

GURU KASHI UNIVERSITY



Bachelor in Anesthesia & Operation Theatre Technology (BOAT)

Single Major (Annexure- III)

Session: 2025-26

Faculty of Health and Allied Science

Graduate Attributes of the Programme: - Bachelor of Science of
Operation Theater / Anesthesia Technician

Type of learning outcomes	The Learning Outcomes Descriptors
Graduates should be able to demonstrate the acquisition of:	
Learning outcomes that are specific to disciplinary/inter disciplinary areas of learning	Clinical & Technical Knowledge: Demonstrate a strong foundation in surgical procedures, anesthesia techniques, perioperative care, and emergency management.
	Operation Theater & Anesthesia Management: Apply sterilization protocols, infection control measures, and aseptic techniques to maintain a safe and controlled surgical environment.
	Equipment Handling & Maintenance: Operate, calibrate, and maintain anesthesia machines, ventilators, surgical instruments, and patient monitoring systems
	Research & Evidence-Based Practice: Integrate scientific research, best practices, and technological advancements to improve operation theater and anesthesia care
Generic learning outcomes	Communication Skills: Demonstrate effective verbal and written communication with patients, families, and healthcare professionals.
	Critical Thinking & Problem-Solving: Apply logical reasoning and evidence-based approaches to resolve challenges in operation theater and anesthesia management.
	Teamwork & Leadership: Function effectively both as a team member and leader in the operation theater, ensuring seamless coordination and task delegation
	Digital & Technological Literacy: Utilize modern medical technologies, digital healthcare systems, and software tools for efficient data management and patient care.
	Health & Safety Awareness: Ensure adherence to occupational health and safety standards, minimizing risks and hazards in the operation theater setting

Programme learning outcomes: An Undergraduate Certificate is awarded to students who have demonstrated the achievement of the outcomes located at level 4.5:

Element of the Descriptor	Programme learning out comes relating to Undergraduate Certificate
The graduates should be able to demonstrate the acquisition of:	
Knowledge and understanding	Understand the basic principles of surgical procedures, anesthesia techniques, and patient safety.
	Explain human anatomy, physiology, pharmacology of anesthetic drugs, and medical terminology related to OT and anesthesia.
	Demonstrate knowledge of infection control, aseptic techniques, and sterilization procedures. Recognize common surgical instruments, anesthesia machines, and patient monitoring devices.
General, technical and professional skills required to perform and accomplish tasks	Graduates should be able to: Assist in preoperative, intraoperative, and postoperative patient care.
	Operate and maintain basic anesthesia and surgical equipment. Follow standard operating procedures (SOPs) and hospital protocols.
	Monitor patient vitals and anesthesia effects under supervision
	Ensure accurate record-keeping and documentation of procedures.
Application of knowledge and skills	Graduates should be able to: Apply basic clinical and technical skills in real-world surgical and anesthesia settings. Identify and respond to common challenges in operation theaters and recovery rooms.
	Demonstrate competency in infection prevention and biomedical waste management.
	Work effectively under the guidance of anesthesiologists and surgeons
Generic learning outcomes	Graduates should be able to: Communicate clearly and professionally with patients, doctors, and medical staff.
	Work efficiently as part of a team in high-pressure surgical environments.
	Demonstrate time management, multitasking, and problem-solving abilities.

	Adapt to emerging medical technologies and evolving healthcare practices.
Constitutional, humanistic, ethical, and moral values	Graduates should be able to: Exhibit compassion, empathy, and respect towards patients and colleagues. Uphold ethical principles, patient confidentiality, and medical professionalism.
	Follow national healthcare laws, policies, and patient rights
	Act responsibly in handling medical emergencies and critical care situations
Employability and job-ready skills, and entrepreneurship skills and capabilities/qualities and mindset	Graduates should be able to: Possess the necessary skills to secure employment in hospitals, surgical centers, and emergency care units. Develop a professional mindset and readiness for industry-specific roles. Gain foundational knowledge for further studies or specialized training in OT or anesthesia technology.
	Identify opportunities for entrepreneurship in healthcare services, such as medical equipment handling, surgical assistance, or private healthcare support.
Credit requirements	The successful completion of the first year (two semesters) of the undergraduate programme of 44 credit hours followed by an exit 4-credit of internship (Total 48 Credits)
Entry requirements	10+2 Medical/Non-Medical with at least 45% in the aggregate.

**Minimum Credits required to get Certificate Course in Operation Theater / Anesthesia Technician = 44 + 4 #.

SEMESTER: 1st									
Course Code	Course Title	Type of Courses	L	T	P	No . of Credits	Int.	Ext.	Total Marks
BOA1100	General Anatomy	Core Course Theory	3	0	0	3	30	70	100
BOA1101	General Physiology	Core Course Theory	3	0	0	3	30	70	100
BOA1102	Introduction to OT	Minor Course	4	0	0	4	30	70	100
BOA1103	Introduction to Quality & Patient Safety	Skill Enhancement Course	3	0	0	3	30	70	100
BOA1104	Human Rights and Duties	Multidisciplinary Course	3	0	0	3	30	70	100
BOA1105	General Anatomy Lab	Core Course Practical	0	0	2	1	30	70	100
BOA1106	General Physiology Lab	Core Course Practical	0	0	2	1	30	70	100
BOA1107	English for profession	Ability Enhancement Course	2	0	0	2	30	70	100
VAC0001	Environment Education	Value Added Course	2	0	0	2	30	70	100
Total			20	0	04	22	270	630	900

SEMESTER: 2nd									
Course Code	Course Title	Type of Courses	L	T	P	No · of Cr ed its	Int.	Ext.	Total Marks
BOA2150	Surgical Equipment and Technology	Core Course Theory	3	0	0	3	30	70	100
BOA2151	General Microbiology	Minor Course	4	0	0	4	30	70	100
BOA2152	Computer Applications	Skill Enhancement Course	3	0	0	3	30	70	100
BOA2153	Nutrition	Multidisciplinary Course	3	0	0	3	30	70	100
BOA2154	Surgical Equipment and Technology Lab	Core Course Practical	0	0	2	1	30	70	100
BOA2155	Communication and Presentation Skills	Ability Enhancement Course	2	0	0	2	30	70	100
VAC0002	Human Values and Professional Ethics	Value Added Course	2	0	0	2	30	70	100
DISCIPLINE SPECIFIC ELECTIVE COURSE (Choose any one of them)									
BOA2156	Basic Anaesthesia Technology	Discipline Specific elective course	4	0	0	4	30	70	100
BOA2157	Social								

	Pharmacy								
Total			21	00	02	22	240	560	800

Programme learning outcomes: An Undergraduate Diploma is awarded to students who have demonstrated the achievement of the outcomes located at level 5:

Element of the Descriptor	Programme learning outcomes relating to Undergraduate Diploma
The graduates should be able to demonstrate the acquisition of:	
Knowledge and understanding	Graduates should be able to:
	Demonstrate comprehensive knowledge of surgical procedures, anesthesia administration, and patient monitoring.
	Understand human anatomy, physiology, pharmacology, and microbiology relevant to surgical and anesthesia care.
	Explain the principles of aseptic techniques, sterilization, and infection control.
	Describe the function and operation of anesthesia machines, ventilators, and surgical equipment
Skills required to perform and accomplish tasks	Apply legal, ethical, and regulatory frameworks in operation theater and anesthesia practices
	Graduates should be able to:
	Assist in preoperative, intraoperative, and postoperative patient care.
	Handle and maintain anesthesia equipment, surgical instruments, and monitoring devices.
	Monitor patients' vital signs and anesthesia depth under the supervision of anesthesiologists.
Application of knowledge and skills	Respond effectively to surgical emergencies and anesthesia-related complications.
	Maintain accurate documentation and records related to operation theater and anesthesia procedures.
	Graduates should be able to:
	Apply clinical and technical skills in real-world surgical and critical care settings.
	Assist anesthesiologists and surgeons in complex surgical procedures and emergency situations.
	Ensure patient safety and compliance with hospital protocols.
	Adapt to new technologies and innovations in anesthesia and surgical care.
	Integrate evidence-based practices and research findings into clinical work.

Generic learning outcomes	Graduates should be able to: Communicate effectively with surgeons, anesthesiologists, nurses, and patients.
	Work collaboratively in multidisciplinary healthcare teams. Demonstrate problem-solving and decision-making skills in high-pressure surgical environments.
	Exhibit time management, organizational, and critical-thinking abilities.
	Engage in lifelong learning and professional development to enhance clinical competencies
Constitutional, humanistic, ethical, and moral values	Graduates should be able to: Uphold professional ethics, patient confidentiality, and informed consent principles. Demonstrate compassion, empathy, and cultural sensitivity in patient care.
	Adhere to healthcare regulations, safety guidelines, and quality assurance protocols.
	Promote human rights, dignity, and ethical medical practices in clinical settings.
Employability and job-ready skills, and entrepreneurship skills and capabilities/qualities and mindset	Graduates should be able to: Secure employment in hospitals, surgical centers, intensive care units (ICUs), and emergency care settings.
	Develop leadership and management skills for supervisory roles in operation theater and anesthesia departments.
	Identify opportunities for freelance, private practice, or entrepreneurship in healthcare services. Stay updated with emerging trends, advanced technologies, and new treatment protocols in the medical field
Credit requirements	The successful completion of the 2 nd year (four semesters) of the undergraduate programme of 94 credit hours followed by an exit 4-credit of internship (Total 98 Credits)
Entry requirements	Passed UG Certificate course in the BSc. OT&AT with 44 credits hours followed by a 4-credit of internship. Or 3 years DOTT after metric Or Passes, 2 years DOTT after 10+2 with at least 45% in the aggregate.

SEMESTER: 3rd									
Course Code	Course Title	Type of Courses	L	T	P	No . of Credits	Int.	Ext.	Total Marks
BOA3200	General Anaesthesia	Core Course Theory	3	0	0	3	30	70	100
BOA3201	General Pharmacology	Minor Course	4	0	0	4	30	70	100
BOA3202	First Aid	Skill Enhancement Course	3	0	0	3	30	70	100
BOA3203	Disaster Management	Multidisciplinary Course	3	0	0	3	30	70	100
BOA3204	General Anaesthesia Lab	Core Course Practical	0	0	2	1	30	70	100
BOA3205	English for Clinical Language	Ability Enhancement Course	2	0	0	2	30	70	100
VAC0003	Hospital Infection Controls and Prevention techniques	Value Added Course	2	0	0	2	30	70	100
DISCIPLINE SPECIFIC ELECTIVE COURSE (Choose any one of them)									
BOA3206	Operation Threater Safety and Infection	Discipline Specific elective	4	0	0	4	30	70	100

BOA3207	Biochemistry	course							
Total			21	00	02	22	240	560	800

SEMESTER: 4th									
Course Code	Course Title	Type of Courses	L	T	P	No of Credits	Int.	Ext.	Total Marks
BOA4250	Principles of Anesthesia	Core Course Theory	3	0	0	3	30	70	100
BOA4251	Operation Theatre Technology	Core Course Theory	4	0	0	4	30	70	100
BOA4252	Surgical equipment & technology	Core Course Theory	3	0	0	3	30	70	100
BOA4253	Biochemistry & Pathology	Minor Course	4	0	0	4	30	70	100
BOA4254	Principles of Anesthesia Lab	Core Course Practical	0	0	2	1	30	70	100
BOA4255	Surgical equipment and Technology Lab	Core Course Practical	0	0	2	1	30	70	100
BOA4256	English for Research Writing	Ability Enhancement Course	2	0	0	2	30	70	100
BOA4257	Industrial Training	Internship	0	0	0	4	30	70	100
IKS0002	Indian Education	Value added course	2	0	0	2	30	70	100
DISCIPLINE SPECIFIC ELECTIVE COURSE (Choose any one of them)									
BOA4258	Obstetrics & Gynaecology	Discipline Specific elective	4	0	0	4	30	70	100
BOA4259	Basic Procedures								

	and Techniques	course							
Total			22	00	04	28	300	700	100 0

Programme learning outcomes: The Bachelor's degree is awarded to students who have demonstrated the achievement of the outcomes located at level 5.5:

Element of the Descriptor	Programme learning outcomes relating to Bachelor Degree
The graduates should be able to demonstrate the acquisition of:	
Knowledge and understanding	Graduates should be able to: Demonstrate in-depth knowledge of surgical procedures, anesthesia techniques, perioperative care, and critical care management. Understand human anatomy, physiology, pharmacology, microbiology, and pathophysiology related to anesthesia and surgery.
	Analyze the principles of anesthesia administration, patient monitoring, pain management, and post-anesthesia care.
	Apply infection control, sterilization, and aseptic techniques to maintain a safe surgical environment
	Explain legal, ethical, and regulatory frameworks in surgical and anesthesia practices.
General, technical and professional skills required to perform and accomplish tasks	Graduates should be able to: Assist in complex surgical procedures, anesthesia administration, and post-operative recovery management.
	Operate, calibrate, and maintain advanced anesthesia machines, ventilators, and patient monitoring systems.
	Monitor patients' vital signs, anesthesia effects, and pain levels to ensure patient safety.
	Implement quality assurance, patient safety protocols, and risk management strategies in clinical practice.
	Maintain detailed medical documentation, patient records, and surgical reports accurately.
Application of knowledge and skills	Graduates should be able to: Apply evidence-based clinical practices in operation theater and anesthesia care.
	Adapt to new medical technologies, surgical innovations, and anesthesia advancements
	Collaborate effectively with surgeons, anesthesiologists, nurses, and other healthcare professionals.
	Demonstrate leadership skills in coordinating operation theater activities and managing surgical teams.
	Conduct clinical research, audits, and quality

	improvement initiatives to enhance surgical outcomes
Generic learning outcomes	Graduates should be able to: Communicate effectively with patients, families, and healthcare teams in high-pressure environments. Exhibit critical thinking, problem-solving, and analytical skills in decision-making.
	Demonstrate time management, organizational, and multitasking abilities in surgical and anesthesia settings.
	Engage in lifelong learning and professional development to enhance career growth and expertise.
	Work effectively in interdisciplinary healthcare teams, ensuring seamless coordination in operation theaters
Constitutional, humanistic, ethical, and moral values	Graduates should be able to: Uphold medical ethics, patient confidentiality, and professional integrity in healthcare settings.
	Respect human dignity, diversity, and cultural sensitivity in patient care. Follow healthcare laws, policies, and international safety standards in surgical and anesthesia procedures.
	Advocate for patient rights, informed consent, and ethical medical decision-making.
Employability and job-ready skills, and entrepreneurship skills and capabilities/qualities and mindset	Graduates should be able to: Secure employment in hospitals, surgical centers, emergency care units, and intensive care units (ICUs). Take on supervisory, managerial, and leadership roles in operation theater and anesthesia departments
	Develop entrepreneurial skills for setting up private healthcare services, medical equipment supply, or training institutes.
	Stay updated with emerging healthcare trends, innovations, and global advancements in surgical and anesthesia technology
	Pursue higher education, specialized certifications, or research opportunities in anesthesia and surgical care.
Credit requirements	The successful completion of the 3rd year (six semesters) of the undergraduate programme of 148 credit hours followed by an exit 4-credit of internship (Total 152 Credits)
Entry requirements	Passed UG Diploma in the BSc. OTAT with 94 credits hours followed by a 4-credit of internship. (Total 98)

SEMESTER: 5 th									
Course Code	Course Title	Type of Courses	L	T	P	No of Credits	Int.	Ext.	Total Marks
BOA5300	Surgical Procedures	Core Course Theory	3	0	0	3	30	70	100
BOA5301	Anaesthesia for Specialty Surgeries I	Core Course Theory	3	0	0	3	30	70	100
BOA5302	Basics of Hospital Skills Learning	Core Course Theory	4	0	0	4	30	70	100
BOA5303	Research Methodology and Biostatistics	Minor Course	4	0	0	4	30	70	100
BOA5304	Surgical Procedures Lab	Core Course Practical	0	0	2	1	30	70	100
BOA5305	Anaesthesia for Specialty Surgeries I Lab	Core Course Practical	0	0	2	1	30	70	100
DISCIPLINE SPECIFIC ELECTIVE COURSE (Choose any one of them)									
BOA5306	Basic Intensive Care	Discipline Specific elective course	4	0	0	4	30	70	100
BOA5307	Medical Diseases Influencing Choice of Anesthesia								
DISCIPLINE SPECIFIC ELECTIVE COURSE (Choose any one of them)									
BOA5308	Regional Anaesthesia Techniques	Discipline Specific elective course	4	0	0	4	30	70	100
BOA5309	Medicine								

Total	22	00	04	24	240	560	800
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SEMESTER: 6 th									
Course Code	Course Title	Type of Courses	L	T	P	No of Credits	Int.	Ext.	Total Marks
BOA6350	CSSD Procedures	Core Course Theory	3	0	0	3	30	70	100
BOA6351	Anaesthesia for Specialty Surgeries II	Core Course Theory	3	0	0	3	30	70	100
BOA6352	Research publications and IPR	Minor Course	4	0	0	4	30	70	100
BOA6353	CSSD Procedures lab	Core Course Practical	0	0	2	1	30	70	100
BOA6354	Anaesthesia for Specialty Surgeries IILab	Core Course Practical	0	0	2	1	30	70	100
BOA6355	Industrial Training	Internship	0	0	0	4	30	70	100
IKS0006	Indian Health science	Value added course	2	0	0	2	30	70	100
DISCIPLINE SPECIFIC ELECTIVE COURSE (Choose any one of them)									
BOA6356	Critical Care Equipment & Procedures in ICU	Discipline Specific elective course	4	0	0	4	30	70	100
BOA6357	Hematology & Blood Bank								
DISCIPLINE SPECIFIC ELECTIVE COURSE (Choose any one of them)									
BOA6358	Advanced Cardiac Catheterization	Discipline Specific	4	0	0	4	30	70	100

BOA6359	Health Care	elective course							
Total			20	00	04	26	270	630	900

Programme learning outcomes: The Bachelor's degree (with Research) or the Post-Graduate Diploma is awarded to students who have demonstrated the achievement of the outcomes located at level 6:

Element of the Descriptor	Programme learning outcomes relating to Bachelor Degree (with Research)
The graduates should be able to demonstrate the acquisition of:	
Knowledge and understanding	Graduates should be able to: Demonstrate advanced theoretical and practical knowledge of operation theater procedures, anesthesia administration, and critical care management.
	Analyze the pharmacodynamics and pharmacokinetics of anesthetic drugs, their interactions, and patient-specific considerations.
	Evaluate the principles of advanced anesthesia techniques, pain management, and perioperative care.
	Apply biomedical science, technology, and clinical research to enhance surgical and anesthesia outcomes.
	Understand healthcare policies, regulations, and global standards in surgical and anesthesia care.
General, technical and professional skills required to perform and accomplish tasks	Graduates should be able to: Assist in high-risk and specialized surgical procedures, including cardiac, neuro, and transplant surgeries.
	Operate and troubleshoot sophisticated anesthesia machines, ventilators, and patient monitoring systems.
	Monitor and assess complex anesthesia-induced physiological changes and postoperative recovery outcomes.
	Lead operation theater teams, ensuring efficient workflow, patient safety, and emergency preparedness.
	Utilize data-driven decision-making, artificial intelligence, and digital health technologies in anesthesia care
	Conduct independent and collaborative research studies to develop innovative solutions in perioperative medicine.
Application of knowledge and skills	Graduates should be able to: Apply evidence-based research and clinical findings to enhance anesthesia and surgical care.
	Adapt to emerging healthcare trends, robotic-assisted surgeries, and advanced anesthetic techniques
	Present research findings in scientific conferences, publications, and interdisciplinary collaborations.
Generic	Graduates should be able to:

learning outcomes	Communicate research findings effectively through scientific writing, presentations, and publications.
	Demonstrate critical thinking, analytical reasoning, and complex problem-solving in anesthesia care.
	Collaborate with medical researchers, anesthesiologists, and surgical teams for interdisciplinary healthcare solutions.
	Exhibit strong leadership, organizational, and mentoring skills in academic and clinical settings.
Constitutional, humanistic, ethical, and moral values	Graduates should be able to: Uphold medical ethics, patient rights, and legal responsibilities in healthcare practice.
	Promote equitable and patient-centered care, considering diverse socio-cultural and economic backgrounds.
	Follow global best practices in anesthesia safety, infection control, and patient confidentiality.
Employability and job-ready skills, and entrepreneurialship skills and capabilities/qualities and mindset	Graduates should be able to: Qualify for senior roles in operation theater and anesthesia management, research, and academic institutions.
	Develop entrepreneurial ventures in medical technology, anesthesia services, and healthcare startups
	Lead clinical trials, hospital-based research projects, and healthcare innovations in perioperative medicine.
	Engage in policy-making and healthcare administration to improve surgical and anesthesia care systems. Pursue higher education (M.Sc., Ph.D., or medical specializations) or professional certifications in anesthesia and surgical sciences.
Credit requirements	The successful completion of the 4 th year (eight semesters) of the undergraduate programme of 196 credit hours.
Entry requirements	Bachelor's Degree with 148 credits hours followed by a 4-credit of internship. After completing the requirement of a 3 years bachelor's degree, candidates who meet a minimum 75% marks or its equivalent grade will be allowed to continue studies in the 4 th year of the Under Graduate programme leading to the Bachelor's Degree with Research.

