

MBBS

Program outcomes and course outcomes for MBBS (Bachelor of Medicine, Bachelor of Surgery) programs typically align with the overarching goals of medical education, ensuring that graduates possess the necessary knowledge, skills, and attitudes to practice medicine competently and ethically. Here's a general framework for program outcomes and course outcomes in an MBBS program:

PROGRAM OUTCOMES

PO1: Medical Knowledge and Skills:

At the end of MBBS, medical graduates should be able to

- demonstrate comprehensive knowledge of clinical sciences, perform accurate clinical assessments, analyze clinical problems critically and develop appropriate treatment plans.

PO2: Professionalism and Responsibilities:

At the end of MBBS, medical graduates should be able to

- exhibit ethical conduct, integrity, and adherence to legal standards in medical practice, research, and interactions with patients and colleagues.
- respect patients' autonomy, privacy, and confidentiality.

PO3: Communication Skills:

At the end of MBBS, medical graduates should be able to

- communicate effectively with patients, families, and colleagues clearly, empathetically, and culturally sensitively.

PO4: Patient Care:

At the end of MBBS, medical graduates should be able to

- provide compassionate, patient-centered care
- address the physical, psychological, and social needs of patients.

PO5: Lifelong Learning and Professional Development:

At the end of MBBS, medical graduates should be able to

- engage in continuous learning and self-improvement to maintain competence.
- stay updated with advances in medical knowledge, technology, and healthcare practices.

PO6: Leadership and Advocacy:

At the end of MBBS, medical graduates should be able to

- demonstrate leadership skills and advocate for the health needs of patients and communities.

COURSE OUTCOMES

ANATOMY

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

CO1: Understanding of Human Body Systems: Students should demonstrate a thorough understanding of the anatomical structures of all major systems of the human body, including the skeletal, muscular, nervous, cardiovascular, respiratory, digestive, urinary, and reproductive systems.

CO2: Histology: Students should have a basic understanding of histology, including the microscopic structure of tissues and organs, and be able to correlate histological features with their anatomical counterparts.

CO3: Embryology: Students should understand the basic principles of embryology, including the development of organ systems from embryonic germ layers and the formation of anatomical structures during fetal development.

CO4: Radiological Anatomy: Students should be able to identify anatomical structures on medical imaging studies, such as X-rays, CT scans, MRI scans, and ultrasound, and understand how anatomical variations and pathologies are visualized on these images.

CO5: Integration with Clinical Practice: Students should understand the clinical relevance of anatomical knowledge and be able to apply anatomical principles to clinical scenarios, such as diagnosing diseases, interpreting medical imaging, and performing surgical procedures.

CO6: Ethical and Professional Considerations: Students should demonstrate an understanding of ethical and professional considerations related to the study and practice of anatomy, including respect for human cadavers, patient confidentiality, and informed consent.

CO7: Communication Skills: Students should be able to effectively communicate anatomical concepts and findings to patients, colleagues, and other healthcare professionals, both verbally and in written form.

CO8: Critical Thinking and Problem-Solving: Students should develop critical thinking skills and be able to analyze complex anatomical problems, integrate information from multiple sources, and propose appropriate solutions.

	PO1	PO2	PO3	PO4	PO5	PO6	PO Avg.
CO1	3	1	1	1	1	0	1.2
CO2	3	1	1	1	1	0	1.2
CO3	3	1	1	1	1	0	1.2
CO4	3	1	1	3	1	0	1.5
CO5	3	3	2	3	2	2	2.5
CO6	2	3	2	3	2	2	2.3
CO 7	2	3	3	3	1	2	2.5
CO 8	3	2	2	2	3	3	1.8
CO Avg.	2.8	1.9	1.6	2.1	1.4	1.1	1.8

(0-no correlation; 1-low correlation; 2-medium correlation; 3-high correlation)

PHYSIOLOGY

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

CO1: Understanding of Cellular Physiology: Students should demonstrate a thorough understanding of cellular physiology, including cell structure and function, membrane transport, cellular metabolism, and cell signaling.

CO2: Knowledge of Organ System Physiology: Students should have a detailed understanding of the physiology of major organ systems, including the nervous system, cardiovascular system, respiratory system, gastrointestinal system, renal system, endocrine system, and reproductive system.

CO3: Integration of Physiological Processes: Students should be able to integrate the functions of different organ systems to understand the physiological regulation of homeostasis, including the coordination of organ systems in response to internal and external stimuli.

