State the parts, connections and functions of corpus callosum.
- 5) Discuss the course, tributaries and termination of thoracic duct.
- 6) Draw a neat labeled diagram of histology of cerebellum
- 7) Discuss the development of interatrial septum. Add a note on congenital anomalies

Section C

Long Answer Questions:

10X1=10 marks

- 8) Discuss the parotid gland under the following headings
 - a) Coverings (2)
 - b) parts and relations (2)
 - c) Nerve supply (4)

d) Applied anatomy (2)

Short Answer Questions:

6x5=30 marks

- 9) Discuss the interior of laryngeal cavity with blood supply and nerve supply
- 10) Enumerate the Derivatives of second pharyngeal arch
- 11) Draw a neat labeled diagram of histology of thyroid gland.
- 12) State the attachment, nerve supply and action of Sternocleidomastoid muscle.
- 13) Discuss the layers of scalp. Add a note on black eye.
- 14) State the clinical features and chromosomal abnormalities of Down's syndrome.

SRI BALAJI VIDYAPEETH
MODEL QUESTION PAPER – II

Duration: 3 hours

Max. Mark: 100

Direction:

- *Section A is to be attempted in special shading sheet. No negative marking for wrong answers.*
 - *Write section B & section C in separate sheets*
 - *All question need to be answered*
 - *Answers specific to the questions asked. Draw schematic diagram wherever necessary.*
-

Section A (20 Marks)

MCQ's:

20X1=20 marks

Section B (40 Marks)

Long Answer Questions:

10X1=10 marks

- 1) Discuss heart under following headings 4+4+2=10
 - a) Arterial supply
 - b) Venous drainage
 - c) Applied anatomy.

Short Answer Questions

6x5=30 marks

- 2) State the boundaries of superior mediastinum. Enumerate its contents.
- 3) Discuss the sulci, gyri on superolateral surface of brain.
- 4) Discuss the course of a typical intercostal nerve.
- 5) Draw a neat labelled diagram of circle of willis. Add a note on its clinical significance.
- 6) Draw a neat labeled diagram of histology of lung.
- 7) Discuss the development of interventricular septum. Add a note on congenital anomalies.

Section C(40 Marks)

Long Answer Questions:

10X1=10 marks

- 8) Discuss thyroid gland under the following headings- 2+4+2+2=10
 - a) Coverings (2)
 - b) Parts and relations (4)
 - c) Blood supply (2)
 - d) Applied anatomy (2)

Short Answer Questions:

6x5=30 marks

- 9) State the formation, termination, tributaries and applied aspect of external jugular vein.
- 10) Enumerate the tributaries and communications of cavernous sinus.
- 11) Draw a neat labeled diagram of histology of pituitary gland.
- 12) Discuss the development of palate. Add a note on congenital anomalies.
- 13) Discuss Barr body. State its clinical significance.
- 14) Discuss the parts , relations and blood supply of palatine tonsil

13.2 Physiology

Scheme for Theory BLUEPRINT OF PAPER I

Type of question	Knowledge domain tested	Weightage
Understanding (U)	Comprehension & analysis	70 marks
Applied (A)	Application	20 marks
Recall (R)	Knowledge	10 marks
Total		100 marks

System	Marks distribution	Question Type	Total marks
General Physiology	U: 5	SAQ	5
Blood (SE)*	U: 10, A: 5	LAQ and SAQ	15
Nerve Muscle	U: 10	SAQ	10
Renal physiology	U: 5, R:5	SAQ	10
GIT	U: 10, A: 5	SAQ	15
Endocrine (SE)*	U: 10, A: 5	LAQ and SAQ	15
Reproduction	U: 10	SAQ	10
MCQs	U: 10, A: 5, R:5		20
Total			100

* One structured essay (SE) from **Blood** in section B & another from **Endocrine** in section C.