*The 7th and 8th semester of the Bachelor of Science in Operation Theater & Anesthesia Technology program focuses on preparing students for

professional practice through internships and research work. This semester is crucial as it marks the transition from academic learning to practical application in real-world settings.

Internship and Research Overview:

- During the 7th & 8th semester, Operation Theater & Anesthesia Technology students engage in both internship and research activities. This period provides students with the opportunity to apply their academic knowledge in clinical settings, interact with patients, and gain hands-on experience. In parallel, students are expected to undertake a research project, contributing to the body of knowledge in the field of Operation Theatre and Anesthesia technology.
- In 7th semester the student will present 1 seminar and submit 1 case study in the course Self Development Report which would be related to his/her topic of research and submission of Synopsis proceed to 8th sem. Dissertation phase I will include Synopsis approval from Doctoral Advisory Committee (DAC) will be taken by the student and after that it will send to Institutional Research Committee (IRC), followed by Institutional Ethical Committee (IEC) for approval.
- In 8th semester as a part of dissertation phase II, dissertation will be evaluated for **300 marks** on the parameter laid down in the Performa for the evaluation in which the students will give a presentation on the dissertation and an open viva-exam examination will be conducted by the external examiner. Student will submit three hard copies of her/his dissertation along with soft copy as PDF file to the Department and 1 Review & Research paper based on his/her research work.
- The Anti-plagiarism policy of the university is to be strictly followed by the candidate and the supervisor.

SEMESTER: 7th									
Course Code	Course Title	Type of Course	L	T	P	C	Int.	Ext.	Total Marks
BOA7400	Internship (Six months)	Skill Based	0	0	0	8	30	70	100
BOA7401	Dissertation (Phase I)	Skill Based	0	0	0	12	30	70	100
BOA7402	Seminar	Skill Based	0	0	8	4	30	70	100
BOA7403	Self- Development Report	Ability Enhancement Course	0	0	4	2	30	70	100
Total			0	0	4	26	120	280	400

Dissertation (Phase) I will include Synopsis approval from Doctoral Advisory Committee (DAC) will be taken by the student and after that it will send to Institutional Research Committee (IRC), followed by Institutional Ethical Committee (IEC) for final approval.

Self-Development Report will include submission of one case study

SEMESTER: 8th									
Course Code	Course Title	Type of Course	L	T	P	C	Int.	Ext.	Total Marks
BOA8450	Internship (Six months)	Skill Based	0	0	0	8	30	70	100
BOA8451	Dissertation (Phase II)	Skill Based	0	0	0	12	30	70	100
BOA8452	Self- Development Report	Ability Enhancement Course	0	0	4	2	30	70	100
Total			0	0	4	22	90	210	300
Grand Total			126	0	30	192	1670	2930	4600

Self-Development Report- Student will present progress report of research work in the third month of 8th semester.

Dissertation (Phase) II - Dissertation will be evaluated for **300 marks** on the parameter laid down in the proforma for the evaluation in which the students will give a presentation on the dissertation and an open viva-exam examination will be conducted by the external examiner. Student will submit three hard copies of her/his dissertation along with soft copy as PDF file to the Department and 1 Review & Research paper based on his/her research work.

1ST SEMESTER

Course Title: General Anatomy	L	T	P	C
Course Code: BOA1100	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Learn about the various muscles, organs, bones, joints, tendons, ligaments, blood vessels and cells.
2. Identify cell organelles, blood component, function, skeletal system, circulatory system, lymphatic system and its structure.
3. Recognize the properties of nerve fiber, anatomy of neuralgia, synapse, CNS, CSF, brain, cranial nerves, demonstration of reflexes.
4. Enlist the malfunctioning of the organs and diagnose the disorders
5. Identify and describe the major anatomical structures of the human body.

Course Contents**UNIT-I****10 Hours**

Introduction to Human Anatomy: General organization Synopsis of all systems Cell Organization: Structure & function of all cell organelles-cell division (Mitosis and meiosis) Tissues (Definition, classification with structure and function). Tissues of the Body: Epithelium, connective tissue, bone and cartilage, Muscles: Different types of muscles, their functional differentiation, their relationship with different structures, their neural supply

UNIT-II**10 Hours**

Cardiovascular and Respiratory Systems, Anatomy of the heart and circulatory system. Blood vessels: Differentiation between arteries and veins, embryology, histology of both arteries and veins, Functional differences between the two, anatomical differences at different locations. Lymphatic system: Embryology, functions, relationship with blood vessels and organs. Skin and appendages: Embryology, anatomical differences in different areas, functional and protective variations, innervations, relationship with muscles and nerves.

UNIT-III**10 Hours**

Digestive system: oral cavity, oesophagus, stomach, intestines, and accessory organs (liver, gallbladder, and pancreas). Urinary system: kidneys, ureters, bladder, and urethra. Male reproductive system: anatomy of the testes, epididymis, vas deferens, prostate gland, and penis. Female reproductive system: anatomy and physiology of the ovaries, fallopian tubes, uterus, vagina, and breasts, Development and growth of the reproductive system.

UNIT-IV**15 Hours**

Glands: Embryology, different types of glands (exocrine and endocrine), functional, differences, neural control of glands. Nervous system: Parts of Nervous system, cell types of nervous system, Blood-brain barrier, Reflex arc, Peripheral Nerves, Spinal nerves, Nerve fibres, Autonomic Nervous system. Brain and Cranial nerves: Major parts of Brain, Protective coverings of the Brain, Cerebrospinal Fluid, Brain stem, Cerebellum, Diencephalon, Cerebrum, Cranial nerves.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- Moore, K. L., Dalley, A. F., & Agur, A. M. R. (2018). *Clinically Oriented Anatomy* (8th ed.). Wolters Kluwer.
- Drake, R. L., Vogl, W., & Mitchell, A. W. M. (2014). *Gray's anatomy for students*. Elsevier Health Sciences.
- Standring, S. (Ed.). (2016). *Gray's anatomy: The anatomical basis of clinical practice*. Elsevier Health Sciences.
- Moore, K. L., & Dalley, A. F. (2018). *Clinically oriented anatomy*. Wolters Kluwer.
- Netter, F. H. (2019). *Atlas of human anatomy*. Elsevier Health Sciences.
- Snell, R. S. (2014). *Clinical anatomy by systems*. Lippincott Williams & Wilkins.
- Tank, P. W. (2015). *Grant's dissector*. Wolters Kluwer.
- Moore, K. L., Dalley, A. F., & Agur, A. M. (2018). *Essential clinical anatomy*. Wolters Kluwer.

- *Rohen, J. W., Yokochi, C., &Lütjen-Drecoll, E. (2019). Color atlas of anatomy: A photographic study of the human body. Lippincott Williams & Wilkins.*

Course Title: General Physiology	L	T	P	C
Course Code: BOA1101	3	0	0	3

Total Hours: 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Acquire the knowledge of the relative contribution of each organ system in maintenance of the Milieu Interior (Homeostasis)
2. Compare & contrast Functions of lipids, carbohydrates, proteins & cell organelles.
3. Classify Physiological functions of various systems, with special reference to Musculoskeletal, Neuro-motor, Cardio-respiratory, Endocrine, Uro- genital function, & alterations in function with aging
4. Conclude Properties of nerve fibers, function of neuroglia, synapse, CNS, CSF, brain, cranial nerves, demonstration of reflexes.
5. Explain the structure and function of cell membranes, organelles, and transport mechanisms.

Course Contents

UNIT-I

15 Hours

Cell structure & organization: Tissue organization, Epithelium, Connective tissue, Collagen fibres, Elastic fibres, Areolar fibres, Cartilage, Bone Contractile tissue, striated, skeletal, cardiac, non-striated, plain – myoepithelial, General principles of cell physiology, Physiology of skeletal muscle. Blood: Composition, Volume measurement & variations, Plasma proteins –classification & functions, red blood cells –development, morphology & measurements –functions & dysfunctions. White blood cells – development –classification, morphology –functions & dysfunctions Platelets –morphology –development, functions & dysfunctions. Clotting –factors – mechanism –anti- coagulants dysfunctions. Blood grouping –classification – importance in transfusion, Rh factor & incompatibility. Suspension stability, Osmotic stability, Reticulo endothelial system, Spleen, lymphatic tissue, Thymus, bone marrow, immune system, cellular, Humoral, Autoimmune

UNIT-II

10 Hours

Digestion: General arrangement, Salivary digestion –functions & regulations, Gastric digestion –functions & regulations, Pancreatic digestion –functions & regulations, Intestinal digestion –functions & regulations, Liver & bile-Absorption, Motility, Deglutition, Vomiting, Defecation, Functions of large intestine, Neurohumoral regulations of alimentary functions. Excretion:

Body fluids –distribution, measurement & exchange, Kidney –structure of nephron –mechanism of urine formation –composition of the urine and abnormal constituents –urinary bladder & micturition. Muscular system: types of muscles, muscle contraction, and energy metabolism, Motor units and neuromuscular junctions. Control of movement: spinal reflexes, voluntary movement, and motor pathways, Energy metabolism during exercise and physical activity. Reproduction: Male reproductive system: spermatogenesis, hormonal control, and fertility.

UNIT-III

10 Hours

Female reproductive system: oogenesis, menstrual cycle, pregnancy, and lactation, Hormonal control of reproductive functions. Respiration: Mechanics of respiration –pulmonary function tests –transport of respiratory gases neural and chemical regulation of respiration –hypoxia, cyanosis, dyspnoea– asphyxia. Circulation: General principles Heart: myocardium – innervation –transmission of cardiac impulse- Events during cardiac cycle – cardiac output. Peripheral circulation: peripheral resistances –arterial blood pressure –measurements –factors regulation variations –capillary circulation – venous circulation. Special circulation: coronary cerebral –miscellaneous. Environmental physiology: Body temperature regulation (including skin Physiology). Exposure to low and high atmospheric pressure

UNIT-IV

10 Hours

Structure and function of neurons and glial cells, Nervous system organization: central nervous system (CNS) and peripheral nervous system (PNS), Action potentials and nerve impulse transmission, Synaptic transmission: neurotransmitters and synaptic integration. Structure and function of the major endocrine glands, Hormones and their regulation of physiological processes, Neural control vs. endocrine control of body functions. Special senses –(Elementary) Olfaction –Taste –Hearing.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- Guyton, A. C., & Hall, J. E. (2016). *Textbook of Medical Physiology* (13th ed.). Saunders.
- Boron, W. F., & Boulpaep, E. L. (2016). *Medical Physiology* (3rd ed.). Saunders.
- Widmaier, E. P., Raff, H., & Strang, K. T. (2014). *Vander's Human Physiology: The Mechanisms of Body Function* (13th ed.). McGraw-Hill Education.
- Sherwood, L. (2015). *Human Physiology: From Cells to Systems* (9th ed.). Cengage Learning.
- Silverthorn, D. U. (2018). *Human Physiology: An Integrated Approach* (8th ed.). Pearson.

Course Title: Introduction to OT	L	T	P	C
Course Code: BOA1102	4	0	0	4

Total Hours 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Define occupational therapy and describe its role in healthcare and community settings.
2. Explain the history and evolution of occupational therapy as a profession.
3. Observe and analyze human occupations in different contexts.
4. Develop an understanding of ethical considerations in OT practice.
5. Demonstrate awareness of professional behavior and responsibilities in occupational therapy.

Course Contents

UNIT-I

15 Hours

Theatre Organization

- Members of Surgical Team & Their Job Responsibilities • Recommendation of Indian Society of Anesthesiologists • Operating Department – Access Zones • Construction of Operating Room • Operation Theatre Discipline & Asepsis Methods • Theatre Sterilization Schedule & Various Methods, • Types Equipment's In The Operating Room • Maintenance of Drugs-Protocol •Cssd (Method Of Ccssd Functioning- Cleaning & Packing Of Surgical Instruments, sterilization methods, Handling autoclaves, E.T.O sterilization.
- OT STORES – indenting, storekeeping, accounting and auditing

UNIT-II

15 Hours

- Infection Control • Care of skin • Hand hygiene • Protective apparel • Procedure for safe handling of sharps • Procedure for safe disposal of sharps • Management of blood and body fluid spills • Linen management (use & disposal) • PPE - Hand washing – Gloves - Masks, goggles & facemasks • Environmental cleaning • Hospital acquired infections • Management of Sharps • Universal precautions & occupational safety.

UNIT-III**15 Hours**

Biomedical Waste, fire & safety management • Separate waste streams - Sharp wastes - Infectious non sharp wastes - General waste- Recyclable items, Color coding • BMW Management Committee- Structure & Composition – functions • Steps - Segregation - Collection – Transportation-Disposal • Documentation - Application for authorization • prevention of fire and electric hazards inside the operating complex.

UNIT-IV**15 Hours**

Patient and staff safety, Communicating Effectively, involving patients as partners in healthcare, do 's& Don 'ts of Communication, Obtaining Consent, Being culturally respectful & knowledgeable, Adverse events & near misses, Introduction & explanation to the terms Adverse event form 3. Working Safely, being a team player, understanding human factors, Providing continuity of care, Medication safety, Wrong site, Wrong patient, Wrong technique, Wrong dose, Wrong Medicine

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *Berry & Kohn's Operating Room Technique* – Nancymarie Phillips.
- *Fundamentals of Operating Department Practice* – Daniel Rodger.
- *Hospital Infection Control Guidelines* – Apurba S. Sastry & Sandhya Bhat.
- *Medical Ethics and Legal Issues in Surgery* – P. D. Warrick

Course Title: Introduction to quality and Patient Safety	L	T	P	Cr.
Course Code: BOA1103	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. To understand the basics of emergency care and life support skills and to Manage an emergency including moving a patient
2. To help prevent harm to workers, property, the environment and the general public.
3. To provide a broad understanding of the core subject areas of infection prevention and control.
4. To provide knowledge on the principles of on-site disaster management.
5. To maintain the quality in patient care.

Course Content

UNIT I

10 Hours

Quality assurance and management – Concepts of Quality of Care, Quality Improvement Approaches, Standards and Norms, Introduction to NABH guidelines. Basics of emergency care and life support skills - Basic life support (BLS), Vital signs and primary assessment, Basic emergency care – first aid and triage, Ventilations including use of bag-valve-masks (BVMs), Choking, rescue breathing methods, One and Two-rescuer CPR

UNIT II

10 Hours

Bio medical waste management and environment safety -Definition of Biomedical Waste, Waste minimization, BMW – Segregation, collection, transportation, treatment and disposal (including color coding), Liquid BMW, Radioactive waste, Metals/ Chemicals / Drug waste, BMW Management & methods of disinfection, Modern technology for handling BMW, Use of Personal protective equipment (PPE), Monitoring & controlling of cross infection (Protective devices)

UNIT III**12 Hours**

Infection prevention and control - Evidence-based infection control principles and practices [such as sterilization, disinfection, effective hand hygiene and use of Personal protective equipment (PPE)], Prevention & control of common healthcare associated infections, Components of an effective infection control program, Guidelines (NABH and JCI) for Hospital Infection Control

UNIT IV**13 Hours**

Antibiotic Resistance - History of Antibiotics, How Resistance Happens and Spreads, Types of resistance- Intrinsic, Acquired, Passive, Trends in Drug Resistance, Actions to Fight Resistance, Bacterial persistence, Antibiotic sensitivity, Consequences of antibiotic resistance

Disaster preparedness and management - Fundamentals of emergency management, psychological impact management, Resource management, Preparedness and risk reduction, information management, incident command and institutional mechanisms.

Transactional Mode: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Reading:

- *Washington Manual of Patient Safety and Quality Improvement Paperback – 2016 by Fondahn (Author)*
- *Understanding Patient Safety, Second Edition by Robert Wachter (Author)*
- *Handbook of Healthcare Quality & Patient Safety Author : Girdhar J Gyani, Alexander Thomas*
- *Researching Patient Safety and Quality in Healthcare: A Nordic Perspective Karina Aase, Lene Schibevaag*
- *Old) Handbook Of Healthcare Quality & Patient Safety by Gyani Girdhar J (Author)*
- *Handbook of Healthcare Quality & Patient Safety by .Gyani G J/Thomas A*

Course Title: Human Rights and Duties	L	T	P	Cr.
Course Code: BOA1104	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Identify and respect the ethical principles related to patient confidentiality and informed consent.
2. Demonstrate awareness of legal frameworks governing medical laboratory practice and blood banking.
3. Recognize and uphold the fundamental human rights of all individuals, regardless of background.
4. Apply principles of non-discrimination and equality in healthcare delivery.
5. Understand and fulfill the professional duties and responsibilities associated with medical laboratory technology.

Course Content

UNIT-I

15 Hours

Introduction to Human Rights, Definition and historical evolution of human rights, Universal Declaration of Human Rights (UDHR) and its significance, Cultural relativism vs. universalism in human rights discourse, Theories of natural law, social contract, and human dignity, Debates on the universality and cultural specificity of human rights, Relationship between rights and moral duties.

UNIT-II

10 Hours

International human rights law: treaties, conventions, and customary law, Regional human rights systems (e.g., European Convention on Human Rights, African Charter on Human and Peoples' Rights), National constitutions and domestic protection of human rights, right to life, liberty, and security, Freedom of expression, assembly, and association, right to a fair trial and due process.

UNIT-III

10 Hours

Right to education, healthcare, and social security, right to work, just and favorable conditions of work, and adequate standard of living, Challenges in

realizing economic and social rights, Rights of indigenous peoples, Rights of minorities and marginalized groups, Intersectionality and multiple forms of discrimination.

UNIT-IV

10 Hours

Human rights violations in armed conflicts and humanitarian crises, Gender equality and women's rights, Rights of refugees, migrants, and stateless persons, Strategies for promoting and defending human rights, Role of civil society organizations, NGOs, and grassroots movements, Ethical dilemmas and challenges in human rights advocacy

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *"The Idea of Human Rights" by Charles R. Beitz*
- *"Just and Unjust Wars" by Michael Walzer*
- *"The Ethics of Authenticity" by Charles Taylor*
- *"Global Justice: A Cosmopolitan Account" by Gillian Brock*

Course Title: General Anatomy Lab	L	T	P	C
Course Code: BOA1105	0	0	2	1

Total Hours 30 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of various structures in the human body.
2. Identify the microscopic structures of various tissues, and organs in the human body and correlate the structure with the functions.
3. Comprehend the basic structure and connections between the various parts of the central nervous system so as to analyse the integrative and regulative functions on the organs and systems.
4. Use appropriate anatomical terminology to communicate with peers and healthcare professionals.
5. Analyze case studies to determine the anatomical basis of disease presentations.

Course Contents

List of Practical's / Experiments:

30 Hours

- 1) Demonstrate the identification of major bones in the human body.
- 2) Demonstrate the range of motion and movement types at various joints in the body.
- 3) Demonstrate the location and function of major muscles in the body.
- 4) Demonstrate the anatomy and structure of vital organs such as the heart, lungs, liver, kidneys, and intestines.
- 5) Demonstrate the central and peripheral components of the nervous system.
- 6) Discuss the characteristics and functions of epithelial, connective, muscular, and nervous tissues.
- 7) Demonstrate the identification of surface anatomical landmarks on the body.
- 8) Demonstrate the stages of human embryonic development using models or visual aids.
- 9) Provide clinical case studies or examples to demonstrate the application of anatomical knowledge in diagnosing and understanding medical conditions.

Course Title: General Physiology (Lab)	L	T	P	C
Course Code: BOA1106	0	0	2	1

Total Hours 30 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Explain the normal functioning of various organ systems of the body and their interactions.
2. Elucidate the physiological aspects of normal growth and development.
3. Describe the physiological response and adaptations to environmental stresses.
4. Know the physiological principles underlying pathogenesis of disease.
5. Identify different tissue types and their roles in physiological functions.