CO4: Laboratory Skills: Students should develop proficiency in basic laboratory techniques used in the study of physiology.

CO5: Ethical and Professional Considerations: Students should demonstrate an understanding of ethical and professional considerations related to the study and practice of physiology, including respect for human subjects, research ethics, and professionalism in healthcare.

CO6: Communication Skills: Students should be able to effectively communicate physiological concepts and findings to patients, colleagues, and other healthcare professionals, both verbally and in written form.

CO7: Integration with Clinical Practice: Students should understand the relevance of physiological principles to clinical practice and be able to apply physiological concepts in the diagnosis, treatment, and management of medical conditions.

CO8: Lifelong Learning: Students should recognize the importance of lifelong learning in the field of physiology and be prepared to stay updated with advances in the field throughout their medical careers.

	PO1	PO2	PO3	PO4	PO5	PO6	PO Avg.
CO1	3	1	1	1	3	0	1.5
CO2	3	1	1	1	3	0	1.5
CO3	3	1	1	1	3	0	1.5
CO4	3	1	1	2	3	1	1.8
CO5	3	3	2	3	2	2	2.3
CO6	2	3	3	3	1	2	2.3
CO 7	2	3	2	3	3	2	2.7
CO 8	3	2	1	2	3	3	2.3
CO Avg.	2.8	1.9	1.6	2.0	2.6	1.3	2.0

(0=no correlation; 1-low correlation; 2-medium correlation; 3-high correlation)

BIOCHEMISTRY

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

CO1: Understanding of Biomolecules: Students should demonstrate a thorough understanding of the structure, function, and metabolism of major biomolecules, including carbohydrates, lipids, proteins, nucleic acids, and their derivatives.

CO2: Enzyme Kinetics and Regulation: Students should understand the principles of enzyme kinetics and enzyme regulation, including factors affecting enzyme activity, enzyme inhibition, and allosteric regulation.

CO3: Molecular Genetics: Students should understand the molecular basis of genetic information flow, including DNA replication, transcription, translation, and regulation of gene expression.

CO4: Biochemical Techniques: Students should develop proficiency in basic biochemical techniques used in the study of biomolecules and metabolic pathways.

CO5: Ethical and Professional Considerations: Students should demonstrate an understanding of ethical and professional considerations related to the study and practice of biochemistry, including research ethics, patient confidentiality, and professionalism in healthcare.

CO6: Communication Skills: Students should be able to effectively communicate biochemical concepts and findings to patients, colleagues, and other healthcare professionals, both verbally and in written form.

CO7: Integration with Clinical Practice: Students should understand the relevance of biochemistry to clinical practice and be able to apply biochemical concepts in the diagnosis, treatment, and management of medical conditions.

CO8: Lifelong Learning: Students should recognize the importance of lifelong learning in the field of biochemistry and be prepared to stay updated with advances in the field throughout their medical careers.

	PO1	PO2	PO3	PO4	PO5	PO6	PO Avg.
CO1	3	1	1	1	3	0	1.5
CO2	3	1	1	1	3	0	1.5
CO3	3	1	1	1	3	0	1.5
CO4	3	1	1	2	3	1	1.8
CO5	3	3	2	3	2	2	2.3
CO6	2	3	3	3	1	2	2.3
CO 7	2	3	2	3	3	2	2.7
CO 8	3	2	1	2	3	3	2.3
CO Avg.	2.8	1.9	1.6	2.0	2.6	1.3	2.0

(0-no correlation; 1-low correlation; 2-medium correlation; 3-high correlation)

PATHOLOGY

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

CO1: Understanding of Disease Processes: Students should demonstrate a thorough understanding of the basic principles of disease pathology, including the etiology, pathogenesis, and morphological changes associated with various diseases.

CO2: Knowledge of Systemic Pathology: Students should have a detailed understanding of the pathological changes affecting different organ systems, including the cardiovascular system, respiratory system, gastrointestinal system, renal system, hematopoietic system, endocrine system, and reproductive system.

CO3: Integration of Pathophysiology: Students should be able to integrate pathological concepts with pathophysiological processes to understand the clinical manifestations of diseases and their impact on organ function.

CO4: Diagnostic Pathology: Students should develop proficiency in interpreting pathological specimens, including histological slides, cytology specimens, and imaging studies .