BLUEPRINT FOR MCQS – Paper I

Section A

MCQ No	System
1 -3	General Physiology
4 -6	Blood
7-8	Nerve muscle
9-10	GIT
12-13	Renal
14-18	Endocrine
19-20	Reproduction

PAPER I- BLUE PRINT FOR SECTION B & C

Questions	Q. No	System wise Blueprint	Type of Questions	Mark Distribution
Section A				
MCQ (20)	1 - 20	As mentioned above	U: 10, A: 5, R:5	20
Section B				
LAQ 1X10	1	Blood	Understand +Applied	10
SAQ 6X5=30	2	General Physiology	Understand	5
	3	Blood	Understand	5
	4	Nerve Muscle	Understand	5
	5	Nerve Muscle	Understand	5
	6	Renal	Understand	5
	7	Renal	Recall	5
Section C				
LAQ 1X10	8	Endocrine	Understand + Applied	10
SAQ	9	Endocrine	Understand	5
	10	Reproduction	Understand	5
	11.	Reproduction	Understand	5
	12	GIT	Understand	5

6X5=30	13	GIT	Understand	5
	14	GIT	Applied	5
Total				100

BLUEPRINT OF PAPER II

Type of question	Knowledge domain tested	Weightage
Understanding (U)	Comprehension & analysis	70 marks
Applied (A)	Application	20 marks
Recall (R)	Knowledge	10 marks
Total		100 marks

System	Marks distribution	Question Type	Total marks
CVS (SE)*	U: 15, A: 5	LAQ and SAQ	20
RS (SE)*	U: 10, A: 5	LAQ and SAQ	15
CNS (SE)*	U: 15, A: 5, R: 5	LAQ and SAQ	25
Special senses	U: 10	SAQ	10
Integrated Physiology	U: 10	SAQ	10
MCQs	U:10, A: 5, R: 5		20
Total			100

Structured essay (SE) from either CVS & RS in sect-B & sec – C respectively, or from RS and CNS in sect-B & sec – C respectively or from CVS & CNS in sect-B & sec – C respectively.

BLUEPRINT FOR MCQS – Paper II

Section A

MCQ No	System
1-6	Cardiovascular system
7-10	Respiratory system
11-17	Central nerves system
18	Special senses
19-20	Integrated physiology

PAPER II- BLUE PRINT FOR SECTION B & C

(Model Blueprint 1: LAQ from CVS and RS)

Questions	Q.No	System wise Blueprint -1	Type of Questions	Mark Distribution
Section A				
MCQs (20)	1 - 20	As mentioned above	U:10, A: 5, R: 5	20
Section B				
LAQ 1X10	1	Cardio Vascular System	Understand +Applied	10
SAQ 6X5=30	2	Cardio Vascular System	Understand	5
	3	Cardiovascular system	Applied	5
	4	Special senses	Understand	5
	5	Special senses	Understand	5
	6	Integrated physiology	Understand	5
	7	Integrated physiology	Understand	5
Section C				
LAQ 1X10	8	Respiratory	Understand + Applied	10
SAQ	9	Respiratory	Understand	5
6X5=30	10	Central nervous system	Understand	5

	11	Central nervous system	Understand	5
	12	Central nervous system	Understand	5
	13	Central nervous system	Applied	5
	14	Central nervous system	Recall	5
Total				100

PAPER II - BLUE PRINT FOR SECTION B & C
(Model Blueprint 2: LAQ from RS and CNS)

Questions	Q.no	System wise Blueprint -2	Type of questions	Mark distribution
Section A				
MCQs (20)	1 - 20	As mentioned above	U:10, A: 5, R: 5	20
Section B				
LAQ 1X10	1	Respiratory	Understand + Applied	10
SAQ 6X5=30	2	Respiratory	Understand	5
	3	Cardiovascular system	Recall	5
	4	Cardiovascular system	Understand	5
	5	Cardiovascular system	Understand	5
	6	Cardiovascular system	Understand	5
	7.	Integrated physiology	Understand	5
Section C				
LAQ 1X10	8.	Central nervous system	Understand + Applied	10
SAQ 6X5=30	9.	Central nervous system	Understand	5
	10.	Central nervous system	Understand	5
	11.	Central nervous system	Understand	5
	12.	Special senses	Understand	5
	13.	Special senses	Applied	5
	14.	Integrated physiology	Understand	5
Total				100