Course Contents

List of Practical's / Experiments:

30 Hours

- 1) Measure blood pressure using a sphygmomanometer and stethoscope.
- 2) Perform an ECG recording to measure the electrical activity of the heart.
- 3) Measure lung volumes and capacities using a spirometer
- 4) Record and interpret brain waves using an EEG machine.
- 5) Measure muscle strength and fatigue using a handgrip dynamometer or a grip strength measurement device.
- 6) Measure nerve conduction velocity using surface electrodes and a stimulator
- 7) Perform blood typing tests to determine ABO and Rh blood groups.
- 8) Use colorimetric or electrochemical methods to measure electrolyte concentrations (such as sodium, potassium, and calcium) in blood or urine samples.
- 9) Calculate basal metabolic rate (BMR) using indirect calorimetry, which measures oxygen consumption and carbon dioxide production.
- 10) Perform urine analysis tests to measure parameters such as pH, specific gravity, protein, glucose, and presence of other substances.

Course Title: English for profession	L	T	P	Cr.
Course Code: BOA1107	2	0	0	2

Total Hours 30 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Demonstrate effective patient communication.
2. Produce clear and concise medical documentation.
3. Interpret and analyze medical texts and research.
4. Participate confidently in professional discussions and presentations.
5. Students will be able to understand and use professional vocabulary and terminology relevant to their chosen field, including industry-specific jargon.

Course Contents

UNIT I

7 Hours

Etiquette – Telephone, Table (Different ways of enhancing oneself)

1. Parts of Speech Tens Vocabulary.
2. Synonyms.
3. Antonyms.
4. One word substitute.
5. Homophones.
6. Homonyms.

UNIT II

7 Hours

Composition

1. Orientation to different types of letters – (Social, business letter, applying for a job, for higher studies, preparing curriculum vitae, subscribing to a journal, letters to the Editor).
2. Essay writing – Descriptive, Narrative and Reflective.
3. Précis or Summary writing
4. Report writing (with special stress on scientific/technical reports, preparing field/observation report).

UNIT III

7 Hours

Practical/ Spoken English

- Front Desk management, fixing appointments, getting information – Managing medical representatives, able to answer FAQs, lab reports writing, telephoning in a hospital: the object is to practice fluent conversation

1. JAM session.
2. Conversation.
3. Group discussion.
4. Role-plays.
5. Conversation. Group discussion.
6. Presentation.
7. Role plays.

UNIT IV

9 Hours

Grammar

1. Narration.
2. Voice change (Use of passive voice particularly in scientific and official writing).
3. Use of articles and preposition.
4. Figures of speech.
5. Vocabulary
 - The language of Doctor and Patient.
 - General description and medical description.
 - Medical terminology – roots.
 - Prefixes and suffixes.
 - Medical abbreviations.
6. Punctuation.
7. Common errors in English

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- Loveleen Kaur, 'Communication Skills' Satya Prakashan Publication.
- Narinder Kumar Bodhraj, 'Business Communication', Kalyani Publishers, 2011.
- S.P. Dhanavel, 'English & communication Skills for the Students of Science & Engineering' Orient blackswan publication, 2009.
- Indrajit Bhattacharya, 'An Approach to Communication Skills'.
- Chissie Wright, 'Handbook of Practical Communication Skills

Course Title: Environment Education	L	T	P	Cr.
Course Code: VAC0001	2	0	0	2

Total Hours 30 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Grasp the concept of Environmental Science, its components, types of natural resources, their distribution, and usage, with a focus on India.
2. Discuss the factors impacting biodiversity loss and ecosystem degradation in India and the world.
3. An overview of Contemporary Environmental Issues i.e National and Global efforts to address climate change adaptation and mitigation.
4. To understand environmental laws for monitoring pollution.
5. Principles guiding human responsibility toward the environment.

Course Content

Unit-I

6 Hours

The man-environment interaction: Humans as hunter-gatherers; Mastery of fire; Origin of agriculture; Emergence of city-states; Great ancient civilizations and the environment, Indic Knowledge and Culture of sustainability; Middle Ages and Renaissance; Industrial revolution and its impact on the environment; Population growth and natural resource exploitation; Global environmental change. Environmental Ethics and emergence of environmentalism: Anthropocentric and eco-centric perspectives (Major thinkers); The Club of Rome- Limits to Growth; UN Conference on Human Environment 1972; World Commission on Environment and Development and Rio Summit. Natural resources: Definition and Classification. Microbes as a resource; Status and challenges. Environmental impact of over-exploitation, issues and challenges; Water scarcity and Conflicts over water. Mineral resources and their exploitation; Environmental problems due to extraction of minerals and use; Soil as a resource and its degradation. Energy resources: Sources and their classification. Implications of energy use on the environment. Introduction to sustainable development: Sustainable Development Goals (SDGs)- targets and indicators, challenges and strategies for SDGs.

Unit-II**6 Hours**

Biodiversity as a natural resource; Levels and types. Biodiversity in India and the world; Biodiversity hotspots; Species and ecosystem threat categories. Major ecosystem types in India, their services, classification, significance and characteristics of forests, wetlands, grasslands, agriculture, coastal and marine; Threats to biodiversity and ecosystems: Land use and land cover change; Commercial exploitation of species; Invasive species; Fire, disasters and climate change. Major conservation policies: in-situ and ex-situ approaches; National and International Instruments for biodiversity conservation; the role of traditional knowledge, community-based conservation; Gender and conservation. Environmental issues and scales: micro-, meso-, synoptic and planetary scales; Temporal and spatial extents of local, regional, and global phenomena. Pollution: Types of Pollution- air, noise, water, soil, thermal, radioactive; municipal solid waste, hazardous waste; transboundary air pollution; acid rain; smog. Land use and Land cover change: land degradation, deforestation, desertification, urbanization. Biodiversity loss: past and current trends, impact. Global change: Ozone layer depletion; Natural Disasters – Natural and Man-made (Anthropogenic).

Unit-III**8 Hours**

Definition of pollution; Point and non-point sources. Air pollution: sources, Impacts, Primary and Secondary pollutants; Criteria pollutants- carbon monoxide, lead, nitrogen oxides, ground-level ozone, particulate matter and sulphur dioxide; Other important air pollutants- Volatile Organic compounds (VOCs), Peroxyacetyl Nitrate (PAN), Polycyclic aromatic hydrocarbons (PAHs) and Persistent organic pollutants (POPs); Indoor air pollution; National Ambient Air Quality Standards. Water pollution: Sources; River, lake and marine pollution, groundwater pollution, impacts; Water quality parameters and standards. Soil pollution: sources and pollutants. Solid and hazardous waste, its impacts. Noise pollution: Definition, Unit of measurement, sources, noise standards; adverse impacts. Thermal and Radioactive pollution: Sources and impacts. Climate change: natural variations in climate due to greenhouse gas emission- past, present & future. Structure of atmosphere. Projections of global climate change with special reference to temperature, rainfall, climate variability and extreme events; Importance of 1.5 °C and 2.0 °C limits to global warming; Climate change projections for the Indian sub-continent. Impacts, vulnerability and adaptation to climate change: Observed impacts of climate change on ocean and land systems; Sea level rise, changes in marine and coastal ecosystems; Impacts on forests, natural ecosystems, animal species, agriculture, health,

urban infrastructure; the concept of vulnerability and its assessment; Adaptation vs. resilience; Climate-resilient development; Indigenous knowledge for adaptation to climate change. Mitigation of climate change: Synergies between adaptation and mitigation measures; Green House Gas (GHG) reduction vs. sink enhancement; Concept of carbon intensity, energy intensity and carbon neutrality; National and international policy instruments for mitigation, decarbonizing pathways and net zero targets for the future; Energy efficiency measures; Carbon capture and storage, National climate action plan and Intended Nationally Determined Contributions (INDCs); Climate justice.

Unit-IV

10 Hours

Introduction to environmental laws and regulation: Article 48A, Article 51A (g) and other environmental rights; Introduction to environmental legislations on the forest, wildlife and pollution control. Environmental management system: ISO 14001 Concept of Circular Economy, Life cycle analysis; Cost-benefit analysis Environmental audit and impact assessment; Environmental risk assessment Pollution control and management; Waste Management- Concept of 3R (Reduce, Recycle and Reuse) and sustainability; Ecolabeling /Ecomark scheme. Bilateral and multilateral agreements on international co-operation of instruments; conventions and protocols; binding and nonbinding measures; Conference of the Parties (COP) Major International Environmental Agreements:- Convention on Biological Diversity (CBD); Cartagena Protocol on Biosafety; Nagoya Protocol on Access and Benefit-sharing; Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES); Ramsar Convention on Wetlands of International Importance; United Nations Convention to Combat Desertification (UNCCD); Vienna Convention for the Protection of the Ozone Layer; Montreal Protocol on Substances that Deplete the Ozone Layer and the Kigali Amendment; Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal; Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade; Stockholm Convention, Minamata Convention, United Nations Framework Convention on Climate Change (UNFCCC); Kyoto Protocol; Paris Agreement; India's status as a party to major conventions Major Indian Environmental Legislations: The Wild Life (Protection) Act, 1972; The Water (Prevention and Control of Pollution) Act, 1974; The Forest (Conservation) Act, 1980; The Air (Prevention and Control of Pollution) Act, 1981; The Environment (Protection) Act, 1986; The Biological Diversity Act, 2002; The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006; Noise Pollution

(Regulation and Control) Rules, 2000; Industry-specific environmental standards; Waste management rules; Ramsar sites; Biosphere reserves; Protected Areas; Ecologically Sensitive Areas; Coastal Regulation Zone; Production and consumption of Ozone Depleting substances, Green Tribunal; Some landmark Supreme Court judgements Major International organisations and initiatives: United Nations Environment Programme (UNEP), International Union for Conservation of Nature (IUCN), World Commission on Environment and Development (WCED), United Nations Educational, Scientific and Cultural Organization (UNESCO), Intergovernmental Panel on Climate Change (IPCC), and Man and the Biosphere (MAB) programme.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Readings: -

- Chahal, M. K. (2024). *Environmental Science and Hazards Management (Ecology and Risk Management)*, ISBN:978-93-6440-586-7.
- Baskar, S. and Baskar, R. (2009). *Natural Disasters (Earth's Processes & Geological Hazards)*, ISBN: 978-81-7806-168-9.
- Tiefenbacher, J (ed.) (2022), *Environmental Management - Pollution, Habitat, Ecology, and Sustainability*, Intech Open, London. 10.5772/
- Kanchi Kohli and Manju Menon (2021) *Development of Environment Laws in India*, Cambridge University Press.
- Bhagwat, Shonil (Editor) (2018) *Conservation and Development in India: Reimagining Wilderness*, Earthscan Conservation and Development, Routledge.
- Manahan, S.E. (2022). *Environmental Chemistry (11th ed.)*. CRC Press. <https://doi.org/10.1201/9781003096238>.
- William P. Cunningham and Mary A. (2015) *Cunningham Environmental Science: A Global Concern*, Publisher (Mc-Graw Hill, USA)
- Central Pollution Control Board Web page for various pollution standards. <https://cpcb.nic.in/standards/>
- Theodore, M. K. and Theodore, Louis (2021) *Introduction to Environmental Management*, 2nd Edition. CRC Press.
- Ministry of Environment, Forest and Climate Change (2019) *A Handbook on International Environment Conventions & Programmes*. <https://moef.gov.in/wp-content/uploads/2020/02/convention-V-16-CURVE-web.pdf>

SEMESTER 2nd

Course Title: Surgical equipment and technology	L	T	P	C
Course Code: BOA2150	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Identify and describe basic and advanced surgical instruments (scalpels, forceps, retractors, clamps, scissors, etc).
2. Explain the classification of surgical instruments (cutting, grasping, retracting, suturing, etc.).
3. Understand the material composition and sterilization requirements of surgical instruments.
4. Understand the types and uses of electrosurgical units (ESU) and safety measures.
5. Describe the function of suction machines, tourniquets, and surgical microscopes.

Course Contents**UNIT-I****10 Hours**

Physics related to anaesthesia equipments • Care & maintenance of OT equipments - Handling, cleaning and carbolicisation of operation tables, operation theatres lights, suction machines, diathermy and other OT Equipments. - Maintenance of special surgical equipment their care and preservation. - Techniques of handling of laser based equipments, their care preservation and maintenance. - Ventilation of operation theater air conditioning and control of pollution.

UNIT-II**10 Hours**

Recovery Room and Nursing Care – Pre-operative preparation of patient. – Transportation techniques of patient in conscious, semiconscious and unconscious state, to and from Operation Theatre. – Management of Pre-operative and post-operative rooms. – Resuscitation Techniques along with the management of equipments and drugs.

UNIT-III**15 Hours**

Patient Handling and shifting techniques • Operating Room Ethics, Discipline, Layout, Equipments – Moral aspects and duties of Medical Technologies. – Indenting, Book Keeping and Storage procedures of different articles. – Co-ordination with all working personal in operation theatre. – Psychological aspects of patient staff and relatives of the patient. – Management of operations theatre in routine and emergency. – Theatre etiquettes. • Basics of Sterilization.

UNIT-IV**15 Hours**

Surgical techniques - Handling of Sterilization articles in the Operation Theatre. - Techniques of Sterilization of surgical instruments and special equipment used in the operation theatre. - Management of surgical equipment and techniques. - Scrubbing techniques. - Injection techniques: Intra muscular and intra venous and insertion of I.V. Cannulas, Handling or Syringes and needles. - Types of suturing material, techniques of stitch

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *"Surgical Instrumentation: An Interactive Approach" – Nancymarie Phillips*
- *"Berry & Kohn's Operating Room Technique" – Nancymarie Phillips*
- *"Microbiology and Infection Control for Health Professionals" – Gary Lee & Penny Bishop*
- *"Fundamentals of Surgical Technology" – Paul Price*
- *"Surgical Equipment and Supplies" – Colleen J. Rutherford*

Course Title: General Microbiology	L	T	P	C
Course Code: BOA2151	4	0	0	4

Total Hours 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Explain the history and scope of microbiology, including contributions of major scientists.
2. Describe the classification and taxonomy of microorganisms (bacteria, viruses, fungi, protozoa, and algae).
3. Understand the structure and function of prokaryotic and eukaryotic cells.
4. Explain DNA replication, transcription, and translation in microorganisms.
5. Understand genetic mutations, horizontal gene transfer (transformation, transduction, conjugation).

Course Contents

UNIT-I

15 Hours

History of Microbiology, Classification of microorganisms, Microscope (Different types and uses) Morphology of bacterial cell. 2. Growth and nutrition (6 hrs) Growth and Nutrition Multiplication of bacteria, Culture media and Culture methods. Sterilization and disinfection Principles and use of equipments of sterilization, Chemicals used in disinfection Biomedical waste management principle and practice Immunology Immunity (Innate and Acquired immunity) Antigen (Definition, types, factors of antigenicity)

UNIT-II

15 Hours

Antibody (Properties, Structures Classes of immunoglobulins) List Antigen antibody reactions. Vaccines Immunization schedule Infection Definition, types and mode of transmission Hospital infections – causative agents, mode of transmission and prophylaxis Antimicrobial susceptibility testing

UNIT-III

15 Hours

Systematic bacteriology Disease caused and lab diagnosis of medically important bacteria. (Staphylococcus, Streptococcus, Gonococcus, Echerichia coli, Klebsiella, Proteus Salmonella, Shigella, Vibrio, Pseudomonas,

Mycobacteria, Treponema,) (No need of classification, antigenic structure, virulence mechanism)

UNIT-IV

15 Hours

Parasitology Introduction to Parasitology List of medically important parasites and diseases (E.histolytica, Plasmodium, Ascaris, Ancylostoma, W.bancrofti, Tape worm) Lab diagnosis of parasitic infections. Virology Introduction to virology List of medically important viruses and diseases HIV, Hepatitis, Rabies, Polio, Arboviruses (Chikungunya, Dengue, KFD,)

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *"Prescott's Microbiology" – Joanne Willey, Linda Sherwood, Christopher J. Woolverton*
- *"Microbiology: An Introduction" – Gerard J. Tortora, Berdell R. Funke, Christine L. Case*
- *"Brock Biology of Microorganisms" – Madigan, Martinko, Bender, Buckley, Stahl*
- *Bailey & Scott's Diagnostic Microbiology" – Patricia M. Tille*
- *"Microbial Biotechnology: Fundamentals of Applied Microbiology" – Alexander N. Glazer, Hiroshi Nikaido*

Course Title: Computer Application	L	T	P	Cr.
Course Code: BOA2152	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Demonstrate proficiency in utilizing computer software for laboratory data management.
2. Apply computer skills to analyze and interpret laboratory results.
3. Utilize electronic resources for accessing and managing medical information.
4. Implement cyber security best practices in a laboratory setting.
5. Effectively communicate laboratory data using computer-generated reports.

Course content

Unit-I

14 Hours

Introduction to Various Computer Parts: Input output devices: input devices (keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices); output devices (monitors, pointers, plotters, screen image projector, voice response systems). Processor and memory: The Central Processing Unit (CPU), main memory. Storage Devices: sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices.

Unit-II

12 Hours

MS- Word, Excel, Power Point: Components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge; worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs; creation and manipulation presentation, formatting and enhancing text, slide with graphs.

Unit-III**10 Hours**

Introduction of Windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.).

Unit-IV**9 Hours**

Application of Computers in Various Fields: Medical, Education, Railway, Defense, Industry, Management, Sports, Commerce, Internet.

Transactional Mode: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Reading:

- *Sunita Goel, 'Computer Fundamentals', Pearson Publication.*
- *Anupam Jain and Avneet Mehra, 'Computer Fundamental MS Office: Including Internet & Web Technology'.*
- *P.K. Sinha, 'Introduction to Computers' BPB Publications.*
- *Raymond Greenlaw, 'Fundamentals of the Internet & the World Wide Web'.*
- *Sunjay Saxena, 'Introduction to Computers and MS Office'*

Course Title: Nutrition	L	T	P	Cr.
Course Code: BOA2153	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Understand the basic principles of nutrition and their relevance to health.
2. Identify essential nutrients and their functions.
3. Apply dietary guidelines to promote health and prevent disease.
4. Recognize the role of nutrition in various health conditions.
5. Provide basic nutritional counseling and education.

Course Content

Unit I

10 Hours

Fundamentals of Nutrition

- Introduction to nutrition: Definition, scope, and importance.
- Essential nutrients: Macronutrients (carbohydrates, proteins, fats) and micronutrients (vitamins, minerals).
- Digestion, absorption, and metabolism of nutrients.
- Energy balance and requirements.
- Food groups and dietary guidelines.

Unit II

10 Hours

Nutritional Assessment and Planning

- Methods of nutritional assessment: Anthropometric measurements, biochemical assessments, clinical assessments, and dietary assessments.
- Dietary planning and meal preparation.
- Nutritional needs across the lifespan: Infants, children, adolescents, adults, and elderly.
- Special dietary considerations: Vegetarian, vegan, and cultural diets.

Unit III

12 Hours

Nutrition in Health and Disease

- Role of nutrition in disease prevention and management.

- Nutrition-related disorders: Obesity, malnutrition, diabetes, cardiovascular diseases, and cancer.
- Enteral and parenteral nutrition.
- Food safety and hygiene.
- Food allergies and intolerances.

Unit IV**13 Hours**

Nutritional Counseling and Education

- Principles of nutritional counseling.
- Effective communication and patient education.
- Promoting healthy eating habits.
- Addressing common nutritional misconceptions.
- Community nutrition and public health.

Transactional Mode: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Reading:

- Whitney, E., & Rolfes, S. R. (2019). *Understanding nutrition*. Cengage Learning.
- Srilakshmi, B. (2014). *Dietetics*. New Age International.
- Wardlaw, G. M., & Smith, A. M. (2018). *Contemporary nutrition*. McGraw-Hill Education.

Course Title: Surgical Equipment and Technology Lab	L	T	P	Cr.
Course Code: BOA2154	0	0	2	1

Total Hours 30 hrs

Learning Outcomes: On the completion of the course, the students will be able:

1. Identify and describe the function of various surgical instruments, including scalpels, forceps, retractors, and electrosurgical devices.
2. Demonstrate proper handling, maintenance, and sterilization of surgical instruments.
3. Explain the working principles of surgical devices such as electrocautery, lasers, and robotic surgery systems.
4. Understand the role of imaging technologies (e.g., fluoroscopy, ultrasound) in surgical procedures.
5. Operate basic and advanced surgical devices safely and efficiently.