CO5: Ethical and Professional Considerations: Students should demonstrate an understanding of ethical and professional considerations related to the study and practice of pathology, including respect for patient confidentiality, informed consent, and professionalism in healthcare.

CO6: Communication Skills: Students should be able to effectively communicate pathological findings and diagnoses to patients, colleagues, and other healthcare professionals, both verbally and in written form.

CO7: Integration with Clinical Practice: Students should be able to correlate pathological changes with clinical presentations, laboratory findings, and medical imaging studies, and be able to apply pathological concepts in the diagnosis, treatment, and management of medical conditions.

CO8: Lifelong Learning: Students should recognize the importance of lifelong learning in the field of pathology and be prepared to stay updated with advances in the field throughout their medical careers.

	PO1	PO2	PO3	PO4	PO5	PO6	PO Avg.
CO1	3	1	1	1	3	0	1.5
CO2	3	1	1	1	3	0	1.5
CO3	3	1	1	1	3	0	1.5
CO4	3	1	1	2	3	1	1.8
CO5	3	3	2	3	2	2	2.3
CO6	2	3	3	3	1	2	2.3
CO 7	2	3	2	3	3	2	2.7
CO 8	3	2	1	2	3	3	2.3
CO Avg.	2.8	1.9	1.6	2.0	2.6	1.3	2.0

(0-no correlation; 1-low correlation; 2-medium correlation; 3-high correlation)

MICROBIOLOGY

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

CO1: Understanding of Microbial characteristics and their interaction with host: Students should demonstrate a thorough understanding of the structure, classification, and characteristics of bacteria, viruses, fungi, protozoa, and helminths. Students should have a detailed understanding of microbial metabolism, growth, replication, and genetics, including mechanisms of antimicrobial resistance and virulence factors. Students should understand the interactions between microorganisms and the human host, including mechanisms of infection, host defense mechanisms, and immune responses to microbial pathogens.

CO2: Diagnostic Microbiology: Students should develop proficiency in laboratory techniques used for the isolation, identification, and characterization of microbial pathogens, including culture, microscopy, serology, and molecular methods.

CO3: Antimicrobial Therapy: Students should understand the principles of antimicrobial therapy, including mechanisms of action, spectrum of activity, pharmacokinetics, and mechanisms of resistance of antimicrobial agents.

CO4: Epidemiology and Public Health: Students should understand the principles of epidemiology and their application to the prevention and control of infectious diseases, including surveillance, outbreak investigation, and vaccination programs.

CO5: Ethical and Professional Considerations: Students should demonstrate an understanding of ethical and professional considerations related to the study and practice of microbiology, including research ethics, patient confidentiality, and professionalism in healthcare.

CO6: Communication Skills: Students should be able to effectively communicate microbiological concepts, laboratory findings, and treatment recommendations to patients, colleagues, and other healthcare professionals, both verbally and in written form.

CO7: Integration with Clinical Practice: Students should understand the relevance of microbiology to clinical practice and be able to apply microbiological concepts in the diagnosis, treatment, prevention and management of infectious diseases.

CO8: Lifelong Learning: Students should recognize the importance of lifelong learning in the field of microbiology and be prepared to stay updated with advances in the field throughout their medical careers.

	PO1	PO2	PO3	PO4	PO5	PO6	PO Avg.
CO1	3	2	2	3	3	2	2.5
CO2	3	2	1	3	3	2	2.5
CO3	3	2	2	3	3	2	2.5
CO4	3	3	3	3	3	2	3
CO5	2	3	2	3	2	2	2.3
CO6	2	3	3	3	1	2	2.3
CO 7	3	3	2	2	3	2	2.7
CO 8	3	2	1	2	3	3	2.3
CO Avg.	2.8	2.5	2.0	2.8	2.6	2.3	2.5

(0-no correlation; 1-low correlation; 2-medium correlation; 3-high correlation)

PHARMACOLOGY

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

CO1: Understanding of Drug Classification and Action: Students should demonstrate a thorough ability to classify drugs based on their chemical structure, mechanism of action, therapeutic uses, and pharmacological effects. Mechanisms of drug action include pharmacokinetics, pharmacodynamics, pharmacogenomics and drug interactions.