PAPER II- BLUE PRINT FOR SECTION B & C

(Model Blueprint 3: LAQ from CVS and CNS)

Questions	Q.No	System wise Blueprint -3	Type of Questions	Mark Distribution
Section A				
MCQs (20)	1 - 20	As mentioned above	U:10, A: 5, R: 5	20
Section B				
LAQ 1X10	1	Cardiovascular system	Understand + Applied	10
SAQ 6X5=30	2	Cardiovascular system	Understand	5
	3	Cardiovascular system	Recall	5
	4	Respiratory system	Understand	5
	5	Respiratory system	Understand	5
	6	Respiratory system	Understand	5
	7.	Integrated physiology	Understand	5
Section C				
LAQ 1X10	8.	Central nervous system	Understand + Applied	10
SAQ 6X5=30	9.	Central nervous system	Understand	5
	10.	Central nervous system	Understand	5
	11.	Central nervous system	Understand	5
	12.	Special senses	Understand	5
	13.	Special senses	Applied	5
	14.	Integrated physiology	Understand	5
Total				100

SRI BALAJI VIDYAPEETH
DEPARTMENT OF PHYSIOLOGY
(Blue Print – 1) MODEL QUESTION PAPER – I

Duration: 3 hours

Max. Mark: 100

Direction:

- Section A is to be attempted in special shading sheet. No negative marking for wrong answers.
- Write section B & section C in separate sheets
- All questions need to be answered
- Answers specific to the questions asked. Draw schematic diagram wherever necessary.

MCQ	Section A (20 marks)	1X20=20
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Section B (40 marks)

Long Answer Question		1X10=10
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1. Define hemostasis. List the stages of haemostasis. Briefly explain the intrinsic & extrinsic pathways of haemostasis. Write the types and cause of hemophilia. (1+2+5+2)

Short Answers Questions		6X5=30
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2. Briefly explain positive and negative feedback mechanisms with one example each.
3. Name any 4 plasma proteins. List their functions.
4. Briefly explain the ionic basis of action potential with a schematic diagram.
5. Write the cause of myasthenia gravis. Briefly explain the rationale of plasmapheresis and using pyridostigmine in myasthenia gravis.
6. Briefly explain micturition reflex with a schematic diagram
7. Briefly explain the factors affecting glomerular filtration rate.

Section C (40 marks)

Long Answer		1X10=10
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8. Explain the role of parathormone, vitamin D3 and calcitonin in maintaining calcium homeostasis. Write the cause and clinical features in tetany.

Short Answers		6X5=30
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9. Briefly explain the hypothalamo-hypophyseal connection
10. Describe the stages of spermatogenesis. Mention the factors influencing spermatogenesis.
11. Briefly explain the phases of uterine cycle.
12. List the composition of saliva and mention their functions. Briefly explain how salivary secretion is regulated.
13. Briefly explain the functions of Gastrin.
14. Briefly explain the pathophysiology and management of Peptic ulcer.

SRI BALAJI VIDYAPEETH
DEPARTMENT OF PHYSIOLOGY
MODEL QUESTION PAPER – II

Duration: 3 hours

Max. Mark: 100

Direction:

- Section A is to be attempted in special shading sheet. No negative marking for wrong answers.
- Write section B & section C in separate sheets
- All question need to be answered
- Answers specific to the questions asked. Draw schematic diagram wherever necessary.

Section A (20 marks)

MCQ

1X20=20

Section B (40 marks)

Long Answer Question

1X10=10

1. Define shock. Mention its types. Briefly explain the compensatory mechanism and management of circulatory shock. (2+2+6)

Short Answers Questions

6X5=30

2. Briefly explain Fick's principle in relation to measurement of cardiac output.
3. Briefly explain pacemaker potential and ventricular action potential with a schematic diagram.
4. Briefly explain the functions of middle ear.
5. Draw visual pathway. Briefly explain the visual field defect in lesion of visual pathway at the level of optic chiasma.
6. Briefly explain the role of hypothalamus in temperature regulation.
7. Briefly explain the pathophysiology in decompression sickness

Section C (40 marks)

Long Answer Question

1X10=10

8. Name the neural centers for regulation of respiration. Briefly explain the neural regulation of respiration. Mention what happens to breathing in bulbar poliomyelitis.