Course Content

List of practical's/ Experiment

30 hours

1. Overview of surgical instruments and their classifications
2. Basic principles of surgical technology
3. Sterilization and infection control
4. Cutting and dissecting instruments (scalpels, scissors)
5. Principles of electrosurgery (monopolar and bipolar)
6. Safety considerations in electrosurgery
7. Anesthesia machines and ventilators
8. Laparoscopic towers and insufflators
9. Robotic-assisted surgery basics (da Vinci system)
10. Ergonomics and layout of the OR
11. Sterile techniques and draping
12. Surgical smoke evacuation and environmental hazards
13. Principles of robotic-assisted surgery
14. Instrumentation and robotic platforms
15. Benefits and challenges of robotic surgery
16. Types of lasers used in surgery (CO₂, Nd:YAG, diode)
17. Safety measures for laser use in surgery
18. Applications in various surgical specialties

Course Title: Communication and Presentation Skills	L	T	P	Cr.
Course Code: BOA2155	2	0	0	2

Total Hours 30 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Demonstrate clear and effective verbal and non-verbal communication.
2. Construct and deliver organized and engaging presentations.
3. Apply active listening and interpersonal skills in professional settings.
4. Produce accurate and professional written communication.
5. Use appropriate tone, pitch, and pace for effective speaking.

Course Content

UNIT I

7 Hours

- 1) Communication: Definition, meaning.
- 2) Importance of Communication in Health
- 3) Functions of Communication.

UNIT II

7 Hours

- 1) Communication channels - Definition dimension and classification, selection of communication channels.
- 2) Feedback in communication – Feedback process, effect of feedback in health communication.
- 3) Problems in communication - various types of problems.

UNIT III

7 Hours

- 1) Mass communication e.g. Radio, television, traditional systems like nukkadnatak, drama, puppet show
- 2) Inter personal communication: Lecture method (IPC).

UNIT IV

9 Hours

- 1) Intrapersonal communication like demonstration, group discussions, seminars symposium, workshop, conference, CME, communication network
- 2) Various ways of creating awareness about health-related issues

3) Counseling, pretest counseling, posttest counseling.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- Loveleen Kaur, 'Communication Skills' Satya Prakashan Publication.
- Narinder Kumar Bodhraj, 'Business Communication', Kalyani Publishers, 2011.
- S.P. Dhanavel, 'English & communication Skills for the Students of Science & Engineering' Orient blackswan publication, 2009.
- Indrajit Bhattacharya, 'An Approach to Communication Skills'.
- Chissie Wright, 'Handbook of Practical Communication Skills'.

Course Title: Human Values and Professional Ethics	L	T	P	Cr.
Course Code: VAC0002	2	0	0	2

Total Hours 30 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Understand the essence of Indian ethos, cultural values and ethical principles derived from scriptures, integrating self-exploration with scientific inquiry.
2. Analyze human values, self-awareness and ethical decision-making by distinguishing between perspectives, ideologies and universal moral principles.
3. Evaluate constitutional values, global responsibilities and the role of ethics in citizenship while promoting inclusivity and social welfare.
4. Develop essential life skills, stress management techniques and holistic well-being through mindfulness, self-discipline and personality development.
5. Recognize the significance of fundamental human values such as truth, integrity, empathy, and respect.

Course Content

Unit-I

7 Hours

Meaning of ethos and cultural essence of India, Scriptures as the base of the Indian Knowledge System (IKS), Integrating the two methodologies: interiorization process for self-exploration and exterior scientific pursuit for the prosperity of world, The Law of Karma and Nishkama Karma (The Law of action and selfless action), Practical: Five hours of Yoga practice per week, Ethics through Music and Indian Poetry, Community Engagement

Unit-II

8 Hours

Knowing the Self and the universal values that we stand for. This is self-enquiry & self-discovery, Background conversations and deep listening, recognizing the assumptions that we make, the biases we have and the implications for ethical action. Self-identity: distinguishing and embracing oneself (and others) four profiles (inner potential, social, professional, personality), Distinguish ideology, perspectives beliefs from embodying values. Practical: Self-discovery, self-enquiry and Mindfulness, Yama & Niyama of Ashthang Yoga

Unit-III**7 Hours**

Values embedded in the Preamble of the Indian Constitution, Integration of Human Rights and duties. Principles and responsibilities: as citizens of India, towards global environment, Loksangraha and VasudhaivaKutumbakam, Conscious Full Spectrum Response model. Distinguishing judgement from discernment, Practical: Development of concentration among students through music, fine arts, mathematics, sports, yoga and mindfulness

Unit-IV**8 Hours**

The three gunas (qualities of sattva—purity and harmony, rajas —activity and passion, tamas —darkness and chaos), the four antah-karanas (inner instruments) and panch kosha (five sheaths), Stress management, Oneness, non-duality and equanimity, Physical, mental, social and spiritual well-being. Practical: Talks on importance of the Ayurvedic concept of well-being and nutrition, sports activities.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- Mahadevan, B., Bhat, V.R. and Nagendra, P.R.N. 2022. *Introduction to Indian Knowledge System*. Delhi: PHI.
- *Human Values and Professional Ethics* by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010.
- Kashyap, Subhash C. 2019. *Constitution of India. A handbook for students*. New Delhi: National Book Trust.
- Dr. Awadesh Pradhan, *Mahamanake Vichara*". (B.H.U., Varanasi 2007)
- Harold Koontz & Heinz Weihrich, *Essentials of Management*, Tata McGraw Hill.
- Lama, D. 2012. *Beyond Religion: Ethics for a Whole World*. India: Harper Collins.

Course Title: Basic Anesthesia Technology	L	T	P	C
Course Code: BOA2156	4	0	0	4

Total Hours 60 h

Learning Outcomes: After completion of this course, the learner will be able:

1. Explain the principles and history of anesthesia in medical practice.
2. Differentiate between general, regional, and local anesthesia techniques.
3. Identify the stages of anesthesia (induction, maintenance, and emergence).
4. Understand the importance of pre-anesthetic evaluation (airway assessment, ASA classification).
5. Explain the use of monitoring devices (ECG, pulse oximeter, capnography, blood pressure monitoring).

Course Contents

UNIT-I

15 Hours

Physical layout of surgical suite • Transition zones • Location • Peripheral support areas • Layout of operation theatre • Special procedure rooms 2. Care of perioperative environment • Establishing surgical environment • Transportation of patient to the O.T • Environmental, physical, chemical, and biological hazards • Appropriate operating room attire 3. Sterilization of instruments and O.T cleaning • Daily terminal cleaning • Decontamination and disinfection & sterilization ♦ Definition ♦ Thermal sterilization ♦ Autoclaving ♦ CSSD & its functioning

UNIT-II

15 Hours

General care and testing of instruments • Assembly and packing of instruments • WHO checklist (safe surgery) 4. Biomedical waste management 5. Anaesthesia machine • Central gas supply • Safety features of anaesthesia machine • Medical gas cylinders • Pressure control system • Flow meters • Vaporizers 6. Anaesthesia techniques • History • Pre-operative, intra-operative and post-operative care of patients • General anaesthesia• Regional anaesthesia• Combined spinal and epidural anaesthesia• Neuraxial blockades • Positioning the patients 7. Intraoperative monitoring • Pulse oximetry• Capnography • ECG monitoring

UNIT-III

15 Hours

NIBP • IBP • CVP • Temperature • TEE • BIS • NEUROMUSCULAR MONITORING 8. Airway equipments• Supraglottic airway devices including

igel, LMA, BASKAMASK, etc • Face mask • Airways • Combitube • AMBU bag • Intubation devices • Different types of Laryngoscopes • Endotracheal tubes • Flexible fiberoptic bronchoscope 9. Breathing systems • Classifications • Oxygen therapy • Mechanical ventilation 10. Difficult airway management devices • Indications and contraindications • Retrograde intubation • Cricothyroidectomy • Tracheostomy • Styilet, bougies • Jet ventilation • Video laryngoscopes

UNIT-IV

15 Hours

Equipments used inside OT • Humidifier • Warming devices • Suction equipment • Peripheral nerve stimulator • Defibrillator • Infusion pump • Nerve locator • Diathermy or cautery device • OT lights • Scavenging systems • Basic introduction to laparoscopy unit including insufflators, cameras, telescope etc 12. Anaesthetic agents • Premedication • Analgesics • Muscle relaxants • Inhalational agents • Emergency drugs • Induction agents • Sedatives • Local anaesthetics • IV fluids • Blood transfusion • Antiemetics 13. Principles of monitored anaesthesia care-MAC 14. Introduction to CPR/resuscitation- BLS

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *"Basics of Anesthesia" – Ronald D. Miller & Manuel C. Pardo Jr.*
- *"Morgan & Mikhail's Clinical Anesthesiology" – John F. Butterworth, David C. Mackey, John D. Wasnick*
- *"Textbook of Anaesthesia" – A. R. Aitkenhead, D. J. Rowbotham, G. Smith*
- *"Spinal, Epidural, and Caudal Anesthesia" – J. A. Wildsmith & J. D. Armitage*
- *"Stoelting's Pharmacology and Physiology in Anesthetic Practice" – Robert K. Stoelting, Simon C. Hillier*

Course Title: Social Pharmacy	L	T	P	Cr.
Course Code: BOA2157	4	0	0	4

Total Hours: 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Deliberate about roles of pharmacists in the various national health programs
2. Describe various sources of health hazards and disease preventive measures
3. Discuss the healthcare issues associated with food and nutritional substances
4. Describe the general roles and responsibilities of pharmacists in public health

Course Contents

UNIT-I

15 Hours

Introduction to Social Pharmacy Definition and Scope. Social Pharmacy as a discipline and its scope in improving the public health. Role of Pharmacists in Public Health. Concept of Health - WHO Definition, various dimensions, determinants, and health indicators. National Health Policy – Indian perspective. Public and Private Health System in India, National Health Mission, Introduction to Millennium Development Goals, Sustainable Development Goals, FIP Development Goals.

UNIT-II

15 Hours

Preventive healthcare – Role of Pharmacists in the following, Demography and Family Planning. Mother and child health, importance of breastfeeding, ill effects of infant milk substitutes and bottle-feeding Overview of Vaccines, types of immunity and immunization

UNIT-III

15 Hours

Nutrition and Health Basics of nutrition – Macronutrients and Micronutrients, Importance of water and fibers in diet Balanced diet, Malnutrition, nutrition deficiency diseases, ill effects of junk foods, calorific and nutritive values of various foods, fortification of food , Introduction to

food safety, adulteration of foods, effects of artificial ripening, use of pesticides, genetically modified foods , Dietary supplements, nutraceuticals, food supplements – indications, benefits, Drug-Food Interactions

UNIT-IV

15 Hours

Introduction to health systems and all ongoing National, Health programs in India, their objectives, functioning, outcome, and the role of pharmacists.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *Textbook of Pharmacognosy by C. K. Kokate, S. B. Gokhale, A.P.Purohit, NiraliPrakashan*
- *Textbook of Pharmacognosy by C.S. Shah and J. S. Qadry, CBSPublishers& Distributors Pvt. Ltd.*
- *Text Book of Pharmacognosy by T. E. Wallis. CB Publishers &DistributorsPvt. Ltd.*
- *Study of crude drugs by M. A. Iyengar, Manipal Press Ltd,*
- *Manipal Powder crude drugs by M. A. Iyengar, Manipal Press Ltd,*
- *Manipal Anatomy of crude drugs by M. A. Iyengar, Manipal Press Ltd, Manipal*

SEMESTER 3rd

Course Title: General Anesthesia	L	T	P	C
Course Code: BOA3200	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Define general anesthesia (GA) and its principles.
2. Explain the stages of anesthesia (Induction, Maintenance, Emergence, Recovery).
3. Understand the pharmacokinetics and pharmacodynamics of anesthetic agents.
4. Describe different types of inhalational anesthetics (e.g., Isoflurane, Sevoflurane, Desflurane, Nitrous Oxide).
5. Explain the mechanism of action of intravenous anesthetic agents (e.g., Propofol, Ketamine, Etomidate, Thiopental).

Course Contents**UNIT-I****10 Hours**

Introduction: General Anaesthesia- History, Components of General Anesthesia, Triad of General Anaesthesia, Balanced Anaesthesia- Meaning & benefits, Stages of General Anaesthesia (Guedel's Classification)- Surgical Anesthesia Stage, Reflexes lost during each stage of General Anesthesia & use of this classification in current General Anesthesia Practice.

UNIT-II**10 Hours**

Indications of General Anaesthesia, Contraindications of General Anaesthesia. Advantages & Disadvantages of General Anesthesia over Regional Anesthesia, Techniques of General Anesthesia-TIVA & Sedation, Preparations for General Anaesthesia- OT Preparation, Equipment Preparation & Patient Preparation. Pre-Anesthesia Checkup (PAC) & various investigations done during PAC. Role of Anesthesia & OT Assistant in Preparation for General Anesthesia.

UNIT-III**10 Hours**

Pre-Anesthetic medication- Goals, modifications & contraindications, Pre-operative Fasting- Guidelines & advantages & management of a full stomach patient, Special consideration in Pregnant patient for General Anesthesia. Patient Preparation and transport of patient to the OT. Gases used in Anaesthesia- Oxygen, N₂O, Halothane, Isoflurane, Sevoflurane & Desflurane.

UNIT-IV**15 Hours**

Muscle relaxants- use, effects & dosage, Analgesics- Uses in GA & complications Reversal- use & effects with dosage. Complications of General Anaesthesia- intraoperative, immediate, postoperative & delayed. Post-operative care after anesthesia.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *"Miller's Anesthesia" – Michael A. Gropper, Lars I. Eriksson, Lee A. Fleisher*
- *"Morgan & Mikhail's Clinical Anesthesiology" – John F. Butterworth IV, David C. Mackey, John D. Wasnick*
- *"Basics of Anesthesia" – Ronald D. Miller, Manuel Pardo*
- *"Pharmacology for Anaesthesia and Intensive Care" – T. E. Peck, S. A. Hill, M. Williams*
- *"Anesthesia and Perioperative Complications" – Jonathan Benumof*

Course Title: General Pharmacology	L	T	P	C
Course Code: BOA3201	4	0	0	4

Total Hours 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Define pharmacology and understand its branches (pharmacokinetics, pharmacodynamics, clinical pharmacology, etc.).
2. Explain the routes of drug administration (oral, intravenous, intramuscular, subcutaneous, etc.) and their significance.
3. Describe the factors influencing drug absorption, distribution, metabolism, and excretion (ADME).
4. Explain absorption, bioavailability, and first-pass metabolism of drugs.
5. Describe drug distribution and factors affecting it (protein binding, blood-brain barrier, etc.).

Course Contents

UNIT-I

15 Hours

General Principles of Pharmacology, Introduction to Pharmacology, Definition and scope, Importance of pharmacology in medical practice, Pharmacological Classification of Drugs, Basis of classification (mechanism of action, therapeutic use, chemical structure), Overview of major drug classes

Routes of Drug Administration, Enteral (oral, sublingual, rectal), Parenteral (intravenous, intramuscular, subcutaneous, intradermal), Topical and inhalational routes, Advantages and disadvantages of different routes

Drug Toxicity & Poisoning, Definition and types of drug toxicity, Common toxic effects of drugs, Prevention of poisoning, General principles of poisoning management.

Adverse Drug Reactions (ADR), Types of ADR (Type A and Type B reactions), Mechanisms of ADR, Management and reporting of ADR

UNIT-II

15 Hours

Cardiovascular and Emergency Drugs Antihypertensive Drugs, Classification, Mechanism of action, therapeutic uses, and side effects,

Alpha- & Beta-Adrenergic Antagonists, Vasodilators, Calcium Channel Blockers

Antiarrhythmic Drugs, Classification (Vaughan-William's classification), Mechanism of action, Side effects and clinical applications

Cardiac Glycosides, Mechanism of action and therapeutic uses, Digitalis toxicity and its management.

Drugs Used in Haemostasis, Anticoagulants (Heparin, Warfarin), Thrombolytics and Antithrombotic drugs.

Drugs for the Treatment of Shock, Vasopressors and inotropes, Fluid resuscitation agents, Role of corticosteroids in shock.

Emergency Drugs, Drugs used in cardiac arrest, anaphylaxis, seizures, and respiratory distress, Dosing and administration protocols

UNIT-III

15 Hours

General Anaesthetics, Classification, Pharmacokinetics and pharmacodynamics of inhaled anaesthetic agents, Intravenous general anaesthetic agents, Inhalational gases and their use in anaesthesia.

Local Anaesthetics, Classification and mechanism of action, Duration of action and methods to prolong it, Preparation, dose, and routes of administration.

Analgesics (Pain Management Drugs), Non-opioid analgesics (NSAIDs, Paracetamol), Opioid analgesics (Morphine, Fentanyl), Routes of administration, dosing, and side effects.

Antihistamines and Antiemetics, Classification, Mechanism of action, Adverse effects, Preparations, dose, and routes of administration.

Alcohol, Sedatives, Hypnotics, and Narcotics, CNS depressants: Classification and mechanism of action, Side effects and toxicity management.

CNS Stimulants and Neuromuscular Blocking Agents, Classification, Mechanism of action, Clinical applications and side effects

UNIT-IV**15 Hours**

Endocrine, Renal, and Chemotherapeutic Drugs: Corticosteroids, Classification (Glucocorticoids & Mineralocorticoids), Mechanism of action, Adverse effects and complications, Preparation, dose, and routes of administration.

Diuretics: Classification, Mechanism of action, Adverse effects, Preparation, dose, and routes of administration.

Chemotherapeutic Drugs: Definition and classification, Mechanism of action of antimicrobial agents, Commonly used antibiotics and their spectrum of activity, Principles of antibiotic resistance and stewardship

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Readings:

- *"Rang & Dale's Pharmacology" – Humphrey P. Rang, James M. Ritter, Rod J. Flower, Graeme Henderson*
- *"Katzung's Basic & Clinical Pharmacology" – Bertram G. Katzung*
- *"Essentials of Medical Pharmacology" – K.D. Tripathi*

Course Title: First Aid	L	T	P	Cr.
Course Code: BOA3202	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Provide appropriate first Aid form in or injuries including small cuts, grazes, bruises etc.
2. Assess situations and circumstances in order to provide First Aid safely, promptly and effectively in arrange of emergencies.
3. Manage organizations, records related to patients and departmental statistics.
4. Identify signs and symptoms of common medical emergencies, injuries, and accidents.
5. Learners will understand the importance of clear communication, including how to give concise instructions, alert emergency services, and provide relevant information during a crisis.

Course Contents

UNIT-I

15 Hours

First aid: Aims and objectives of first aid; wounds and bleeding, dressing and bandages; pressure and splints, supports etc. Shock; insensibility; asphyxia; convulsions; resuscitation, use of suction apparatus; drug reactions; prophylactic measures; administration of oxygen; electric shock; burns; scalds; haemorrhage; pressure points; compression band. Fractures; splints, bandaging; dressing, foreign bodies; poisons.

UNIT-II

10 Hours

Infection: Bacteria, their nature and appearance; spread of infections; auto-infection or cross-infection; the inflammatory process; local tissue reaction, general body reaction; ulceration; Asepsis and antisepsis. Universal precautions, hospital acquired infections-HIV, Hepatitis B, C, and MRSA etc.

UNIT-III**10 Hours**

Principles of Asepsis: Sterilization- methods of sterilization; use of central sterile supply department; care of identification of instruments, surgical dressings in common use, including filament swabs, elementary operating theatre procedure; setting of trays and trolleys

UNIT-IV**10 Hours**

Departmental procedures: Department staffing and organizations; records relating to patients and departmental statistics; professional attitudes of the technologist to patients and other members of the staff, medico-legal aspects accidents in the department

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Readings:

- *Curry, T.S., Dowdey, J.E., & Murray, R.C. (1990). Christensen's physics of diagnostic radiology. Lippincott Williams & Wilkins.*
- *Podgoršak, E. B. (2006). Radiation physics for medical physicists (Vol. 1). Berlin: Springer.*
- *Weishaupt, D., Köchli, V. D., & Marincek, B. (2008). How does MRI work?: an introduction to the physics and function of magnetic resonance imaging. Springer Science & Business Media.*

Course Title: Disaster Management	L	T	P	Cr.
Course Code: BOA3203	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Understand the principles of disaster management.
2. Identify and classify different types of disasters.
3. Apply emergency medical response protocols in disaster situations.
4. Participate in disaster preparedness and mitigation activities.
5. Communicate effectively during disaster response.