CO2: Pharmacotherapy of Common Diseases: Students should have a detailed understanding of the pharmacological treatment of common diseases, including cardiovascular diseases, respiratory diseases, gastrointestinal diseases, central nervous system disorders, infectious diseases, and endocrine disorders. Students should understand the principles of rational drug use, including drug selection, dosage adjustment, drug combinations, and therapeutic drug monitoring, to optimize patient outcomes while minimizing adverse effects and drug interactions.

CO3: Adverse Drug Reactions: Students should understand the mechanisms of adverse drug reactions, including toxic effects, idiosyncratic reactions, and drug allergies, and be able to recognize and manage adverse drug reactions in clinical practice.

CO4: Clinical Pharmacology: Students should understand the principles of clinical pharmacology, including the design and interpretation of clinical trials, pharmacovigilance, and evidence-based medicine.

CO5: Ethical and Professional Considerations: Students should demonstrate an understanding of ethical and professional considerations related to the prescribing, dispensing, and administration of drugs, including informed consent, patient autonomy, and professionalism in healthcare.

CO6: Communication Skills: Students should be able to effectively communicate drug-related information to patients, colleagues, and other healthcare professionals, both verbally and in written form, including drug indications, dosages, adverse effects, and drug interactions.

CO7: Integration with Clinical Practice: Students should understand the relevance of pharmacology to clinical practice and be able to apply pharmacological principles in the rational prescribing, monitoring, and management of drug therapy for individual patients.

CO8: Lifelong Learning: Students should recognize the importance of lifelong learning in the field of pharmacology and be prepared to stay updated with advances in pharmacological research and drug therapy throughout their medical careers.

	PO1	PO2	PO3	PO4	PO5	PO6	PO Avg.
CO1	3	2	2	3	3	1	2.3
CO2	3	2	2	3	3	2	2.5
CO3	3	3	2	3	3	3	2.8
CO4	3	3	2	3	3	3	2.8
CO5	3	3	2	3	2	2	2.3
CO6	2	3	3	3	1	2	2.3
CO 7	2	3	2	3	3	2	2.7
CO 8	3	2	1	2	3	3	2.3
CO Avg.	2.8	2.6	2.0	2.9	2.6	2.3	2.5

(0-no correlation; 1-low correlation; 2-medium correlation; 3-high correlation)

COMMUNITY MEDICINE

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

CO1: Understanding of Public Health Principles: Students should demonstrate a thorough understanding of public health concepts, including the determinants of health, population health assessment, health promotion, disease prevention, and health policy. This must include strategies for primary, secondary, and tertiary prevention of communicable and non-communicable diseases. Students should understand the social determinants of health, including socioeconomic status, education, employment, housing, and access to healthcare, and recognize the importance of addressing health inequities to achieve health equity.

CO2: Epidemiological Methods: Students should be able to apply epidemiological methods to the study of disease distribution, risk factors, and health outcomes in populations, including study design, data collection, data analysis, and interpretation of epidemiological findings. Students should understand the principles of biostatistics and be able to apply statistical methods to the analysis of health data, including descriptive statistics, inferential statistics, hypothesis testing, and confidence intervals.

CO3: Maternal and Child Health: Students should have a detailed understanding of maternal and child health issues, including antenatal care, postnatal care, immunization programs, growth monitoring, and nutritional interventions to promote maternal and child health.

CO4: Environmental and Occupational Health: Students should understand the impact of environmental factors on health, including air and water pollution, occupational hazards, food safety, sanitation, and vector-borne diseases, and be able to identify and address environmental health risks in communities. Students should understand the principles of occupational health and safety, including workplace hazards, occupational diseases, injury prevention, and health promotion in the workplace.

CO5: Healthcare Delivery Systems and Health Policy and Advocacy: Students should have knowledge of healthcare delivery systems at the local, national, and global levels, including healthcare financing, organization of health services, and access to healthcare for underserved populations. Students should understand the role of health policy in shaping population health outcomes and be able to advocate for policies and interventions that promote health and reduce health disparities.

CO6: Ethical and Professional Considerations: Students should demonstrate an understanding of ethical and professional considerations related to the practice of community medicine, including respect for cultural diversity, social justice, and human rights.

CO7: Communication and Collaboration Skills: Students should be able to effectively communicate public health information to individuals, communities, and policymakers and collaborate with multidisciplinary teams to address public health challenges.

CO8: Community Engagement and Empowerment: Students should understand the importance of community engagement and empowerment in public health practice and be able to work collaboratively with communities to identify health needs, priorities, and solutions.