Short Answers Questions

6X5=30

9. Explain the respiratory and non-respiratory functions of lungs.
10. Write the differences between lower motor neuron lesion and upper motor neuron lesion.
11. Draw and explain pain pathways.
12. Define reflex. Draw a reflex arc with an example.
13. Briefly explain the effect of lesion seen in Brown Sequard syndrome.
14. Briefly explain and three functions of hypothalamus

SRI BALAJI VIDYAPEETH
DEPARTMENT OF PHYSIOLOGY
MODEL QUESTION PAPER – II

Duration: 3 hours

Max. Mark: 100

Direction:

- *Section A is to be attempted in special shading sheet. No negative marking for wrong answers.*
- *Write section B & section C in separate sheets*
- *All question need to be answered*
- *Answers specific to the questions asked. Draw schematic diagram wherever necessary.*

Section A (20 marks)

MCQ **1X20=20**

Section B (40 marks)

Long Answer Question **1X10=10**

1. Briefly explain chemical regulation of respiration. Add a note on respiratory changes in respiratory acidosis and alkalosis (6+4)

Short Answers Questions **6X5=30**

2. Draw normal spirogram indicating lung volumes and capacities.
3. Briefly explain the homometric regulation of cardiac output.
4. Enumerate the properties of cardiac muscle fibers
5. Define blood pressure. Mention the factors determining it.
6. Draw normal lead II ECG. Mention the cause of i) p wave ii) QRS complex segment.
7. Define hypoxia? Classify it. Briefly explain cause, characteristic feature and treatment of any one type.

Section C (40 marks)

Long Answer Questions **1X10=10**

8. Describe the connections and functions of cerebellum. List the signs and symptoms of cerebellar disease.

Short Answers **6X5=30**

9. What is normal CSF volume and pressure? Mention its functions.
10. Briefly describe any three properties of synapse
11. Briefly describe any three functions of hypothalamus
12. Draw auditory pathway. Mention the functions of middle ear.
13. Name the errors of refraction. Mention what lens is used for each type.
14. Briefly explain the changes occurring during acclimatization to high altitude.

SRI BALAJI VIDYAPEETH
DEPARTMENT OF PHYSIOLOGY
(Blue Print – 2) MODEL QUESTION PAPER – I

Duration: 3 hours

Max. Mark: 100

Direction:

- *Section A is to be attempted in special shading sheet. No negative marking for wrong answers.*
 - *Write section B & section C in separate sheets*
 - *All question need to be answered*
 - *Answers specific to the questions asked. Draw schematic diagram wherever necessary.*
-

Section A (20 marks)

MCQ **1X20=20**

Section B (40 marks)

Long Answer Question **1X10=10**

1. List the sequential events of cardiac cycle. Briefly explain the left ventricular pressure – volume changes with a schematic diagram. Mention what happens to these events in arrhythmia.

Short Answers Question **6X5=30**

2. Draw lead II ECG. Mention the cause for each wave in ECG.
3. Briefly explain the cause and significance of windkesell effect.
4. Briefly explain the changes in intrapleural & intra-alveolar pressure during inspiration and expiration.
5. Briefly explain oxygen dissociation curve with a diagram. Mention two causes each for right and left shift.
6. Define lung compliance. Write its normal value. Briefly explain the effect of fibrosis of lung on compliance
7. Briefly explain the respiratory changes during dynamic muscular exercise.

Section C (40 marks)

Long Answer **1X10=10**

8. Draw and explain pyramidal tract. Describe the clinical features seen in right internal capsule lesion

Short Answers **6X5=30**

9. Differentiate between EPSP from IPSP.
10. Briefly explain stretch reflex with a diagram

11. Mention the functions of the reticular formation.
12. Briefly explain the structure and function of organ of Corti with a diagram.
13. Draw pathway of olfaction. What is Kallman's syndrome?
14. Mention the cause and briefly explain the physiological effect in decompression sickness.