Course Contents

Unit I

15 Hours

Introduction to Disaster Management

- Definitions and concepts of disaster, hazard, risk, and vulnerability.
- Types of disasters: Natural (earthquakes, floods, cyclones) and man-made (chemical spills, industrial accidents).
- The disaster management cycle: Mitigation, preparedness, response, and recovery.
- National and international disaster management frameworks.
- Role of paramedical professionals in disaster management.

Unit II

10 Hours

Disaster Preparedness and Mitigation

- Risk assessment and vulnerability analysis.
- Developing disaster management plans.
- Early warning systems and communication strategies.
- Community-based disaster preparedness.
- First aid and basic life support training.
- Resource management and logistics.

Unit III**10 Hours**

Emergency Medical Response in Disasters

- Triage and casualty management.
- Management of trauma and injuries.
- Infection control and sanitation.
- Psychological first aid.
- Mass casualty incidents and field hospitals.
- Transportation of injured people.

Unit IV**10 Hours**

Post-Disaster Recovery and Rehabilitation

- Needs assessment and damage evaluation.
- Rehabilitation and reconstruction.
- Mental health and psychosocial support.
- Disease surveillance and prevention.
- Ethical considerations in disaster management.
- Legal aspects of disaster management.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question Answer

Suggested Readings:

- Alexander, D. (2016). *Natural disasters*. Routledge.
- Haddow, G. D., Bullock, J. A., & Coppola, D. P. (2017). *Introduction to emergency management*. Butterworth-Heinemann.
- Carter, W.N. (1991). *Disaster Management: A Disaster Manager's Handbook*. Asian Development Bank.
- WHO, (Various publications) *World Health Organization emergency and disaster related publications*.

Course Title: General Anesthesia Lab	L	T	P	Cr.
Course Code: BOA3204	0	0	2	1

Total Hours 30 hrs

Learning Outcomes: On the completion of the course, the students will able:

1. Explain the physiological effects of general anesthesia on the cardiovascular, respiratory, and nervous systems.
2. Describe the pharmacokinetics and pharmacodynamics of common general anesthetic agents.
3. Identify different types of anesthetic drugs, including induction agents, inhalational anesthetics, muscle relaxants, and reversal agents.
4. Understand the principles of preoperative assessment and patient preparation for general anesthesia.
5. Recognize complications associated with general anesthesia and their management strategies.

Course Content

List of practical's/ Experiment

30 hours

1. Definition and principles of general anesthesia
2. Indications and contraindications
3. Overview of anesthesia machines and equipment
4. Patient evaluation: ASA classification
5. Airway assessment and difficult airway predictors
6. Preoperative fasting guidelines
7. Common premedications and their effects
8. Bag-mask ventilation
9. Endotracheal intubation (ETT)
10. Supraglottic airway devices (LMA)
11. Rapid Sequence Intubation (RSI)
12. Capnography and confirmation of airway placement
13. Standard ASA monitoring guidelines
14. Pulse oximetry, capnography, ECG, and blood pressure monitoring
15. Neuromuscular blockade monitoring (TOF - Train-of-Four)
16. Balanced anesthesia techniques
17. Total intravenous anesthesia (TIVA)

18. Inhalational anesthesia strategies
19. Fluid and hemodynamic management
20. Hypotension and hypertension under anesthesia
21. Anaphylaxis and drug reactions

Course Title: English for Clinical Language	L	T	P	Cr.
Course Code: BOA3205	2	0	0	2

Total Hours 30 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Understand and utilize medical terminology accurately.
2. Communicate effectively with patients and healthcare professionals.
3. Write clear and concise medical reports and documentation.
4. Demonstrate professional communication skills in healthcare settings.
5. Students will acquire the necessary vocabulary related to medical procedures, diagnoses, treatments, and anatomy, enabling them to confidently understand and use clinical terms in both verbal and written communication.

Course Content

UNIT I

7 Hours

Foundations of Medical Terminology

- 1) Introduction to medical terminology: Roots, prefixes, suffixes.
- 2) Anatomical and physiological terms.
- 3) Terms related to common diseases and conditions.
- 4) Understanding and using medical abbreviations.
- 5) Pronunciation and spelling of medical terms.

UNIT II

7 Hours

Patient Communication and Interaction

- 1) Effective communication techniques with patients.
- 2) Taking patient history and conducting interviews.
- 3) Explaining medical procedures and treatments.
- 4) Handling difficult or sensitive conversations.
- 5) Cultural sensitivity in patient communication.

UNIT III

7 Hours

Medical Documentation and Report Writing

- 1) Principles of medical documentation.

- 2) Writing patient reports and case studies.
- 3) Documenting medical procedures and observations.
- 4) Using medical charts and electronic health records (EHR).
- 5) Grammar and style for medical writing.

UNIT IV

9 Hours

Professional Communication in Healthcare

- 1) Communication with other healthcare professionals.
- 2) Presenting medical information in meetings and conferences.
- 3) Using professional email and correspondence.
- 4) Ethical considerations in medical communication.
- 5) Developing presentation skills.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- Young, B. A. (2018). *Medical terminology: An illustrated guide*. F.A. Davis.
- Rice, R. (2017). *Medical terminology with human anatomy*. Pearson.
- Boothman, R. C. (2013). *How to Connect in Business in 90 Seconds or Less*. Pearson.
- Geffner, D. (2018). *The Skilled Helper: A Problem-Management and Opportunity-Development Approach to Helping*. Cengage Learning.

Course Title: Hospital Infection Control and Preventions	L	T	P	Cr.
Course Code: VAC0003	2	0	0	2

Total Hours 30 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Define infection control and explain its importance in the hospital setting.
2. Explain the nature and characteristics of pathogens (bacteria, viruses, fungi, and parasites).
3. Understand the role of surveillance in preventing infections.
4. Understand the unique infection risks posed to vulnerable patient populations (e.g., immunocompromised patients).
5. Participants will learn to identify common healthcare-associated infections, their symptoms, and risk factors, and understand how they are transmitted within hospital environments.

Course Content

UNIT-I

7 Hours

Introduction to Infection Control

- Definition and importance of infection control in hospitals
- Types of infections in healthcare settings (e.g., nosocomial infections, cross-contamination)
- Impact of hospital-acquired infections (HAIs) on patient outcomes, healthcare workers, and hospital operations
- Legal and ethical considerations in infection control

Key Concepts and Terminologies

- Infections vs. Colonization
- Modes of Transmission (contact, droplet, airborne, etc.)
- Reservoirs, portals of entry and exit, and susceptible hosts
- Infection Control principles (Isolation, Standard Precautions, etc.)

Microbial Pathogens in Healthcare Settings

- Bacteria, viruses, fungi, and parasites commonly found in healthcare settings
- Antibiotic-resistant pathogens (e.g., MRSA, C. difficile, CRE, etc.)
- Understanding pathogenicity and virulence

UNIT-II**7 Hours**

Standard Precautions

- Hand hygiene (indications, techniques, alcohol-based hand rubs, and soap-and-water washing)
- Personal Protective Equipment (PPE) – types, proper use, and disposal
- Respiratory hygiene and cough etiquette
- Safe injection practices and needle-stick injury prevention
- Cleaning, disinfecting, and sterilizing medical equipment

Transmission-Based Precautions

- Contact Precautions: Types of infections and examples (e.g., MRSA, C. difficile)
- Droplet Precautions: Infections transmitted by respiratory droplets (e.g., influenza, COVID-19)
- Airborne Precautions: Diseases that require negative pressure rooms (e.g., tuberculosis, measles)
- Special considerations for managing different infection types

Safe Handling of Waste

- Procedures for handling and disposing of contaminated waste and sharps
- Infectious waste segregation and labeling protocols

UNIT-III**7 Hours**

Infection Control in Patient Care Areas

- Isolation rooms: Purpose and proper usage
- Operating rooms and intensive care units (ICUs): Infection control in high-risk areas
- Infectious disease outbreaks in hospitals (managing outbreaks, tracing sources)
- Infection control in maternal and child health settings
- Infection control in dialysis centers

Infection Control in Healthcare Personnel

- Health and safety protocols for healthcare workers
- Employee vaccinations and screenings (e.g., flu, TB, hepatitis B)
- Preventing occupational exposures (e.g., sharps injuries, blood-borne pathogens)
- Post-exposure management and protocols

Infection Control in Visitors and Family Members

- Visitor screening and restrictions during outbreaks
- Ensuring visitor compliance with infection control measures
- Education and training for family members

UNIT-IV

7 Hours

Surveillance Systems and Reporting

- Infection surveillance: Purpose, methods, and types (e.g., active vs. passive surveillance)
- Tracking infections and outbreaks: Key performance indicators and metrics
- Using data to drive infection control efforts (e.g., infection rate reduction)

Audits and Inspections

- Conducting infection control audits
- Monitoring adherence to infection control protocols
- Corrective actions and improvement plans following audit results

Training and Education

- Role of ongoing education for healthcare staff
- Infection control training programs and their effectiveness
- Building a culture of safety: Encouraging staff engagement and compliance

Research and Advancements in Infection Control

- New technologies in infection prevention (e.g., UV light, antimicrobial surfaces)
- Current research trends and innovations in hospital infection control
- The role of antimicrobial stewardship in preventing infections

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *World Health Organization. WHO Guidelines on Hand Hygiene in Health Care. Geneva: WHO; 2009.*
- *Grol R, Wensing M, Eccles M. Improving Patient Care: The*

Implementation of Change in Clinical Practice. 2nd ed. Edinburgh: Elsevier; 2013.

- *Mayo Clinic. Infection Control: Preventing Healthcare-associated Infections. Mayo Clinic Press; 2016.*
- *Goh KT, Salim A, Buehler JW. Microbiology of Hospital Infections. 3rd ed. New York: Springer; 2017.*
- *Spence RP, Stevens DL. Infection Control: A Practical Approach. 1st ed. Oxford: Oxford University Press; 2012.*
- *Centers for Disease Control and Prevention (CDC). Infection Control Guidelines. Atlanta: CDC; 2019.*

Course Title: Operation Theater safety and Infection	L	T	P	C
Course Code: BOA3206	4	0	0	4

Total Hours 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Understand the importance of OT safety protocols in preventing accidents and infections.
2. Explain the layout and design of an OT to ensure a sterile environment.
3. Identify and manage common hazards in the OT, including electrical, fire, and radiation hazards.
4. Explain the sources and modes of transmission of infections in the surgical environment.
5. Understand the concepts of asepsis, sterilization, and disinfection in OT.

Course Contents

UNIT-I

15 Hours

Introduction to Infection Control in OT, Importance of infection control, Sources and transmission of infections in OT, Standard infection control protocols.

Effective Hand Hygiene, Importance of hand hygiene in OT, WHO's five moments for hand hygiene, Handwashing techniques: Soap and water, Alcohol-based hand rub, Surgical hand antisepsis.

Personal Protective Equipment (PPE), Types of PPE (Gloves, masks, gowns, face shields, shoe covers), Proper donning and doffing techniques, Disposal and management of used PPE.

Prevention and Control of Healthcare-Associated Infections (HAIs), Common HAIs (Surgical site infections, MRSA, Catheter-associated infections), Strategies for reducing HAIs in OT, Role of healthcare workers in infection control.

Guidelines for Hospital Infection Control, NABH (National Accreditation Board for Hospitals) guidelines, JCI (Joint Commission International) standards.

UNIT-II**15 Hours**

Sterilization: Definition & Importance, Principles of sterilization, Types of sterilization methods (Physical, Chemical, Gaseous), Autoclaving: Procedure, parameters, precautions, Dry heat sterilization, Plasma sterilization, Ethylene oxide sterilization, Use of biological and chemical indicators for sterilization.

Disinfection: Concept and Classification, Levels of disinfection (High, Intermediate, Low-level disinfection), Types of disinfectants: Alcohols, Aldehydes, Phenols, Quaternary ammonium compounds, Safe handling and usage of disinfectants.

Collection and Handling of Used Items, Collection of used surgical instruments from OT, Safe transportation and reception protocols, Protective clothing for handling contaminated instruments.

Sorting and Classification of Instruments, Sharp instruments (scalpels, needles), Blunt instruments (forceps, retractors), Delicate and heat-sensitive instruments, Classification for different cleaning techniques

UNIT-III**15 Hours**

Cleaning Procedures in OT, Importance of proper cleaning before sterilization, Manual cleaning vs. Mechanical cleaning, Use of detergents and enzymatic cleaners, Role of ultrasonic cleaners.

Decontamination of OT Equipment, Cleaning of jars, trays, and basins, Cleaning of catheters, tubing, and glassware, Special cleaning protocols for delicate instruments, Maintenance of reusable surgical instruments.

Safe Handling of Contaminated Materials, Proper disposal of sharps and biohazardous waste, Guidelines for handling reusable surgical instruments, Occupational safety measures for OT staff.

Disinfection of OT Environment, Terminal cleaning procedures in OT, Use of fumigation and UV sterilization techniques, Frequency and schedule of OT disinfection.

UNIT-IV**15 Hours**

Materials Used for Wrapping & Packaging Types of wrapping materials (Paper, Linen, Non-woven fabrics), Selection of appropriate wrapping material, Packaging techniques for sterile instruments.

Types of Packs and Assembly of Sterile Load Individual instrument packs, Procedure packs and drape packs, Standardized packing methods for sterilization.

Indicators and Quality Assurance in Sterilization Use of chemical indicators (Tape indicators, Chemical strips), Biological indicators and their significance, Monitoring and documentation of sterilization cycles.

Shelf-life and Distribution of Sterile Materials Expiry dates of sterilized items, Storage conditions for sterile packs, Proper handling and distribution of sterile materials within OT.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *"Berry & Kohn's Operating Room Technique" – Nancymarie Phillips*
- *"Alexander's Care of the Patient in Surgery" – Jane C. Rothrock*
- *"Perioperative Safety" – Donna S. Watson*
- *"Infection Control in the Intensive Care Unit" – Manish Soneja, SK Kabra*
- *"Biohazardous Waste Management" – Shiv Sanjeevi*

Course Title: Biochemistry	L	T	P	Cr.
Course Code: BOA3207	4	0	0	4

Total Hours: 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Study the chemistry of carbohydrate, lipids, proteins and amino acid
2. Narrate the significance of biochemistry in patient's status.
3. Clarify the importance of mineral and vitamins in human body.
4. Recognize the Nomenclature, Classification, Factors affecting enzyme activity
5. Accept the brief description of chemistry of blood.

Course Contents

UNIT-I

15 Hours

Carbohydrates - Glucose and Glycogen Metabolism Proteins Classification of proteins and functions Lipids- Classification of lipids and functions

UNIT-II

15 Hours

Enzymes- Definition, Nomenclature, Classification, Factors affecting enzyme activity, Active site. Coenzyme, Enzyme Inhibition, Units of enzymes, Iso-enzymes and Enzyme pattern in diseases

UNIT-III

15 Hours

Vitamins & Minerals- Fat soluble vitamins (A, D, E, K), water soluble vitamins, B-complex vitamins, principal elements (Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chlorine and Sulphur), trace elements, calorific value of foods, Basal Metabolic Rate (BMR), Respiratory Quotient (RQ), Specific Dynamic Action (SDA), balanced diet, Marasmus and Kwashiorkor Acids and bases Definition, pH, Henderson – Hassel Balch equation, Buffers, Indicators, Normality, Molarity, Molality, Hormones

UNIT-IV

15 Hours

Nomenclature of compounds containing Halogen. Alcohols and Phenol, Ethane, Propane, Ether, Aldehydes, Ketones, Carboxylic acid, Cyanides,

Isocyanides, Nitrogen compounds and amines. Catalysis Hemoglobin, Blood and respiration

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *Textbook of Medical Biochemistry M N and Shinde Rena, Jaypee Brothers Medical Publishers Pvt. Ltd.*
- *Textbook Of Medical Biochemistry By Godkar P.B And Godkar D.P, Bhalani Publishing House*
- *Principles and Techniques in Practical Biochemistry By Teitz, Elsevier*
- *Practical Biochemistry by Gupta R. C and Bhargava. S, Cbs Publisher & Distributors PVT. LTD*

SEMESTER 4th

Course Title: Principles of Anesthesia	L	T	P	C
Course Code: BOA4250	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Define anesthesia and its types: general, regional, and local anesthesia.
2. Understand the history and evolution of anesthesia in medical practice.
3. Describe the role of the anesthetist in perioperative patient care.
4. Identify the components and functioning of an anesthesia machine.
5. Explain the importance of oxygen delivery systems, ventilators, and circuit systems.

Course Contents**UNIT-I****10 Hours**

Medical gas supplies a Compressed gas cylinder, Color coding, Cylinder valves; pin index. Gas piping system, Recommendations for piping system, Alarms & safety devices. Scavenging of waste anesthetic gases

UNIT-II**10 Hours**

Anesthesia machine, Hanger and yoke system, Cylinder pressure gauge, Pressure regulator, Flow meter assembly, Vaporizers - types, hazards, maintenance, filling and draining, etc. Face masks & Airway laryngoscopes, Types, sizes, Endotracheal tubes - Types, sizes. Cuff system, Fixing, removing and inflating cuff, checking tube position, complications

UNIT-III**15 Hours**

Breathing system, General considerations: humidity & heat b. Common components - connectors, adaptors, reservoir bags, Capnography, Pulse oximetry, Methods of humidification, Classification of breathing system, Mapleson system - a b c d e f h. Jackson Rees system, Bain circuit, Non rebreathing valves - Ambu valves, The circle system

UNIT-IV**10 Hours**

Anesthesia ventilator and working principles. Monitoring, Electrocardiography (ECG), Pulse oximetry (SpO₂), Temperature- central and peripheral, End tidal carbon dioxide (EtCO₂), Anesthesia gas monitoring, Non-invasive blood pressure (NIBP) and Invasive blood pressure (IBP), Central venous pressure (CVP), PA Pressure, LA Pressure & cardiac output, Anesthesia depth monitor, Neuromuscular transmission monitor

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Readings:

- *"Miller's Anesthesia" – Michael G. Mythen, Lorraine S. Mythen, Ronald D. Miller*
- *"Basics of Anesthesia" – Ronald D. Miller, Manuel C. Pardo*
- *"Stoelting's Pharmacology and Physiology in Anesthetic Practice" – Pamela Flood, James P. Rathmell, Steven Shafer*
- *"The Difficult Airway: An Atlas of Tools and Techniques" – David B. Glick, Richard M Cooper*

Course Title: Operation Theater Technology	L	T	P	C
Course Code: BOA4251	4	0	0	4

Total Hours 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Explain the roles and responsibilities of an operation theater (OT) technologist in the surgical team.
2. Understand team coordination between surgeons, anesthetists, nurses, and technicians.
3. Demonstrate professional ethics and communication skills in a surgical environment.
4. Identify different types of operation theaters (e.g., general surgery, orthopedic, cardiac, neurosurgery).
5. Understand OT zoning (clean, sterile, and restricted areas) for infection control.