	PO1	PO2	PO3	PO4	PO5	PO6	PO Avg.
CO1	3	2	2	3	3	2	2.5
CO2	3	2	2	3	3	2	2.5
CO3	3	2	2	3	3	3	2.7
CO4	3	2	2	3	3	3	2.7
CO5	3	3	3	3	2	3	2.8

CO6	2	3	3	3	1	2	2.3
CO 7	2	3	3	3	3	2	2.7
CO 8	3	3	3	3	3	3	3
CO Avg.	2.8	2.5	2.5	3	2.6	2.5	2.7

(0-no correlation; 1-low correlation; 2-medium correlation; 3-high correlation)

FORENSIC MEDICINE

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

CO1: Understanding of Medicolegal Principles: Students should demonstrate a thorough understanding of the principles of forensic medicine and the legal framework governing the practice of forensic medicine, including laws, regulations, and ethical guidelines.

CO2: Medical Jurisprudence: Students should have knowledge of medical jurisprudence, including the legal responsibilities of healthcare professionals, medical ethics, consent, confidentiality, and the duty to report cases of suspected abuse or neglect.

CO3: Forensic Pathology, Toxicology, Psychiatry, Anthropology and Odontology: Students should understand the role of

- forensic pathology in the investigation of deaths, including the determination of cause of death, manner of death, time of death, and identification of human remains.
- toxicological analysis in the investigation of drug-related deaths, poisoning cases, and impairment from alcohol and other substances.
- forensic psychiatry in assessment and management of mentally disordered offenders, competency to stand trial, criminal responsibility, and risk assessment for violence and suicide.
- forensic anthropology in the identification of human remains, including methods of skeletal analysis, estimation of age, sex, and ancestry, and identification of trauma or pathology.
- forensic odontology, including the role of dental evidence in the identification of human remains, bite mark analysis, and dental age estimation.

CO4: Clinical Forensic Medicine: Students should have knowledge of clinical forensic medicine, including the examination and documentation of injuries, interpretation of medical evidence, and assessment of victims of violence, sexual assault, and torture.

CO5: Legal Procedures and Courtroom Testimony: Students should understand the legal procedures involved in the investigation and prosecution of crimes, including the role of forensic experts in court proceedings and the preparation and presentation of expert testimony.

CO6: Ethical and Professional Considerations: Students should demonstrate an understanding of ethical and professional considerations related to the practice of forensic medicine, including impartiality, objectivity, integrity, and respect for the rights of individuals involved in legal proceedings.

CO7: Communication Skills: Students should be able to effectively communicate forensic findings and expert opinions to law enforcement agencies, legal professionals, and the judiciary, both verbally and in written form.

CO8: Interdisciplinary Collaboration: Students should be able to collaborate effectively with law enforcement agencies, legal professionals, forensic scientists, and other healthcare professionals in the investigation and resolution of legal cases.

	PO1	PO2	PO3	PO4	PO5	PO6	PO Avg.
CO1	3	3	3	1	3	2	2.5
CO2	3	3	3	1	3	2	2.5
CO3	3	3	3	1	3	2	2.5
CO4	3	3	3	1	3	2	2.5
CO5	3	3	2	3	2	2	2.3
CO6	2	3	3	3	1	2	2.3
CO 7	2	3	2	3	3	2	2.7
CO 8	3	2	1	2	3	3	2.3
CO Avg.	2.8	2.9	2.5	1.7	2.6	2.1	2.4

(0-no correlation; 1-low correlation; 2-medium correlation; 3-high correlation)

GENERAL MEDICINE (including Psychiatry, Dermatology and S.T.D.)

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

CO1: Clinical and Diagnostic Skills: Students should demonstrate a thorough understanding of the basic sciences underlying medical practice. Students should develop proficiency in obtaining comprehensive medical histories and performing systematic physical examinations, including the recognition of normal and abnormal findings. Students should be able to interpret clinical findings, laboratory tests, and imaging studies to formulate accurate differential diagnoses and develop appropriate management plans for common medical conditions across various organ systems, including cardiovascular diseases, respiratory diseases, gastrointestinal diseases, endocrine disorders, renal diseases, hematological disorders, and rheumatological disorders.

CO2: Dermatology, STD, Psychiatry: Students should be able to identify and describe the clinical features, pathophysiology, natural history of dermatological conditions and STD. Students should be able to interpret diagnostic tests and prescribe appropriate treatment for the same. Students should be able to demonstrate an understanding of the definition, scope, and importance of mental health and mental illness, including classification of disorders, their assessment, diagnosis and treatment.