13.3 Biochemistry

Section A (MCQ)

PAPER – I	MCQ
Cell, subcellular organelles and fluid and electrolyte balance	2
Amino acid chemistry and metabolism, Plasma proteins, Extra cellular matrix	5
Hemoglobin chemistry and metabolism	2
Enzymology	2
Immunology	2
Carbohydrate chemistry and metabolism	5
Biological oxidation, Electron transport chain, Integration of metabolism	2
TOTAL	20

PAPER - 1 BLUEPRINT – I

QUESTIONS	Q.No	SYSTEM WISE Blueprint – I	TYPE OF QUESTIONS	DISTRIBUTION OF MARKS
Section B (Cell, subcellular organelles and fluid and electrolyte balance Amino acid chemistry and metabolism, Plasma proteins, Extra cellular matrix, Hemoglobin chemistry and metabolism)				
I.LAQ 1X10	1	Amino acid metabolism	Understanding +Applied	6+4
II.SAQ 6X5=30	2	Aminoacid chemistry & metabolism	Understanding+ recall	3+2
	3	Aminoacid chemistry & metabolism	Understanding +Applied	3+2
	4	Cell and subcellular organelles	Understanding	5
	5	Cell and subcellular organelles	Understanding +Applied	3+2
	6	Hemoglobin chemistry and metabolism	Understanding +Applied	3+2
	7	Hemoglobin chemistry and metabolism	Understanding +Applied	3+2

Section C (Enzymology, Immunology, Carbohydrate chemistry and metabolism, Biological oxidation, Electron transport chain, Integration of metabolism)				
I.LAQ 1X10	8	Enzymology	Understanding +Applied	8+2
II.SAQ 6X5=30	9	Immunology	Understanding	5
	11	Biological oxidation, Electron transport chain, Integration of metabolism	Understanding +Recall	3+2
	12	Carbohydrate chemistry and metabolism	Understanding +Recall	3+2
	13	Carbohydrate chemistry and metabolism	Understanding +Applied	3+2
	14	Carbohydrate chemistry and metabolism	Understanding +Applied	3+2
	15	Carbohydrate chemistry and metabolism	Understanding +Applied	3+2

PAPER - 1 BLUEPRINT – II

QUESTIONS	Q. No	SYSTEM WISE Blueprint – II	TYPE OF QUESTIONS	DISTRIBUTION OF MARKS
Section B (Cell , subcellular organelles and fluid and electrolyte balance Amino acid chemistry and metabolism, Plasma proteins, Extra cellular matrix, Hemoglobin chemistry and metabolism)				
I.LAQ 1X10	1	Hemoglobin chemistry and metabolism	Understanding +Applied	6+2
II.SAQ 6X5=30	2	Aminoacid chemistry & metabolism	Understanding+ recall	3+2
	3	Aminoacid chemistry & metabolism	Understanding +Applied	3+2
	4	Cell and subcellular organelles	Understanding	5
	5	Fluid and electrolyte balance	Understanding +Applied	3+2
	6	Aminoacid chemistry	Understanding	3+2

		&metabolism	+Applied	
	7	Plasma proteins / Extra cellular matrix	Understanding +Applied	3+2
Section C (Enzymology, Immunology, Carbohydrate chemistry and metabolism, Biological oxidation, Electron transport chain, Integration of metabolism)				
I.LAQ 1X10	8	Carbohydrate metabolism	Understanding +Applied	6+4
II.SAQ 6X5=30	9	Immunology	Understanding	5
	11	Biological oxidation, Electron transport chain, Integration of metabolism	Understanding +Recall	3+2
	12	Carbohydrate chemistry and metabolism	Understanding +Recall	3+2
	13	Carbohydrate chemistry and metabolism, Biological oxidation, Electron transport chain, Integration of metabolism	Understanding +Applied	3+2
	14	Enzymology	Understanding	5
	15	Enzymology	Understanding +Applied	3+2

PAPER II	MCQ
Lipid chemistry and metabolism	4
MOLECULAR BIOLOGY, Xenobiotics, Free radicals	4
Cancer biology	2
ABG and Organ function test	1
Vitamins, minerals	2
Nutrition	4
TOTAL	20