Course Contents

UNIT-I

15 Hours

Introduction to Surgical Patient: Preoperative, intraoperative, and postoperative care, Importance of asepsis in patient preparation, Positioning of the surgical patient based on procedure

Instruments Used for Preparing the Surgical Patient: Skin preparation instruments. Draping materials and techniques. Incision Making Instruments: Types of surgical scalpels and blades, Selection and handling of scalpel blades, Disposable vs reusable scalpels

Haemostatic Instruments: Hemostats and their classifications, Artery forceps, Retractors: Types of retractors (Self-retaining and Hand-held), Commonly used retractors (Langenbeck, Balfour, Deaver, Gelpi). Dissecting Forceps: Tissue forceps vs. non-toothed forceps, Common dissecting forceps

UNIT-II

15 Hours

Surgical Scissors: Classification of surgical scissors, Mayo scissors, Metzenbaum scissors, Iris scissors, Uses and handling of scissors in different surgeries

Tissue-Holding Forceps: Allis tissue forceps, Babcock forceps, Doyen forceps, Usage in tissue manipulation

Wound Closure and Sutures, Classification of sutures (Absorbable vs. Non-absorbable), Types of suturing techniques (Interrupted, Continuous, Mattress, Subcuticular), Selection of suture material based on the procedure

Surgical Needles and Needle Holders: Types of surgical needles (Taper, Cutting, Reverse cutting, Blunt), Common needle holders (Mayo-Hegar, Olsen-Hegar, Gillies)

Modern Techniques of Wound Closure: Staplers and their uses, Adhesive tapes and skin glue, Use of synthetic meshes for hernia repair, Laser and laparoscopic wound closure techniques

UNIT-III

15 Hours

Drains and Their Purpose: Types of surgical drains (Passive vs. Active drains), Common drains used in surgery (Penrose, Jackson-Pratt, Hemovac), Indications and removal techniques. Thyroid Surgical Instruments: Special instruments used in thyroid surgery (Lahey forceps, Green retractor, Nerve stimulator), Precautions in thyroid surgery

Bowel Surgical Instruments: Instruments for bowel resection and anastomosis, Staplers and gastrointestinal clamps. Biliary Tract Surgical Instruments: Common instruments used in gallbladder and liver surgeries, Stone forceps, Cholangiogram catheter, Gallbladder trocar

UNIT-IV

15 Hours

Urological Surgical Instruments: Cystoscopy instruments, Resectoscope, Lithotrite, Catheters and stents used in urological procedures

Orthopedic Instruments: Bone cutting instruments, Bone holding forceps, Plating and nailing instruments. Rubber Instruments: Catheters, Drains, Endotracheal tubes, Tubing for suction and oxygen delivery

Instruments Used for ENT Surgeries: Tonsillectomy instruments (Tonsil forceps, Adenotome), Nasal surgery, Otology instruments (Ear speculum, Rosen knife)

Ophthalmological Instruments: Cataract surgery instruments, Keratoplasty and retinal surgery instruments

Gynecological and Obstetrical Instruments: Forceps delivery instruments (Simpson forceps, Kielland forceps), Uterine dilators and curettes (Hegar

dilators, Sim's curette), Laparoscopic instruments for gynecological procedures

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Readings:

- *"Berry & Kohn's Operating Room Technique" – Nancymarie Phillips*
- *"Fundamentals of Operating Room Nursing" – Barbara J. Gruendemann & Sandra Stonehocker*
- *"Microbiology and Infection Prevention for Health Professionals" – Karen Kearns*
- *"Clinical Anesthesia Procedures of the Massachusetts General Hospital" – Richard M. Pino*

Course Title: Surgical Equipment & Technology	L	T	P	C
Course Code: BOA4252	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Explain the principles, design, and functions of various surgical equipment.
2. Understand the classification of surgical instruments and devices based on usage.
3. Demonstrate knowledge of materials used in surgical instruments, including stainless steel, titanium, and disposable plastics.
4. Explain and apply principles of sterilization (autoclaving, ethylene oxide, plasma sterilization).
5. Demonstrate infection control techniques in handling surgical equipment.

Course Contents

UNIT-I

10 Hours

Sterilization & disinfections, Methods of Sterilization- Physical & Chemical, New Methods of Sterilization, Principles of autoclaving, Fumigation of O.T. General surgical, principles & instruments. The surgical patient, operation room techniques Instruments used for preparing surgical instruments trolley- cheatles forceps, rampley's sponge holding forceps, mayo's towel clip, Esmarch's bandage, tourniquet, pneumatic tourniquet.

UNIT-II

10 Hours

Incision making method & Instruments-bard parker knife handle, major abdominal incision, Classification of Instruments. Artery forceps & their types, Kocher's forceps, tissue forceps, electric cautery. Retractions- single hook retractors, Cat paw retractor, Czerny's retractor, nerve hook retractor, Morri's retractors, Devers retractors, Doyen's Retractor. Self-retaining retractors.

UNIT-III

10 Hours

Wound management & closure: Scissors & its types, disinfectants, dressing procedure, different types of bandages, surgical needle & needle holders, types of suture materials. Types of suturing. Modern wound closing techniques – Adhesive tape, Glue, Staples etc.

UNIT-IV

15 Hours

Suction apparatus in surgery, Surgical instruments used for Surgery, Positioning of patient for surgery- Supine, Trendelenburg, Ant

Trendelenburg, Lateral, Prone, Sitting. Common surgical procedures in surgery, I/V fluid administration.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Readings:

- *"Surgical Instrumentation: An Interactive Approach" – Nancymarie Phillips*
- *"The Biomedical Engineering Handbook" – Joseph D. Bronzino*
- *"Perioperative Infection Prevention" – Kateryna Kon & Mahmoud Ghannoum*
- *"Intraoperative Imaging in Neurosurgery" – K. H. Widmann*

Course Title: Biochemistry & Pathology	L	T	P	C
Course Code: BOA4253	4	0	0	4

Total Hours 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Explain the structure, function, and metabolism of biomolecules (carbohydrates, proteins, lipids, nucleic acids).
2. Understand enzyme kinetics, mechanisms of enzyme action, and factors affecting enzyme activity.
3. Describe metabolic pathways (glycolysis, TCA cycle, oxidative phosphorylation) and their clinical relevance.
4. Explain the role of vitamins and minerals in biochemical reactions
5. Understand hormonal regulation of metabolism, including insulin, glucagon, and thyroid hormones.

Course Contents

UNIT-I

15 Hours

Nomenclature of compounds containing halogen, alcohols and phenols. Ethane, Propane, Ether, aldehydes, Ketones, Carboxylic acid, Cyanides Isocyanides, Nitrogen compounds and amines. Nature of radiation and radioactive substances. Catalysis, Amino-acids, peptides, proteins and enzymes. Haemoglobin, blood and respiration 6. Vitamins and hormones 7. Carbohydrate metabolism 8. Brief knowledge about "Disturbances of carbohydrate metabolism, glucose tolerance test, diabetic ketosis, insulin tolerance, abnormal sugar in urine".

UNIT-II

15 Hours

Protein metabolism, Disturbances of protein and nitrogen metabolism Fat metabolism, its disorders, ketosis and high plasma cortisol. Disorders of liver and bilirubin metabolism, plasma bilirubin. Liver function test. Calcium, phosphorous, sodium and potassium in the body, their significance and general precautions. Renal function tests. Disturbance in water and sodium metabolism, Acid-base equilibrium. Blood gases

UNIT-III

15 Hours

Cellular adaptation, Cell injury & cell death. Introduction to pathology Overview: Cellular response to stress and noxious stimuli. Cellular

adaptations of growth and differentiation Overview of cell injury and cell death. Causes of cell injury. Mechanisms of cell injury. Reversible and irreversible cell injury. Examples of cell injury and necrosis. Inflammation. General features of inflammation Acute inflammation Chemical mediators of inflammation Chronic inflammation.

UNIT-IV

15 Hours

Immunity disorders. General features of the immune system Disorders of the immune system Hyper sensitivity reaction – I, II, III, IV Infectious diseases. General principles of microbial pathogenesis Viral infections – HBV, HCV, HIV, CMV Bacterial infections Staphylococci, /streptococci, E.Coli, Salmonella, Tuberculosis. Fungal infections, Parasitic infections, TORCH infection

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Books: -

- *U. Satyanarayan and U.Chakrapani, Biochemistry, Elsevier*
- *M N Chatterjee and R. Shinde, Text book of Medical Biochemistry, Jaypee Brothers.*
- *Harshmohan, Textbook of Pathology, 7th edition, Jaypee Publications.*
- *Robbins, Text book of Pathology, 3rd edition, Elsevier Publications.*

Course Title: Principles of Anesthesia Lab	L	T	P	Cr.
Course Code: BOA4254	0	0	2	1

Total Hours 30 hrs

Learning Outcomes: On the completion of the course, the students will able:

1. Define anesthesia and describe its components (analgesia, amnesia, muscle relaxation, hypnosis).
2. Explain the pharmacokinetics and pharmacodynamics of anesthetic agents.
3. Define anesthesia and describe its components (analgesia, amnesia, muscle relaxation, hypnosis).
4. Explain the pharmacokinetics and pharmacodynamics of anesthetic agents.
5. Perform bag-mask ventilation, endotracheal intubation, and use of supraglottic airway devices.

Course Content

List of practical's/ Experiment

30 hours

1. Definition and historical background
2. Components of general anesthesia (analgesia, hypnosis, muscle relaxation)
3. Anesthesia machine overview and pre-use check
4. Patient evaluation (ASA classification, Mallampati score)
5. Preoperative fasting guidelines
6. Drug interactions and allergies
7. Basic and advanced airway management
8. Bag-mask ventilation and intubation techniques
9. Supraglottic airways (LMA) and video laryngoscopy
10. Difficult airway algorithms
11. Induction agents (Propofol, Etomidate, Ketamine)
12. Inhalational anesthetics (Sevoflurane, Isoflurane)
13. Neuromuscular blockers (Rocuronium, Succinylcholine)
14. Opioids and adjuvants (Fentanyl, Dexmedetomidine)
15. Reversal agents (Sugammadex, Naloxone)
16. Standard ASA monitoring techniques
17. Capnography and ventilatory parameters
18. BIS monitoring and neuromuscular blockade monitoring
19. Hypotension, bradycardia, tachycardia
20. Anaphylaxis and allergic reactions

21. Malignant hyperthermia and its treatment

Course Title: Surgical Equipment and Technology Lab	L	T	P	Cr.
Course Code: BOA4255	0	0	2	1

Total Hours 30 hrs

Learning Outcomes: On the completion of the course, the students will be able:

1. Identify and describe the function of common surgical instruments and equipment.
2. Demonstrate proper handling, assembly, and maintenance of surgical instruments.
3. Understand the principles of electrosurgery, laser surgery, and robotic-assisted surgery.
4. Apply sterilization and disinfection protocols for surgical equipment.
5. Operate and troubleshoot essential surgical technologies (e.g., anesthesia machines, laparoscopic systems).

Course Content

List of practical's/ Experiment

30 hours

1. History and evolution of surgical instruments
2. Classification of surgical instruments (cutting, grasping, retracting, suturing)
3. Importance of ergonomics in surgical instrument design
4. Hemostatic and suturing instruments
5. Orthopedic, neurosurgical, and microsurgical instruments
6. Monopolar and bipolar electrosurgery
7. Safety precautions and complications (burns, stray energy)
8. Troubleshooting electrosurgical units
9. Principles of minimally invasive surgery (MIS)
10. Components of a laparoscopic system (trocars, insufflators, cameras)
11. Cleaning and maintenance of endoscopic instruments
12. Basics of robotic-assisted surgery (Da Vinci system)
13. Role of AI in image-guided surgery and automation
14. Advantages and limitations of robotic systems

Course Title: English for Research Writing	L	T	P	Cr.
Course Code: BOA4256	2	0	0	2

Total Hours 30 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Understand the structure and conventions of academic research writing and use appropriate academic vocabulary.
2. Critically analyze and synthesize information from research articles.
3. Write different sections of a research paper, including abstracts, introductions, methods, results, and discussions.
4. Format and cite sources accurately using recognized citation styles (e.g., APA, Vancouver).
5. Students will be able to apply academic writing conventions, including appropriate use of citations, referencing, and academic tone, to produce high-quality research papers.

Course Content

Unit I

7 Hours

Foundations of Academic Writing and Reading

1. Introduction to academic writing: purpose, audience, and style.
2. Understanding the structure of a research article.
3. Developing critical reading skills: skimming, scanning, and in-depth analysis.
4. Identifying and evaluating sources of information.
5. Introduction to academic integrity and plagiarism.

Unit II

7 Hours

Grammar and Vocabulary for Scientific Communication

- Review of essential grammar: verb tenses, subject-verb agreement, and sentence structure.
- Use of passive voice and nominalization in scientific writing.
- Building academic vocabulary: roots, prefixes, and suffixes.
- Medical terminology: definitions and usage.
- Hedging and boosting: expressing certainty and uncertainty.

Unit III**7 Hours**

Writing the Research Paper

- Writing abstracts: summarizing key findings.
- Writing introductions: establishing the research context and purpose.
- Writing methods: describing the research design and procedures.
- Writing results: presenting data and findings
- Writing discussions: interpreting and analyzing results.
- Writing case reports.

Unit IV**9 Hours**

Referencing and Presentation

- Introduction to citation styles: APA and Vancouver.
- Creating and formatting references and bibliographies.
- Designing effective tables and figures.
- Revision and editing techniques.
- Introduction to the publication process.
- Basics of research presentation.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- Swales, J. M., & Feak, C. B. (2012). *Academic writing for graduate students: Essential tasks and skills*. University of Michigan Press.
- Day, R. A., & Gastel, B. (2011). *How to write and publish a scientific paper*. Cambridge University Press.
- Pechenik, J. A. (2016). *A short guide to writing about biology*. Pearson.
- American Psychological Association. (2020). *Publication manual of the American Psychological Association* (7th ed.).
- International Committee of Medical Journal Editors. (ICMJE). (Various years). *Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals*. Available at: www.icmje.org
- O'Connor, M. (1991). *Writing successfully in science*. HarperCollins Academic.
- Jordan, R.R. (1997). *English for Academic Purposes: A guide and resource book for teachers*. Cambridge University Press.

Course Title: Indian Education	L	T	P	Cr.
Course Code: IKS0002	2	0	0	2

Total Hours 30 hrs

Learning Outcomes: On the completion of the course, the students will able:

1. Understand the Indian Education Pre-Vedic and Post Vedic Period
2. Critically analyse the Paravidhya and Apravidhya in Indian education
3. Examine the methods of Vedas, Jainisim and Bhodhsim Education
4. Development the curriculum according to Vedas, Jainisim and Bhodhsim
5. Deeper knowledge in subjects like mathematics, science, history, and languages.

Course Content

Unit-I

7 Hours

Religion and Philosophy in India: Ancient Period: Pre-Vedic and Vedic Religion, Buddhism and Jainism, Indian philosophy – Vedanta and Mimansa school of Philosophy

Unit-II

7 Hours

Paravidya: Relation between God and Self and Aparavidya: Vedas, Vedangas, Rituals, Astronomy, Ithihasas, Puranas, Ethics and Military sciences etc.

Unit-III

8 Hours

Methods of teaching: Vedic Education: - Saravana, Manana, Nididhyasana and Intuition/revelation Jainisim – Matigyan, saruti Gyan, Avvidhiyagyan, Man: Paryav, Kaveleye

Bhodhsim- Direct and application Method, Lecture Method, Practice Method, Knowledge through conversation, Questioner answer Method

Unit-IV

8 Hours

Vedas- Mantel Development, Physical Development and Seprulity development, Jainisim- Dravye, Astikay and Anistakay

Bhodhsim- four Arya Truth (Shabad Vidhya, Chikitasya Vidhya and Shilpasan Vidhya, Hetu Vidhya and Adhyatam Vidhya

Transactional Mode: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Readings:

- Chaudhuri, Kirti N.: *Trade and Civilisation in the Indian Ocean*, CUP, Cambridge, 1985.
- Malekandathil, Pius: *Maritime India: Trade, Religion and Polity in the Indian Ocean*, Primus
- McPherson, Kenneth: *The early Maritime Trade of the Indian Ocean*, in: *ib.: The Indian*
- *Ocean: A History of People and The Sea*, OUP, 1993, pp. 16-75.
- Christie, J.W., 1995, *State formation In early Maritime Southeast Asia*, BTLV
- Christie, J.W., 1999, *The Banigrama in the Indian Ocean and the Java sea during the early*

Course Title: Obstetrics and Gynecology	L	T	P	C
Course Code: BOA4258	4	0	0	4

Total Hours 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Describe the structure and function of the female reproductive system.
2. Explain the hormonal regulation of the menstrual cycle and its clinical implications.
3. Understand the physiological changes in pregnancy, labor, and postpartum.
4. Explain prenatal care, including routine screening, antenatal checkups, and fetal development assessment.
5. Identify high-risk pregnancies and manage conditions such as gestational diabetes, preeclampsia, and multiple gestations.

Course Contents

UNIT-I

15 Hours

Anatomy & Physiology of female Reproductive organs, Gynecological examination. OBSTETRICS Amenorrhea, Physiology of Pregnancy, Normal delivery, forceps delivery, Twin pregnancy. Fetal Presentations. Ectopic pregnancy, Complications related to pregnant women - Supine hypotension syndrome of pregnancy, Mendelson syndrome of pregnancy, Eclampsia/Pre-eclampsia, PPH.

UNIT-II

15 Hours

Birth control methods & Procedures, Medical termination of pregnancy. Instruments & Techniques of MTP GYNECOLOGY: Clinical methods in gynaecological examination Common diseases of vulva, vagina, Disorders of menstruation, Various operative positions. Disorders of female reproductive system - endometriosis, myoma formation, tubal blockade, cyst formation, abnormal menstruation, STD's

UNIT-III

15 Hours

Normal Labor: Normal labor and delivery, Intrapartum fetal monitoring, Induction of labor, Obstetric Analgesia and Anesthesia, Abnormal Labor: Abnormal uterine action in labor, Abnormal labor patterns, prolonged labor,

obstructed labor, Dystocia. Complications of the third stage of labor, Injuries to birth canal.

UNIT-IV

15 Hours

Diagnostic procedures in gynae and obstrutors - Culdoscopy, Hysteroscopy, Endometrial tissue biopsy, Surgical procedures - Incisions given in gynae procedure, episiotomy, D&C, D&E, MTP, MRP, Caesarean section, tubal ligation, abdominal and vaginal hysterectomy, myomectomy, oophorectomy. Lap. Assisted vaginal hysterectomy, Tubectomy. Instruments used in gynae and obstetrics.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Readings:

- *"Surgical Instrumentation: An Interactive Approach" – Nancymarie Phillips*
- *"The Biomedical Engineering Handbook" – Joseph D. Bronzino*
- *"Perioperative Infection Prevention" – Kateryna Kon & Mahmoud Ghannoum*
- *"Intraoperative Imaging in Neurosurgery" – K. H. Widmann*

Course Title: Basic Procedures and Techniques	L	T	P	Cr.
Course Code: BOA4259	4	0	0	4

Total Hours: 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Know the use of various types of emergency drugs, their dosage and effects.
2. Understand the action of drugs on the neuromuscular system, cardiovascular system.
3. Application of Bicarbonate, calcium, potassium in patient care.
4. Understand the mode of action of pain killer drugs and their effects.

Course Contents

UNIT-I

15 Hours

I.V. Cannulation Sizes, Color Coding, Technique of I.V. cannulation Preparation of I.V. drip Types of fluids Precaution during IV cannulation Central Venous Catheterization and CVP • Role, Types, sizes, Locations Positions, Technique, Precautions Complications Arterial Cannulation Significance, Locations.

UNIT-II

15 Hours

Types, sizes Techniques Complications Intubation Technique of endotracheal intubation Insertion of SGADs (LMA, I -Gel etc) Cuff inflation and pressure difficult intubation kit Sellick maneuver, BURP Technique 5. Bandaging and Splinting Types of bandages and various techniques Scalp bandage, Figure of, Bandages of Eye Ear Splinting Techniques, Use of Splints / Crape Bandage Pressure Points, Emergency Tourniquet Drainage of Abscess

UNIT-III

15 Hours

Cleaning Incision, Drainage Bandaging. Foley Catheter Types, sizes, Insertion Technique Sterile precautions. Nasogastric Tube Size, uses Techniques of Insertion. Face Masks & Airways, ETT, Laryngoscopes, CPR Types of masks: Open and closed Technique of holding Anesthesia mask Airways- Types, Sizes, insertion technique Laryngoscopes- Types, Parts

UNIT-IV**15 Hours**

Endotracheal tubes – Types, sizes, Specialized ETT, Double lumen tubes (DLT), bronchial blockers Supraglottic Airway Device (SGADs): Types, sizes Checking tube position, complications Difficult Intubation Trolley / Tray Types of Oxygen masks Basic CPR Protocol Drop Factor Drops per min, infusion rate calculation.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *Smith, J. D. (2020). Basic Techniques in Photography. Photography Publishing.*
- *L. M. (2018). Essential Procedures in Surgical Nursing. Medical Publishing.*
- *Williams, R. S. (2021). Fundamentals of Painting: Techniques and Tools. Art Publishing.*

SEMESTER 5th

Course Title: Surgical Procedures	L	T	P	C
Course Code: BOA5300	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Explain the basic principles of surgery, including asepsis, hemostasis, and tissue handling.
2. Differentiate between major and minor surgeries based on complexity and patient risk.
3. Describe the phases of surgery: preoperative, intraoperative, and postoperative care.
4. Recognize and correctly use cutting, grasping, retracting, and suturing instruments.
5. Understand the role of electrosurgical devices, suction units, and hemostatic agents.