CO3: Acute, Emergency Medicine and Chronic Disease Management: Students should be able to recognize and manage acute and life-threatening medical emergencies, including cardiopulmonary resuscitation, shock, acute coronary syndromes, respiratory failure, acute kidney injury, and diabetic emergencies. Students should understand the principles of chronic disease management, including risk factor modification, long-term pharmacological therapy, lifestyle interventions, and monitoring for disease progression and complications.

CO4: Geriatric Medicine and Palliative Care: Students should have knowledge of the unique health issues affecting older adults, including multimorbidity, polypharmacy, geriatric syndromes, cognitive impairment, falls, and end-of-life care, and be able to provide comprehensive care for elderly patients. Students should understand the principles of palliative care and end-of-life care, including symptom management, communication skills, advance care planning, and support for patients and families facing life-limiting illnesses.

CO5: Preventive Medicine: Students should understand the principles of preventive medicine and be able to provide preventive care, including health promotion, disease prevention, immunization, screening for common diseases, and counseling for healthy lifestyle behaviors.

CO6: Ethical and Professional Considerations: Students should demonstrate an understanding of ethical and professional considerations related to the practice of medicine, including patient autonomy, informed consent, confidentiality, and professionalism in healthcare.

CO7: Communication Skills: Students should be able to effectively communicate with patients, families, and colleagues, demonstrating empathy, compassion, and cultural sensitivity, and providing clear explanations and counseling about medical conditions and treatment options.

CO8: Interdisciplinary Collaboration: Students should be able to collaborate effectively with other healthcare professionals, including specialists, nurses, allied health professionals, and social workers, to provide comprehensive and coordinated care for patients.

	PO1	PO2	PO3	PO4	PO5	PO6	PO Avg.
CO1	3	3	3	3	3	2	2.8
CO2	3	3	3	3	3	2	2.5
CO3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	2	2.8
CO5	3	3	2	2	2	3	2.5
CO6	3	3	2	3	2	2	2.3
CO 7	2	3	3	3	1	2	2.3
CO 8	3	2	3	2	3	3	2.7
CO Avg.	2.9	2.9	2.8	2.8	2.5	2.3	2.7

(0-no correlation; 1-low correlation; 2-medium correlation; 3-high correlation)

GENERAL SURGERY (including orthopaedics, anesthesia, dental diseases and radiology)

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

CO1 Surgical Anatomy, Anesthesia, techniques, dental diseases and radiology: Students should demonstrate a thorough understanding of surgical anatomy, and should develop proficiency in basic surgical techniques, including aseptic technique, tissue handling, knot tying, suturing, and surgical instrument handling. Students should demonstrate understanding of the basic principles of anesthesia and airway management techniques. Students should demonstrate understanding of radiological anatomy and interpretation of radiological imaging. They must also know about common dental diseases.

CO2: Preoperative, Intraoperative, Postoperative care: Students should be able to perform comprehensive preoperative evaluations of surgical patients, including history-taking, physical examination, assessment of surgical risk, and optimization of medical conditions. Students should understand the principles of safe surgical practice and be able to assist in surgical procedures, including patient positioning, tissue dissection, hemostasis, wound closure, and management of surgical complications. Students should understand the principles of postoperative care and be able to monitor surgical patients in the postoperative period, including wound care, pain management, fluid and electrolyte management, and prevention of complications.

CO3: Common and Emergency Surgical Procedures: Students should have knowledge of the indications, techniques, and outcomes of common surgical procedures across various specialties, including gastrointestinal surgery, vascular surgery, breast surgery, endocrine surgery, trauma surgery, and surgical oncology. Students should understand the principles of emergency surgery and be able to manage surgical emergencies, including acute abdominal pain, gastrointestinal bleeding, traumatic injuries, and acute surgical infections.

CO4: Wound Healing and Tissue Repair: Students should understand the principles of wound healing and tissue repair, including the phases of wound healing, factors influencing wound healing, and management of acute and chronic wounds.

CO5: Orthopedics: Students should demonstrate a thorough understanding of musculoskeletal anatomy and biomechanical principles underlying normal musculoskeletal function and movement. Students should be able to perform comprehensive clinical evaluations of patients with orthopedic conditions, should understand the principles of diagnostic imaging modalities used in orthopaedics and should have knowledge of the principles of fracture/trauma management along with knowledge of orthopaedic surgical procedures.