QUESTIONS	Q.No	SYSTEM WISE Blueprint – I	TYPE OF QUESTIONS	DISTRIBUTION OF MARKS
Section A (Lipid chemistry and metabolism, Molecular biology, Cancer biology, Xenobiotics, Free radicles)				
II.LAQ 1X10	1	Lipid metabolism	Understanding +Applied	7+3
II.SAQ 6X5=30	2	Lipid chemistry and metabolism	Understanding and recall	3+2
	3	Lipid chemistry and metabolism	Understanding +Applied	3+2
	4	Molecular biology	Understanding and Applied	3+2
	5	Molecular biology	Understanding	5
	6	Molecular biology	Understanding +Applied	2+3
	7	Cancer biology, Xenobiotics, Free radicles	Understanding	5
Section B (ABG and Organ function test , Vitamins, minerals, Nutrition)				
II.LAQ 1X10	8	Vitamins/minerals	Understanding +Applied	7+3
II.SAQ 6X5=30	9	Vitamins/minerals	Understanding and recall	3+2
	11	Vitamins/minerals	Understanding	5
	12	Organ function test	Understanding +Applied	3+2
	13	Organ function test	Understanding +Applied	2+3
	14	ABG	Understanding	5
	15	Nutrition	Understanding +Applied	3+2

QUESTIONS	Q. NO	SYSTEM WISE Blueprint – II	TYPE OF QUESTIONS	DISTRIBUTION OF MARKS
Section A Section A (Lipid chemistry and metabolism, Molecular biology, Cancer biology, Xenobiotics, Free radicles)				
I.LAQ 1X10	1	Molecular biology	Understanding +Applied	7+3
II.SAQ 6X5=30	2	Lipid chemistry and metabolism	Understanding and recall	3+2
	3	Lipid chemistry and metabolism	Understanding +Applied	3+2
	4	Lipid chemistry and metabolism	Understanding +Applied	2+3
	5	Lipid chemistry and metabolism	Understanding	5
	6	Molecular biology	Understanding and applied	3+2
	7	Cancer biology, Xenobiotics, Free radicles	Understanding	5
Section B (ABG and Organ function test , Vitamins, minerals, Nutrition)				
I.LAQ 1X10	8	Organ function test	Understanding +Applied	7+3
II.SAQ 6X5=30	9	Vitamins	Understanding and recall	3+2
	11	Vitamins	Understanding +Applied	3+2
	12	Minerals	Understanding +Applied	4+1
	13	Minerals	Understanding	5
	14	ABG	Understanding +Applied	3+2
	15	Nutrition	Understanding +Applied	3+2

SRI BALAJI VIDYAPEETH
DEPARTMENT OF BIOCHEMISTRY
(Blue Print – 1) MODEL QUESTION PAPER – I

Duration: 3 hours

Max. Mark: 100

Direction:

- *Section A is to be attempted in special shading sheet. No negative marking for wrong answers.*
 - *Write section B & section C in separate sheets*
 - *All question need to be answered*
 - *Answers specific to the questions asked. Draw schematic diagram wherever necessary.*
-

Section A (20 marks)

MCQ **1X20=20**

Section B (40 marks)

Long Answer Question **1X10=10**

1. Explain the process of formation, transport and detoxification of ammonia with suitable illustration and reactions. (2+2+6)

Short Answers Questions **6X5=30**

2. Name the different types of tyrosinaemia with their enzyme defect.
3. Define denaturation of proteins and comment on its effect on the different levels of structural organization of proteins. Name any three biomedical applications of denaturation of proteins.
4. List the components of the bio-membranes with suitable illustration.
5. Explain Primary & Secondary active transport with suitable illustration.
6. Name the rate limiting steps in heme synthesis and explain how they Regulate.
7. Write the enzyme defect, clinical feature and laboratory finding of Acute Intermittent Porphyria.