Course Contents**UNIT-I****10 Hours**

Integumentary and Minimally Invasive Surgery: Excision (or Destruction) of Skin Lesions, Muscle Biopsy, Excision of Subcutaneous Lipoma, Incision and Drainage of an Abscess, Percutaneous Insertion of Catheters, Breast Surgery: Breast Biopsy, Mastectomy, Excision of Ganglion, Thyroidectomy, Parathyroidectomy.

UNIT-II**10 Hours**

Abdominal Extraintestinal Surgery: Abdominal Laparotomy, Abdominal Laparoscopy, Abdominal Herniorrhaphy, Cholecystectomy; Open & Laparoscopic, Pancreaticoduodenectomy (Whipple Procedure), Hepatic Resection, Splenectomy, Laparoscopic Splenectomy. Gastrointestinal Surgery: Colonoscopy, Sigmoidoscopy, Esophagectomy, Closure of a Perforated Peptic Ulcer, Gastrectomy, Bariatric Surgery, Jejunostomy

UNIT-III**10 Hours**

Appendectomy- Open & Laparoscopic, Colostomy, Haemorrhoidectomy, Anal Fissurectomy, Anal Fistulotomy. Gynaecologic and Obstetric Surgery:

Dilation of the Cervix and Curettage of the Uterus (D&C), Vaginal Hysterectomy, Uterine Myomectomy, Total Abdominal Hysterectomy, Tubal Sterilization, Surgery for Ectopic Pregnancy, Caesarean Section,

UNIT-IV

15 Hours

Genitourinary Surgery: Hypospadias Repair, Epispadias Repair, Urethroplasty, Circumcision, Hydrocelectomy, Orchiectomy, Cystoscopy, Transurethral Resection of the Prostate (TURP), Prostatectomy, Nephrectomy, Orthopaedic Surgery: Open Reduction and Internal Fixation, Arthroscopy, Total Hip Arthroplasty, Total Knee Prosthetic Replacement, Total Ankle Arthroplasty with Prosthetic Joint Replacement.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Books: -

- *Ajay Yadav and Arora, Synopsis of medical instruments, Jaypee.*
- *Raymond Maurice Kirk, Basic Surgical Techniques, ELSEVIOR.*
- *Alexis Thomson, Alexander Miles , Manual of Surgery, Morrison and Gibb*
- *Ajay kumar Agarwal and neelabhaarwal, Surgical instruments, Jaypee.*

Course Title: Anesthesia for Specialty Surgeries I	L	T	P	C
Course Code: BOA5301	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: On successful completion of this course, students will be able to:

1. Analyze anesthetic challenges and perioperative management for cardiac, neuro, and pediatric surgeries.
2. Formulate tailored anesthesia plans for obstetric, trauma, and oncologic surgeries.
3. Evaluate the impact of comorbidities on anesthesia outcomes in specialty surgeries.
4. Integrate advanced monitoring techniques (e.g., TEE, neuromonitoring) into surgical anesthesia practice.
5. Adhere to ethical and safety standards in complex surgical environments.

Course Contents

UNIT I: Cardiac and Thoracic Anesthesia

10 Hours

Anesthetic management for CABG, valve replacement, and thoracic surgeries; pharmacology of inotropes, vasodilators, and anticoagulants; intraoperative transesophageal echocardiography (TEE); managing cardiopulmonary bypass; postoperative complications (e.g., arrhythmias, hemodynamic instability).

UNIT II: Neuroanesthesia

10 Hours

Anesthesia for craniotomies, spinal surgeries, and neurovascular interventions; cerebral physiology and ICP management; use of neuromonitoring (EEG, SSEP); controlled hypotension and hypothermia; postoperative delirium and neurological assessments.

UNIT III: Pediatric and Obstetric Anesthesia

10 Hours

Developmental physiology and pharmacokinetics in children; anesthesia for congenital surgeries and neonatal emergencies; obstetric anesthesia (Csections, eclampsia management); fetal monitoring and uterotonic drugs; neonatal resuscitation protocols (NRP).

UNIT IV: Trauma and Oncologic Surgery Anesthesia

15 Hours

Damage control anesthesia in polytrauma; massive transfusion protocols; anesthetic considerations in burn and head injury patients; oncology

surgeries (cytoreductive, reconstructive); managing chemotherapy-related complications and immunosuppression.

- Emerging Trends and Ethics

Anesthesia for robotic and minimally invasive surgeries; ethical dilemmas (e.g., palliative surgeries, resource allocation); legal frameworks for high-risk procedures; advancements in precision anesthesia and AI-driven monitoring.

Transaction Mode: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Readings:

- Hensley, F. A., et al. *"A Practical Approach to Cardiac Anesthesia."* Lippincott Williams & Wilkins (2023).
- Cottrell, J. E., & Patel, P. *"Cottrell and Patel's Neuroanesthesia."* Elsevier (2022).
- Gregory, G. A., & Andropoulos, D. B. *"Gregory's Pediatric Anesthesia."* Wiley Blackwell (2024).
- Chestnut, D. H., et al. *"Chestnut's Obstetric Anesthesia: Principles and Practice."* Elsevier (2023).
- American Society of Anesthesiologists. *"Guidelines for Trauma Anesthesia."* ASA (2022).

Course Title: Basics of Hospital Skill Learning	L	T	P	Cr.
Course Code: BOA5302	4	0	0	4

Total Hours 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Understand the basic ideas on how to check for Vital Signs of the Patient
2. Learn how to handle the patients and their positioning
3. Learn on the Basics of Nasal-Gastric Tube
4. Learn on Administration of IV, IV and Medication
5. Know about Cleanliness in the Asepsis

Course Contents

UNIT-I 15 Hours

MEASURING VITAL SIGNS: Temperature: Axillaries Temperature, Pulse: Sites of pulse, Measurement, Respiratory, Blood Pressure, Pain: Pain Scale
PHYSICAL EXAMINATION: Observation, Auscultation (Chest), Palpation, Percussion, History Taking

UNIT-II 15 Hours

FEEDING: ENTRAL FEEDING, NG TUBE: Measurement, Procedure, Care, Removal of Nasal-Gastric Tube, Nasal-Gastric Tube Feeding, and Parenteral Nutrition.

MOBILITY AND SUPPORT: Moving and Positioning, range of Motion exercises (Active & Passive) Assisting for Transfer, Application of Restraints

UNIT-III 15 Hours

ADMINISTRATIONS: Oral, Intravenous, Intramuscular, Subcutaneous, Recapping of Syringe, Loading of Drugs, Calculation of Drugs, Venipuncture, IV Infusion, Cannula, Attachment of IV infusion Set, Fluid Collection, Heparin Lock, Maintenance of IV set, Performing Nebulizer Therapy, Inhaler, Oxygen Therapy (Nasal, prongs, nasal Catheter, Venturi Mask, face mask)

UNIT-IV 15 Hours

ASEPSIS: Hand wash Techniques, (Medical, Surgical) Universal Precaution, Protecting Equipments: Using Sterile Gloves, Opening a Sterile package and Establishing a Sterile Field, Sterile Dressing Changes, Surgical Attire ,

Wound Dressing, Suture Removal, Cleaning and Application of Sterile Dressing, Wearing and Removal of personal protective Equipment

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- Scott IA. *Health care system performance and physician training: A review of current problems and future directions. Med J Aust.* 2019;211(1):39-42.
- Wachter RM. *Understanding patient safety. 3rd ed. McGraw-Hill Education; 2017.*
- Leonard M, Graham S, Bonacum D. *The human factor: The critical importance of effective teamwork and communication in providing safe care. Qual Saf Health Care.* 2004;13(Suppl 1):i85-i90.
- World Health Organization. *Patient safety curriculum guide: multi-professional edition. WHO Press; 2011.*
- Centers for Disease Control and Prevention. *Guide to Infection Prevention for Outpatient Settings. CDC; 2016.*

Course Title: Research Methodology and Biostatistics	L	T	P	Cr.
Course Code: BOA5303	4	0	0	4

Total Hours 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Understand the Basics of Research
2. Formulate a Research Problem
3. Study Design & Data Collection
4. Data Management & Analysis
5. Scientific Writing & Publication

Course Contents

UNIT I

15 hours

Introduction to Research: Definition of Research, Types & Methods of research Applied versus Fundamental research, exploratory research, Observational research, Inductive and Deductive approaches; Designing Research protocol: Research Protocol Development, Literature search, Identification of Research problem, Research gap, Research question, Research Hypothesis, Null and Alternative Hypothesis, Study Objectives; Data and types: Types of Data, Primary and Secondary data, Scales of measurement of data- Nominal data, Ordinal, Interval and Ratio scale, Variables and Confounders, Dependent and Independent Variables, Extraneous variable, Control variable.

UNIT II

15 hours

Literature Review: Importance of literature review, Sources of literature: Journals, books, and online databases, Organizing and synthesizing research findings; Research Design: Meaning of Research Design, Need for Research Design, Features of a Good Design, Different Research Designs, Basic Principles of Experimental Designs; Study population: Selecting Cases and Control, Comparison Group, Target population, Matching, Case Definition, Inclusion and Exclusion Criteria; Qualitative vs. Quantitative research methods; Data Collection and analysis : Types and sources of data – Primary and secondary, Methods of collecting data, Concept of sampling and sampling methods – sampling frame, sample, characteristics of good sample, simple random sampling, purposive sampling, convenience sampling, snowball sampling.

Unit III**15 hours**

Statistics: Measures of central tendency: Mean, median, and mode, Measures of dispersion: Range, variance, and standard deviation, Frequency distributions and histograms, Data visualization: Bar charts, pie charts, and box plots; Probability and Probability Distributions: Basic probability concepts, Probability distributions: Normal distribution, binomial distribution, and Poisson distribution, Law of large numbers and central limit theorem.

Unit IV**15 hours**

Chi-square test for independence and goodness of fit, One-way and two-way analysis of variance (ANOVA), Post-hoc tests following ANOVA; Regression Analysis: Simple linear regression, Multiple linear regression, Model assumptions and diagnostics, Logistic regression (binary outcomes), Poisson regression (count data); Biostatistics for Clinical Trials: Design and analysis of clinical trials, Randomization techniques, Statistical monitoring of trials, Regulatory considerations (e.g., FDA guidelines).

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *Creswell, J.W. & Creswell, J.D. – Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*
- *Hulley, S.B., Cummings, S.R., Browner, W.S., et al. – Designing Clinical Research*
- *Kothari, C.R. & Garg, G. – Research Methodology: Methods and Techniques*
- *Bland, M. – An Introduction to Medical Statistics*
- *Rosner, B. – Fundamentals of Biostatistics*
- *Dawson, B. & Trapp, R.G. – Basic & Clinical Biostatistics*
- *Daniel, W.W. & Cross, C.L. – Biostatistics: A Foundation for Analysis in the Health Sciences*
- *Zhou, X-H., Obuchowski, N.A., McClish, D.K. – Statistical Methods in Diagnostic Medicine*

Course Title: Surgical Procedures Lab	L	T	P	Cr.
Course Code: BOA5304	0	0	2	1

Total Hours 30 hrs

Learning Outcomes: On the completion of the course, the students will able:

1. Demonstrate knowledge of sterile techniques and surgical safety protocols.
2. Identify and use common surgical instruments correctly.
3. Perform basic surgical skills, including suturing, knot tying, and incision techniques.
4. Apply principles of tissue handling and hemostasis.
5. Assist in surgical procedures following standard operative techniques.

Course Content

List of practical's/ Experiment

30 hours

1. History and evolution of surgical techniques
2. Surgical team roles and responsibilities
3. OR layout and zoning
4. Sterile techniques and surgical hand scrubbing
5. Gowning and gloving procedures
6. Classification of surgical instruments
7. Proper handling and passing of instruments
8. Electrosurgical units and their use
9. Biopsy techniques (punch, incisional, excisional)
10. Abscess drainage and wound debridement

Course Title: Anaesthesia for Specialty Surgeries I Lab	L	T	P	Cr.
Course Code: BOA5305	0	0	2	1

Total Hours 30 hrs

Learning Outcomes: On the completion of the course, the students will able:

1. Describe the principles of anesthesia management for specialty surgeries, including cardiovascular, neurosurgical, obstetric, and pediatric procedures.
2. Explain the physiological and pharmacological considerations for anesthesia in specialty surgical cases.
3. Identify anesthetic agents, techniques, and monitoring requirements specific to different specialty surgeries.
4. Administer and manage anesthetic agents safely for patients undergoing specialty surgeries.
5. Monitor and interpret vital signs, neuromuscular blockade, and depth of anesthesia during specialty procedures.

Course Content

List of practical's/ Experiment

30 hours

1. Patient evaluation for specialty surgeries (cardiac, neuro, pediatric, etc.).
2. Airway assessment and difficult airway management techniques.
3. Preoperative medication planning and optimization.
4. Endotracheal intubation using video laryngoscopy and fiberoptic bronchoscopy.
5. Supraglottic airway devices in specialty cases (LMA, i-gel).
6. Cricothyroidotomy and emergency airway techniques.
7. Induction and maintenance of anesthesia for neurosurgery (brain tumors, spine procedures).
8. Anesthetic management for cardiac surgeries (CABG, valve replacement).
9. Pediatric anesthesia considerations and ventilatory strategies.
10. Anesthesia for trauma and emergency surgeries.

Course Title: Basic Intensive Care	L	T	P	C
Course Code: BOA5306	4	0	0	4

Total Hours 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Explain the principles of critical care medicine, including the criteria for ICU admission.
2. Understand the organization and function of the ICU, including multidisciplinary teamwork.
3. Identify common life-threatening conditions requiring intensive care management.
4. Perform basic airway management techniques, including endotracheal intubation and tracheostomy care.
5. Understand the principles of mechanical ventilation, including modes, settings, and weaning.

Course Contents

UNIT-I

15 Hours

Introduction to Intensive Care Unit (ICU): Definition and importance of ICU, Evolution and development of critical care medicine, Basic functioning and objectives of ICU.

Types of ICUs and Their Differences: Medical ICU (MICU), Surgical ICU (SICU), Neurological ICU (Neuro-ICU), Stroke ICU, Pediatric ICU (PICU) and Neonatal ICU (NICU), Cardiac ICU (CCU), Burn ICU, Differences between Open and Closed ICUs, Advantages and disadvantages of different types of ICUs

UNIT-II

15 Hours

ICU Protocols for Various Procedures: Admission and discharge criteria for ICU patients, Infection prevention and control protocols, Medication administration and dosage monitoring, Patient monitoring protocols, Emergency resuscitation protocols, Documentation and record-keeping in ICU

Role and Responsibilities of ICU Technologists: Monitoring and assisting in critical care procedures, Operating and maintaining ICU equipment, assisting physicians and nurses in patient care, Infection control responsibilities, Ensuring the safe use of medical devices, Ethical considerations and patient confidentiality in ICU.

UNIT-III

15 Hours

Defibrillator: Function and working principle, Types: Manual, Automatic, Biphasic defibrillators, Indications and usage in cardiac emergencies, Safety measures while using defibrillators, Portable X-ray (C-arm) and Radiation Safety, Principles of portable X-ray in ICU, Use of C-arm in ICU procedures, Radiation hazards and safety protocols, Lead aprons and radiation shielding techniques, Ultrasound in ICU, Infusion Pumps, Nebulizers.

UNIT-IV

15 Hours

Multi-Parameter Monitor: Functions and features, ECG, SpO₂, Blood pressure, and temperature monitoring, Alarm settings and troubleshooting, Special ICU Beds, ABG (Arterial Blood Gas) Machine, Interpretation of ABG results (pH, PaO₂, PaCO₂, HCO₃⁻), ECG Machine, Principles and uses of ECG in ICU, Ventilators, Types of ventilators (Invasive, Non-invasive, High-frequency ventilators), DVT Pump (Deep Vein Thrombosis Pump), Function and importance in ICU, Prevention of deep vein thrombosis in immobile patients, Application and operation of DVT pumps.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Books: -

- *Namita Padvi, Amit Padvi, Drugs in anesthesia and critical care, CBSPDP*
- *Paul L. Marino, The ICU book, Wolters Kluwer*
- *Rajesh Chawla, Subhash Todi, ICU protocols, Springer*

Course Title: Medical Diseases Influencing Choice of Anesthesia	L	T	P	Cr.
Course Code: BOA5307	4	0	0	4

Total Hours: 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Learn the application of anesthetic medications in Various Heartdiseases.
2. Understand Respiratory diseases such as Chronic Obstructive Pulmonary Disease and Acute
3. Understand Respiratory Failure in renal diseases, diseases of Liver and endocrine disorders and In metabolic Diseases
4. Apply the knowledge related to drugs, calculations of anesthetic medications in different cardiovascular, respiratory and renal diseases.

Course Contents

UNIT-I

15 Hours

Ischemic Heart Disease: Risk factors: Medications, Acute MI, and Anesthesia for IHD cases. Post op management Valvular Heart Disease: Mitral stenosis: Anesthetic problems, Aortic regurgitation Hypertension: Drugs Anaesthesia for Hypertension. Hypertensive Crises. Complications

UNIT-II

15 Hours

Respiratory Diseases: COPD, Bronchiectasis, Asthma, Pneumonia, Acute Respiratory Failure, Tuberculosis Diseases of CNS- Cerebral Edema & Its Management, Ocular Trauma, Meningitis, Encephalitis.

UNIT-III

15 Hours

Diseases of Liver and Biliary Tract-Liver Functions, Liver Function Tests, Hepatitis, Jaundice, Types, Cirrhosis; Hepatorenal Syndrome Renal Disease: Functions of Kidney, Kidney Function, tests, Renal Failure, Anesthesia for renal failure patients (Acute and Chronic), Urinary Tract Infection

UNIT-IV

15 Hours

Endocrine Disease: Diabetes Mellitus, Thyroid Dysfunction – Thyrotoxicosis, Hypothyroidism, Adrenal Gland Dysfunction, Diabetes Insipidus. Obesity, Anemia, Iron Deficiency Anemia Head Injury: Classification, Mechanism of Head Injury, SDH, EDH, SAH

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- George Mathews:- *Handbook Medicine* Lee Synosis: *Anaesthesia Handbook*.
- Stoelting, R. K., & Hillier, S. C. (2019). *Anesthesia and CoExisting Disease* (7th ed.). Elsevier.
- Dripps, R. D., & Eckenhoff, J. E. (2016). *Introduction: The Patient with Systemic Disease*. In Dripps/ Eckenhoff/ Vandam's *Introduction to Anesthesia: The Principles of Safe Practice* (6th ed., pp. 1-17). Lippincott Williams & Wilkins.
- Longnecker, D. E., Brown, D. L., Newman, M. F., & Zapol, W. M. (2017). *Chapter 5: Coexisting Disease*. In *Anesthesiology* (3rd ed., pp. 93-109). McGraw-Hill Education.
- Pino, R. M., Aliaga, L., & Cassorla, L. (2016). *Coexisting Disease: The Pediatric Patient*. In *Anesthesia and Perioperative Care for Organ Transplantation* (1st ed., pp. 57-69). Springer.

Course Title: Regional Anesthesia Techniques	L	T	P	C
Course Code: BOA5308	4	0	0	4

Total Hours 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Define regional anesthesia and its role in surgical and pain management.
2. Differentiate between central neuraxial blocks (spinal, epidural) and peripheral nerve blocks.
3. Explain the physiological and pharmacological principles of regional anesthesia.
4. Recognize the clinical applications of regional anesthesia in various surgeries.
5. Identify contraindications (e.g., coagulopathy, infection at injection site, patient refusal).

Course Contents

UNIT-I

15 Hours

Introduction and classification- Local Block, Peripheral Nerve Block, Central Neuraxial Block- Drugs used in Regional Anaesthesia. Needles used in Regional Anaesthesia. Use of Local Block in combination with General Anesthesia & its advantages.

UNIT-II

15 Hours

Considerations during Regional Anesthesia, Systemic effect of Local Anesthetics Toxicity of Local Anesthetics. Individual Agents used, Methods of Local Anaesthesia, Causes of Failure of Local Anaesthesia, Topical Anesthesia- Xylocaine Jelly & EMLA creams.

UNIT-III

15 Hours

Central Neuraxial Blocks: Applied Anatomy, Advantages of CNB over General Anaesthesia, Systemic effects, Spinal Anaesthesia/Block, Intrathecal Block, Saddle Block. Epidural Anaesthesia (Peridural Block) Combined Spinal Epidural Block, Caudal Block, Level of Block Required for common Surgeries.