CO6: Ethical and Professional Considerations: Students should demonstrate an understanding of ethical and professional considerations related to the practice of surgery, including informed consent, patient autonomy, confidentiality, and professionalism in healthcare.

CO7: Communication Skills: Students should be able to effectively communicate with surgical patients and their families, providing clear explanations about surgical procedures, risks, benefits, and postoperative care instructions.

CO8: Interdisciplinary Collaboration: Students should be able to collaborate effectively with other members of the surgical team, including anesthesiologists, nurses, surgical assistants, and allied health professionals, to provide safe and efficient surgical care.

	PO1	PO2	PO3	PO4	PO5	PO6	PO Avg.
CO1	3	3	3	3	3	2	2.8
CO2	3	3	3	3	3	2	2.5
CO3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	2	2.8
CO5	3	3	2	2	2	3	2.5
CO6	3	3	2	3	2	2	2.3
CO 7	2	3	3	3	1	2	2.3
CO 8	3	2	3	2	3	3	2.7
CO Avg.	2.9	2.9	2.8	2.5	2.5	2.3	2.7

(0-no correlation; 1-low correlation; 2-medium correlation; 3-high correlation)

OTORHINOLARYNGOLOGY

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

CO1: Anatomy and Physiology: Students should demonstrate a thorough understanding of the anatomy and physiology of the ear, nose, throat, head, and neck, including the structures and functions of the auditory system, nasal cavity, paranasal sinuses, larynx, pharynx, and cervical lymphatics.

CO2: Clinical Evaluation: Students should be able to perform comprehensive clinical evaluations, diagnosis and management of patients with otorhinolaryngological or head and neck disorders.

CO3: Otorhinolaryngological Surgery: Students should have knowledge of common otorhinolaryngological and common head and neck surgical procedures.

CO4: Head and neck Surgery: Students should have knowledge of common head and neck surgical procedures.

CO5: Audiology and Hearing Rehabilitation: Students should understand the principles of audiology and hearing rehabilitation, including audiometry, tympanometry, hearing aid fitting, cochlear implants, and auditory rehabilitation programs.

CO6: Ethical and Professional Considerations: Students should demonstrate an understanding of ethical and professional considerations related to the practice of otorhinolaryngology, including patient autonomy, informed consent, confidentiality, and professionalism in healthcare.

CO7: Communication Skills: Students should be able to effectively communicate with otorhinolaryngology patients and their families, providing clear explanations about otorhinolaryngological conditions, treatment options, and postoperative care instructions.

CO8: Interdisciplinary Collaboration: Students should be able to collaborate effectively with other members of the healthcare team, including audiologists, speech therapists, radiologists, and anesthesiologists, to provide comprehensive otorhinolaryngological care.

	PO1	PO2	PO3	PO4	PO5	PO6	PO Avg.
CO1	3	3	3	3	3	2	2.8
CO2	3	3	3	3	3	2	2.5
CO3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	2	2.8
CO5	3	3	3	2	2	1	2.3
CO6	3	3	2	3	2	2	2.3
CO 7	2	3	3	3	1	2	2.3
CO 8	3	2	3	2	3	3	2.7
CO Avg.	2.9	2.9	2.9	2.5	2.5	2.3	2.7

(0-no correlation; 1-low correlation; 2-medium correlation; 3-high correlation)

OPHTHALMOLOGY

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

CO1: Anatomy and Physiology of the Eye: Students should demonstrate a thorough understanding of the anatomy and physiology of the eye, including the structures and functions of the cornea, iris, lens, retina, optic nerve, and extraocular muscles.

CO2: Clinical Evaluation: Students should be able to perform comprehensive clinical evaluations of patients with ophthalmological conditions, including history-taking, visual acuity assessment, external examination, slit-lamp biomicroscopy, and fundoscopic examination.

CO3: Refractive Errors and Optics: Students should understand the principles of refraction, including myopia, hyperopia, astigmatism, and presbyopia, and be able to perform objective and subjective refraction to prescribe corrective lenses.

CO4: Diagnosis and Management of Ocular Disorders: Students should understand the pathophysiology, clinical manifestations, diagnosis, and management of ocular disorders.

CO5: Ophthalmic Surgery: Students should have knowledge of common ophthalmic surgical procedures and management of ocular trauma.