Section C (40 marks)

Long Answer Question **1X10=10**

8. Explain in detail the different types of enzyme inhibition with suitable example for each

Short Answer Question **6X5=30**

9. Draw a neat labeled diagram to illustrate the structure of an immunoglobulin and mention functions of them.
10. Explain Chemiosmotic theory with suitable illustration

11. Define heteropolysaccharides. Name any FOUR with their composition, and list any two functions.
12. Write the biochemical defect, clinical features and diagnostic tests for Classical Galactosemia.
13. Describe Rapoport Luebering cycle with suitable illustration and write the significance of 2, 3 Bisphosphoglycerate.
14. What is normal Fasting blood glucose level and Explain the hormonal regulations of blood glucose level in fasting stage?

SRI BALAJI VIDYAPEETH
DEPARTMENT OF BIOCHEMISTRY
MODEL QUESTION PAPER – II

Duration: 3 hours

Max. Mark: 100

Direction:

- Section A is to be attempted in special shading sheet. No negative marking for wrong answers.
 - Write section B & section C in separate sheets
 - All questions need to be answered
 - Answers specific to the questions asked. Draw schematic diagram wherever necessary.
-

	Section A (20 marks)		1X20=20
MCQ			
	Section B (40 marks)		
Long Answer Question			1X10=10

1. a) Explain how fatty acids are activated and transported into mitochondria with suitable illustrations. b) List the steps involved in the conversion of fatty acids to acetyl COA with suitable enzymes and coenzymes (3+7=10 marks).

Short Answers Question	6X5=30
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2. Explain "reverse cholesterol transport pathway" with suitable illustrations
3. Classify eicosanoids and give one example for each
4. Define "codon". Mention the properties of "Genetic code"
5. Explain different types of post-translational modifications
6. Draw and label the structure of tRNA
7. What are protooncogenes? Explain any 4 mechanisms by which they are activated to cancer-producing oncogenes.

	Section C (40 marks)		1X10=10
Long Answer Question			

8. Discuss vitamin A under the following headings, sources, RDA, Absorption, Transport, the role of cis-retinal in Wald's visual cycle and deficiency manifestations. (1+1+2+1+3+2)

Short Answers Question	6X5=30
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9. Write the coenzyme form and biochemical functions of vitamin Pyridoxine.
10. Explain „folate trap"? How does it affect the metabolism of one-carbon moieties?
11. Enumerate the liver function tests and describe in detail any three of them.
12. Mention the renal clearance tests? Write in detail of any two of them.
13. Mention the laboratory changes associated with metabolic acidosis and causes.
14. What is glycemic index and mention its significance.

SRI BALAJI VIDYAPEETH
DEPARTMENT OF BIOCHEMISTRY
(Blue Print – 2) MODEL QUESTION PAPER – I

Duration: 3 hours

Max. Mark: 100

Direction:

- *Section A is to be attempted in special shading sheet. No negative marking for wrong answers.*
- *Write section B & section C in separate sheets*
- *All question need to be answered*
- *Answers specific to the questions asked. Draw schematic diagram wherever necessary.*

Section A (20 marks)

MCQ

1X20=20

Section B (40 marks)

Long Answer Question

1X10=10

1. Enumerate the steps involved in breakdown of heme. List the different types of porphyria with their biochemical defect.

Short Answers Question

6X5=30

2. List any five metabolic function of methionine.
3. Explain secondary structure of protein with suitable diagram.
4. Draw a neat labelled diagram to represent the “Fluid mosaic model” of biomembranes.
5. Name any four electrolytes and compare the composition of electrolytes in the extracellular and intracellular fluids.
6. What are polyamines? List any four functions of polyamines
7. What is acute phase reactant? Mention their clinical significance with two examples

Section C (40 marks)

Long Answer Question

1X10=10

8. Explain the regulation of blood glucose in well fed and fasting state. Mention the diagnostic criteria for diabetes mellitus

Short Answers Question

6X5=30

9. Draw a neat labeled diagram to illustrate the structure of an immunoglobulin and mention functions of them. List various types of immunoglobulins with its functions.
10. Define uncouplers and mention three suitable examples for uncouplers.