CO6: Ethical and Professional Considerations: Students should demonstrate an understanding of ethical and professional considerations related to the practice of ophthalmology, including patient autonomy, informed consent, confidentiality, and professionalism in healthcare.

CO7: Communication Skills: Students should be able to effectively communicate with ophthalmology patients and their families, providing clear explanations about ophthalmological conditions, treatment options, and postoperative care instructions.

CO8: Interdisciplinary Collaboration: Students should be able to collaborate effectively with other members of the healthcare team, including optometrists, opticians, neurologists, and anesthesiologists, to provide comprehensive ophthalmological care.

	PO1	PO2	PO3	PO4	PO5	PO6	PO Avg.
CO1	3	3	3	3	3	2	2.8
CO2	3	3	3	3	3	2	2.5
CO3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	2	2.8
CO5	3	3	2	2	2	3	2.5
CO6	3	3	2	3	2	2	2.3
CO 7	2	3	3	3	1	2	2.3
CO 8	3	2	3	2	3	3	2.7
CO Avg.	2.9	2.9	2.8	2.5	2.5	2.3	2.7

(0-no correlation; 1-low correlation; 2-medium correlation; 3-high correlation)

PEDIATRICS

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

CO1: Growth and Development: Students should demonstrate a thorough understanding of normal growth and development from infancy through adolescence, including physical, cognitive, emotional, and social milestones. Students should understand the principles of developmental and behavioral pediatrics, including assessment and management of developmental delays, autism spectrum disorders, attention-deficit/hyperactivity disorder (ADHD), and behavioral problems.

CO2: Pediatric History Taking and Physical Examination: Students should develop proficiency in obtaining comprehensive pediatric histories and performing systematic physical examinations of children of all ages, including newborns, infants, toddlers, preschoolers, school-aged children, and adolescents.

CO3: Health Maintenance and Preventive Care: Students should understand the principles of pediatric health maintenance and preventive care, including well-child visits, immunizations, developmental screening, anticipatory guidance, and screening for common pediatric conditions. Students should have knowledge of pediatric nutrition and feeding, including breastfeeding, formula feeding, introduction of solid foods, nutritional requirements at different stages of childhood, and management of common feeding problems.

CO4: Diagnosis and Management of Common and Emergency Pediatric Illnesses: Students should understand the pathophysiology, clinical manifestations, diagnosis, and management of common pediatric illnesses, including respiratory infections, gastrointestinal infections, febrile illnesses, urinary tract infections, and skin infections. Students should understand the principles of managing pediatric emergencies, including assessment and management of pediatric trauma, respiratory distress, shock, seizures, and poisoning, and recognition of warning signs of serious illness.

CO5: Acute and Chronic Pediatric, neonatal and adolescent Conditions: Students should have knowledge of the diagnosis and management of acute and chronic pediatric, neonatal and adolescent conditions, including asthma, allergic disorders, diabetes mellitus, epilepsy, congenital heart disease, and genetic disorders; respiratory distress syndrome, jaundice, and hypoglycaemia; puberty, sexuality, contraception, sexually transmitted infections, substance abuse, mental health disorders, and eating disorders.

CO6: Ethical and Professional Considerations: Students should demonstrate an understanding of ethical and professional considerations related to the practice of pediatrics, including respect for children's rights, confidentiality, parental autonomy, and professionalism in healthcare.

CO7: Communication Skills: Students should be able to effectively communicate with pediatric patients and their families, providing clear explanations about pediatric conditions, treatment options, and preventive care recommendations, and demonstrating empathy and sensitivity to the needs of children and families.

CO8: Interdisciplinary Collaboration: Students should be able to collaborate effectively with other members of the healthcare team, including pediatricians, nurses, social workers, psychologists, and child life specialists, to provide comprehensive pediatric care.

	PO1	PO2	PO3	PO4	PO5	PO6	PO Avg.
CO1	3	3	3	3	3	2	2.8
CO2	3	3	3	3	3	2	2.5
CO3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	2	2.8
CO5	3	3	2	2	2	3	2.5
CO6	3	3	2	3	2	2	2.3
CO 7	2	3	3	3	1	2	2.3
CO 8	3	2	3	2	3	3	2.7
CO Avg.	2.9	2.9	2.8	2.5	2.5	2.3	2.7

(0-no correlation; 1-low correlation; 2-medium correlation; 3-high correlation)