11. Mention the significance of HMP shunt pathway. Add a note on G6PD deficiency.
12. List the Glycogen Storage Diseases with their biochemical defect. Explain biochemical basis of hyperuricemia in Von-gierke's disease
13. Explain the role of enzymes kinetics with suitable illustration in the diagnosis of AMI.
14. List any five enzymes which are used as therapeutic agent and mention their use.

SRI BALAJI VIDYAPEETH
DEPARTMENT OF BIOCHEMISTRY
MODEL QUESTION PAPER – II

Duration: 3 hours

Max. Mark: 100

Direction:

- Section A is to be attempted in special shading sheet. No negative marking for wrong answers.
 - Write section B & section C in separate sheets
 - All questions need to be answered
 - Answers specific to the questions asked. Draw schematic diagram wherever necessary.
-

Section A (20 marks)

MCQ

1X20=20

Section B (40 marks)

Long Answer Question

1X10=10

1. Explain the three stages of “translation”, Initiation, elongation and termination with suitable illustrations. List any TWO inhibitors of translation. (8+2=10 marks)

Short Answers Question

6X5=30

2. List any five biomedical importance of lipid
3. What are “LIPOSOMES”? How they are synthesized? Mention any TWO applications of Liposomes in modern medicine
4. What are steatorrhea? Mention the two differences between split and unsplit fats
5. Describe the pathway for Ketone body synthesis and list 3 causes for ketosis.
6. Explain schematic illustrations the lac operon concept.
7. Name any five tumor markers used in the diagnosis of cancer. With example

Section C (40 marks)

Long Answer Question

1X10=10

8. What is jaundice? Mention the different types of jaundice? Explain how will you differentiate the types of jaundice by using various biochemical tests (1+2+7=10 marks).

Short Answers Question

6X5=30

9. Which vitamin deficiency causes Beriberi and explain the biochemical basis and write its functions.
10. Explain the biochemical functions and deficiency manifestations of Niacin
11. Explain with a schematic diagram how iron is absorbed, transported, metabolized and stored in our body.

12. List any FOUR biochemical functions of copper and its deficiency manifestations in human
13. Explain the role of kidney in maintain the acid base balance in our body with appropriate schematic diagram
14. What are Dietary fibers and mention any Four clinical significance of dietary fibers.

14. Recommended Books

(Latest editions of the following books are recommended)

Anatomy

1. Moore clinically oriented Anatomy- Keith L. Moore et al- Wolters Kluwer
2. Gray's Anatomy- The anatomical basis of clinical practice- Susan Standring- Elsevier
3. Atlas of Human Anatomy – Frank H. Netter- Elsevier
4. Cunningham's Manual of practical Anatomy (3 volumes)- Rachel Koshi - Oxford medical publications
5. Clinical Anatomy by regions- Richard S. Snell – Wolters Kluwer
6. Langman's Medical Embryology – T.W. Sadler – Wolters Kluwer
7. diFiore's Atlas of Histology with Functional Correlations – Victor P. Eroschenko - Wolters Kluwer
8. Clinical Neuroanatomy-Vishram Singh-Elsevier
9. Clinical Neuroanatomy - Richard S. Snell – Wolters Kluwer

Physiology

1. Comprehensive Text book of Medical Physiology, Volume – I & Volume – II G K Pal Pravati Pal, Jaypee publications
2. Guyton & Hall Text book of Medical Physiology. Second South Asian Edition, Elsevier publications
3. Text book of Practical Physiology. G K Pal Pravati Pal, University press, 4th Edition
4. Text book of Medical Physiology, Indu khurana Arushi Khurana, Elsevier
5. Illustrated reviews physiology. Robin R Preston, Thad E Wilson. Wolters Kluwer

Biochemistry

1. Murray RK, Granner DK, Mayes PA, Rodwell VW. Harper's illustrated biochemistry. McGraw-hill; 2014
2. Harvey RA, Ferrier DR. Lippincott's illustrated reviews: Biochemistry
3. Vasudevan DM, Sreekumari S, Vaidyanathan K. Textbook of biochemistry for medical students. JP Medical Ltd; 2013
4. Puri D. Textbook of Medical Biochemistry. Elsevier Health Sciences; 2018