UNIT-IV

15 Hours

Peripheral Nerve Block- Technique, Blocks in Upper Limb, Blocks in Lower Limb, Blocks in Head & Neck, Blocks in Thorax & Abdomen area. Contraindications of Peripheral Nerve Block.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Readings:

- *G. Smith & A.R. Aitkenhead's, Textbook of Anaesthesia, ELSEVIER.*
- *Ajay Yadav, Short Textbook of Anaesthesia, JP Brothers.*
- *Arun Kumar Paul, Drugs & Equipments in Anaesthetic Practice, Elsevier*
- *S Ahanatha Pillai, A Manual of Anesthesia for Operation Theatre, JP Brothers.*

Course Title: Medicine	L	T	P	Cr.
Course Code: BOA5309	4	0	0	4

Total Hours: 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Obtain an accurate and complete medical history of the patient.
2. Perform complete and organ-system specific examinations, including amental status examination.
3. Recommend and interpret the results of commonly used diagnostic procedures and tests.
4. Recognize Common urinary symptoms- dysuria, pyuria, anuria, oliguria, polyuria

Course Contents

UNIT-I

15 Hours

Common symptoms of diseases –Pain: pathophysiology, clinical types, assessment and management Fever: clinical assessment and management Cough chest pain, dyspnoea, and haemoptysis Oedema, anasarca, ascites Pallor, jaundice Bleeding Anorexia, nausea and vomiting Constipation and diarrhea

UNIT-II

15 Hours

Hematemesis, malena and hematochezia Common urinary symptoms- dysuria, pyuria, anuria, oliguria, polyuria, nocturia, enuresis Body pains and joint pains Headache, seizures, fainting, syncope, dizziness, vertigo Disturbances of consciousness and coma, Weight loss and weight gain

UNIT-III

15 Hours

Immune Response and Infections Approach to infectious diseases – diagnostic and therapeutic principles Immune defence mechanisms Laboratory diagnosis of infections Principles of immunization and vaccine use Immuno deficiency disorders - acquired Immunodeficiency disorders – congenital

UNIT-IV

15 Hours

Cardiovascular system- Clinical examination of the cardiovascular system, major manifestations of cardiovascular disease Respiratory system - Clinical examination of the respiratory system, major manifestations of respiratory

disease Renal and genito-urinary system- Major manifestations of renal and urinary tract disease Liver and biliary tract disease - Viral hepatitis, alcoholism. Endocrinology and metabolism, Diabetes mellitus, Hyper-and hypothyroidism. Disorders of the Immune System, Connective Tissue and Joints Disorder of haemopoiesis - Anemia - iron deficiencies anemia. Types

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- Greenhalgh, T. (2019). *How to Read a Paper: The Basics of Evidence Based Medicine (6th ed.)*. John Wiley & Sons.
- Kumar, P., & Clark, M. (2017). *Kumar and Clark's Clinical Medicine (9th ed.)*. Elsevier.
- Kasper, D. L., Fauci, A. S., Hauser, S. L., Longo, D. L., Jameson, J. L., & Loscalzo, J. (Eds.). (2020). *Harrison's Principles of Internal Medicine (20th ed.)*. McGraw-Hill Education.
- Deakin, C. D., & King, P. (Eds.). (2019). *Advanced Life Support: A Practical Approach (6th ed.)*. Wiley-Blackwell.
- McPhee, S. J., Papadakis, M. A., & Rabow, M. W. (Eds.). (2019). *Current Medical Diagnosis & Treatment 2020*. McGraw-Hill Education.

SEMESTER 6th

Course Title: CSSD Procedures	L	T	P	Cr.
Course Code: BOA6350	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Explain the functions and responsibilities of the Central Sterile Supply Department.
2. Understand the importance of sterilization and infection control in healthcare settings.
3. Identify the workflow of CSSD, from receiving used instruments to dispatching sterile supplies.
4. Differentiate between critical, semi-critical, and non-critical items based on sterilization needs.
5. Identify surgical instruments, endoscopes, and reusable medical devices requiring sterilization.

Course Contents**UNIT-I****10 Hours**

Introduction to CSSD and its Role in Infection Control: Importance of CSSD in hospital settings, Workflow of CSSD: Collection, Cleaning, Packaging, Sterilization, Storage, and Distribution, Principles of Sterilization and Disinfection, Factors affecting sterilization effectiveness, Methods of Sterilization: Physical methods, Chemical methods, Mechanical methods, Methods of Disinfection, Boiling, Chemical disinfection, Alcohol-based disinfection, Surface disinfection techniques.

UNIT-II**10 Hours**

Dry Heat Sterilization, Mechanism and effectiveness, Hot air ovens: Procedure and precautions, Limitations and applications, Wet Heat Sterilization (Autoclaving), Gaseous Sterilization, Ethylene Oxide (EtO) sterilization: Mechanism, applications, and precautions, Formaldehyde sterilization: Uses and hazards, Chemical Sterilization, Sterilization by Radiation, Gamma radiation sterilization, Ultraviolet (UV) sterilization

UNIT-III**10 Hours**

Techniques for Sterilization of Rubber Articles: Laryngeal Mask Airways (LMA), Flexible Optical Bronchoscope (FOB), Endotracheal Tubes (ETT), Laryngoscopes, Anesthesia machines and circuits, Techniques for

Sterilization of Carbonized Articles, Hazards of Sterilization, Chemical exposure risks (EtO, formaldehyde, glutaraldehyde), Fire and explosion hazards, Proper handling of sterilization equipment.

UNIT-IV

15 Hours

Precautions During Sterilization: Correct loading of autoclaves and sterilizers, Handling of sterile instruments, Storage and transport of sterilized materials, Quality Control and Monitoring of Sterilization, Use of sterility indicators (biological, chemical, and mechanical), Record-keeping and documentation in CSSD, Routine maintenance of sterilization equipment. Recent Advances in Sterilization Techniques, Advanced sterilization monitoring systems.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Readings:

- *"Sterilization Technology for the Health Care Facility" – Marimargaret Reichert & Jack H. Young*
- *"Central Sterile Supply Department (CSSD): Concepts, Design, and Practice" – Jitendra Singh*
- *"Infection Control and Management of Hazardous Materials for the Dental Team" – Chris H. Miller*
- *"Medical Instrumentation: Application and Design" – John G. Webster*
- *"Basics in Central Sterile Supply Department" – Kuldeep Singh*

Course Title: Anesthesia for Specialty Surgeries II	L	T	P	Cr.
Course Code: BOA6351	3	0	0	3

Total Hours 45 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Design anesthesia plans for transplant, bariatric, robotic, and ENT surgeries.
2. Manage perioperative challenges in patients with endstage organ failure or rare comorbidities.
3. Integrate advanced monitoring (e.g., ECMO, cerebral oximetry) into practice.
4. Navigate ethical dilemmas in resourcelimited surgical settings.
5. Coordinate multidisciplinary care in hybrid operating rooms and trauma centers.

Course Contents

UNIT I: Transplant Anesthesia

10 Hours

Anesthetic management for liver, kidney, heart, and lung transplants; donor optimization and brain death protocols; immunosuppression pharmacology; intraoperative coagulopathy; postoperative graft dysfunction; ethical issues in organ allocation.

UNIT II: Advanced Neuroanesthesia& Pain Management

10 Hours

Anesthesia for deep brain stimulation, awake craniotomies, and chronic pain interventions (spinal cord stimulators); intraoperative neurophysiological monitoring (MEP, SSEP); postoperative cognitive decline and delirium management.

UNIT III: Bariatric & Robotic Surgery

10 Hours

Physiological challenges in obesity; anesthesia for robotic prostatectomies and gastric bypass; pneumoperitoneum management; prevention of perioperative pulmonary complications; ergonomic challenges in robotic setups.

UNIT IV: ENT & Maxillofacial Anesthesia

15 Hours

Airway management for laryngectomies and tracheal stenosis; shared airway techniques in ENT surgeries; anesthesia for orthognathic and cleft palate repairs; laser safety and airway fire protocols.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Readings:

- *Kang, Y. G. "Anesthesia for Organ Transplantation." Springer (2023).*
- *Doyle, D. J. "Clinical Airway Management." Cambridge (2022).*

Course Title: Research Publication Ethics and IPR	L	T	P	Cr.
Course Code: BOA6352	4	0	0	4

Total Hours 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Define research misconduct (plagiarism, data fabrication, falsification).
2. Recognize ethical guidelines in publishing (ICMJE, COPE).
3. Identify the role of peer review and conflicts of interest
4. Differentiate between copyright, patents, and trademarks.
5. Understand open-access policies and licensing (Creative Commons, PubMed Central).

Course Contents

Unit I

15 Hours

Scientific Writing: Structure of a scientific paper (Title, abstract, introduction, methodology, results, discussion, conclusion); Writing a research proposal: Objectives, methodology, expected outcomes, Academic writing style and language (Clarity, conciseness, and logical flow), Citation and referencing: Understanding various citation styles (APA, MLA, Chicago, etc.), Reference management tools.

Unit II

15 Hours

Plagiarism: Types, plagiarism detection software, Publication misconduct and Publication Ethics, Plagiarism avoiding techniques, regulation of plagiarism in India; Publication Ethics: Integrity and Ethics, Best Practices, Intellectual Honesty & Research Integrity: Scientific Misconducts & Redundant Publications, Conflict of Interest, Publication Misconduct, Violation of Publication Ethics, Authorship and Contributorship; Identification of Publication Misconduct: Fabrication, Falsification and Plagiarism (FFP), Predatory Publishers & Journals.

Unit III

15 Hours

Open Access Publishing: Concept of OER, Concept of open license, Open access publishing, Open access content management; Database and Research Metrics: Indexing Databases, Citation Databases: Web of Science, Scopus, Google Scholar, Metrics: h-index, g-ind, i10 index, Understanding Citation Metrics for Quality Research: Impact & Visualization Analysis; Peer Review and Journal Selection: Understanding the peer-review process, Types

of journals: Open access vs. subscription-based journals, How to select a journal for publication, Writing a cover letter and responding to reviewer comments.

Unit IV

15 Hours

Intellectual Property Rights (IPR): Definition and types of intellectual property (IP): Copyright, patents, trademarks, and trade secrets; The importance of IP in research and innovation, Historical development and international IP laws (e.g., the role of WIPO, TRIPS Agreement); Key IP terms: Patentable inventions, originality, novelty, and industrial applicability; Patents: Overview of the patent system: Types of patents, Steps involved in obtaining a patent: Application, examination, and grant, Patentability requirements: Novelty, non-obviousness, and usefulness, Patent infringement and enforcement; Licensing and Commercialization of IP: Types of IP licenses: Exclusive vs. non-exclusive licenses, Licensing agreements and revenue sharing, Commercialization of research findings: Startups, spin-offs, and patent exploitation, Technology transfer offices: Role in university-based IP commercialization; Patent issues in academic research: Balancing public knowledge with commercial interests, Ethical concerns in patenting research outcomes, Impact of IP laws on collaborative research, IP in publicly funded research.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *International Committee of Medical Journal Editors (ICMJE). Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals. Available at: www.icmje.org*
- *Committee on Publication Ethics (COPE). Ethical Guidelines for Peer Reviewers and Editors. Available at: <https://publicationethics.org/>*
- *Wager E, Kleinert S. Responsible research publication: International standards for authors. Toxicology Letters. 2010; 197(3): 161-168.*
- *Hames I. Peer Review and Manuscript Ethics. The COPE Report 2013; 25-32.*
- *World Intellectual Property Organization (WIPO). Understanding Copyright and Patents. Available at: <https://www.wipo.int/>*
- *Das S. Intellectual Property Rights in Research & Academia. Journal of Academic Ethics. 2020;18(4): 345-358.*

Course Title: CSSD Procedures Lab	L	T	P	Cr.
Course Code: BOA6353	0	0	2	1

Total Hours 30 hrs

Learning Outcomes: On the completion of the course, the students will able:

1. Understand the role of CSSD in maintaining sterile conditions in healthcare settings.
2. Describe the sterilization process from decontamination to storage and distribution.
3. Demonstrate correct handling of medical instruments for cleaning, disinfection, and sterilization.
4. Apply infection control principles to prevent healthcare-associated infections (HAIs).
5. Differentiate between sterilization techniques such as autoclaving, chemical sterilization, and plasma sterilization.

Course Content

List of practical's/ Experiment

30 hours

1. Definition and importance of CSSD
2. Role of CSSD in infection control
3. CSSD workflow: Receiving, Cleaning, Disinfection, Sterilization, Storage, and Distribution
4. Principles of decontamination
5. Manual cleaning vs. automated cleaning (Ultrasonic cleaners, Washer-disinfectors)
6. Selection and use of detergents and enzymatic cleaners
7. Levels of disinfection (low, intermediate, high)
8. Spaulding classification: Critical, Semi-critical, and Non-critical instruments
9. Chemical disinfectants: Glutaraldehyde, Hydrogen peroxide, Peracetic acid
10. Steam sterilization (Autoclaving)
 - Principles of moist heat sterilization
 - Autoclave cycle parameters (temperature, pressure, time)
 - Bowie-Dick test and biological indicators
11. Ethylene Oxide (EtO) sterilization
 - Indications, process, and safety measures
12. Plasma Sterilization (Hydrogen Peroxide Gas Plasma)
13. Dry Heat Sterilization & Radiation Sterilization

- Sterile storage area requirements (temperature, humidity, ventilation)
- FIFO (First In, First Out) principle
- Transportation of sterile items and sterility maintenance
- PPE usage in CSSD
- Safe handling of contaminated and sharp instruments
- Color-coded biomedical waste segregation and disposal

Course Title: Anaesthesia for Specialty Surgeries II Lab	L	T	P	Cr.
Course Code: BOA6354	0	0	2	1

Total Hours 30 hrs

Learning Outcomes: On the completion of the course, the students will be able:

1. Understand anesthesia considerations for specialized surgeries, including neurosurgery, cardiac surgery, and transplant procedures.
2. Demonstrate proficiency in patient assessment, preoperative optimization, and risk stratification.
3. Apply appropriate anesthetic techniques tailored to each surgical specialty.
4. Manage intraoperative complications such as hemodynamic instability, airway challenges, and anesthetic drug interactions.
5. Implement post-anesthesia care strategies, including pain management and prevention of postoperative complications.

Course Content

List of practical's/ Experiment

30 hours

1. Overview of unique challenges in specialized surgeries
2. Preoperative evaluation and optimization
3. Choice of anesthesia technique (General vs. Regional vs. Combined)
4. Intracranial pressure (ICP) management and cerebrovascular autoregulation
5. Anesthetic drugs and their effects on cerebral blood flow
6. Techniques for awake craniotomy and intraoperative neurophysiological monitoring
7. Management of brain tumors, aneurysms, and spinal surgeries
8. Cardiopulmonary bypass (CPB) considerations
9. Heparinization and reversal with protamine
10. Use of transesophageal echocardiography (TEE)
11. Postoperative care and management of cardiac complications
12. One-lung ventilation (OLV) and lung isolation techniques
13. Management of hypoxia and ventilation-perfusion mismatch
14. Anesthetic considerations for video-assisted thoracoscopic surgery (VATS)
15. Pain management strategies, including epidural analgesia
16. Liver transplantation: Management of massive transfusion, coagulation issues, and hemodynamic instability

17. Kidney transplantation: Fluid balance, electrolyte management, and immunosuppressive considerations
18. Lung and heart transplantation: Postoperative graft dysfunction and immunosuppressive therapy

Course Title: Indian Health Science	L	T	P	Cr.
Course Code: IKS0006	2	0	0	2

Total Hours 30 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Understand knowledge of India's traditional health systems
2. Critically analyse India's healthcare policies
3. Understand the patterns, causes, and effects of diseases in India and strategies for prevention and control.
4. Learn about nutrition, sanitation, mental health, and lifestyle diseases like diabetes and cardiovascular disorders, along with preventive healthcare measures.
5. Contribution to disease control and prevention programs.

Course Content

Unit – I

7 Hours

Introduction, Vedic foundations of Ayurveda. Ayurveda is concerned both with maintenance of good health and treatment of diseases.

Unit – II:

8 Hours

Basic concepts of Ayurveda. The three Gunas and Three Doshas, Pancha-mahabhuta and Sapta-dhatu.

The importance of Agni (digestion). Six Rasas and their relation to Doshas. Ayurvedic view of the cause of diseases.

Unit – III:

8 Hours

Dinacharya or daily regimen for the maintenance of good health. Ritucharya or seasonal regimen. Important Texts of Ayurveda. Selected extracts from Astāngahrdaya (selections from Sūtrasthāna) and Suśruta-Samhitā (sections on plastic surgery, cataract surgery and anal fistula). The large pharmacopeia of Ayurveda.

Unit – IV:

7 Hours

Charaka and Sushruta on the qualities of a Vaidya. The whole world is a teacher of the good Vaidya.

Charaka's description of a hospital. Hospitals in ancient and medieval India.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *Park's Textbook of Preventive and Social Medicine – K. Park*
- *Ayurveda: The Science of Self-Healing – Dr. Vasant Lad*
- *Health Sector in India: A Policy Perspective – P. K. Pandey*
- *Essential Readings in Health Policy and Law – Joel B. Teitelbaum & Sara E. Wilensky*

Course Title: Critical Care Equipment and Procedures in ICU	L	T	P	Cr.
Course Code: BOA6356	4	0	0	4

Total Hours 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Define critical care and the role of the ICU in patient management.
2. Explain the importance of monitoring, life-support systems, and emergency protocols in critical care.
3. Identify common ICU conditions, such as sepsis, respiratory failure, and cardiac arrest.
4. Differentiate between invasive and non-invasive ventilation.
5. Demonstrate endotracheal intubation and tracheostomy care.

Course Contents

UNIT-I

15 Hours

MONITORING AND DIAGNOSTIC PROCEDURES IN I.C.U. - Central Venous access. - ECG monitoring. - Invasive hemodynamic monitoring GENERAL CARE OF PATIENT IN I.C.U. - Eye - Bladder Skin - Care of mechanically ventilated patient - Tracheostomy, humidification - Vascular lines - arterial, venous line - Radiography - Physiotherapy - chest physiotherapy

UNIT-II

15 Hours

FLUID BALANCE AND PARENTERAL NUTRITION INFECTIOUS DISEASES IN I.C.U. • Antibiotics in I.C.U. • Oxygen therapy • Mechanical ventilation ACID - BASE DISORDERS CARDIOVASCULAR FAILURE • Inotropic suppo • Vaso dilator drugs

UNIT-III

15 Hours

RENAL FAILURE & LIVER FAILURE HEAD INJURY PRINCIPLES OF TRANSFUSION THERAPY • Whole blood, erythrocyte products • Plasma components Platelets concentrate) Massive transfusion, acute transfusion reactions.

UNIT-IV

15 Hours

VENTILATORS - Principles of working of different ventilators - Volume cycles ventilators. - Time cycle's ventilators - Pressure cycles ventilators - High Frequency ventilators etc. ABG MACHINES - Working - Principles & Uses. REGIONAL ANAESTHETIC TECHNIQUES. - Local anaesthetic technique - Nerve blocks - Spinal Anaesthesia - Epidural anaesthesia Ultra sound guided nerve blocks

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Readings:

- *"The ICU Book" – Paul L. Marino*
- *"Irwin & Rippe's Intensive Care Medicine" – Richard S. Irwin & James M. Rippe*
- *"Principles of Critical Care" – Jesse B. Hall, Gregory Schmidt, Lawrence D. H. Wood*
- *"Critical Care Medicine: The Essentials" – John J. Marini & David J. Dries*
- *"Oxford Handbook of Critical Care" – Mervyn Singer & Andrew Webb*

Course Title: Hematology & Blood Bank	L	T	P	Cr.
Course Code: BOA6357	4	0	0	4

Total Hours: 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Components, characteristics and function of human blood and to identify the principle of routine
2. Hematological tests including sources of error and clinical significance of results.
3. Study the components, characteristics and function of human blood.
4. Identify the principle of routine hematological tests including sources of error and clinical significance of results.

Course Contents

UNIT-I

15 Hours

Blood cells, Hemoglobin, Coagulation Factors, Immunoglobulin, Red Cell Antigen, Natural Antibodies, Rh System, Rh Antigens & Rh Antibodies, Antigen antibody reaction, Agglutination, Hem agglutination. Blood grouping techniques, Methods for ABO grouping, Slide & Tube Method, Difficulties in ABO grouping, Antiserum used in ABO test procedures, Anti -A, Anti B, AntiAB, and Inheritance of the Blood groups.

UNIT-II

15 Hours

Methods of blood collection, Anticoagulant- Definition, types of anti coagulant- (EDTA, Citrate, Oxalate, Heparin, sodium fluoride), mechanism of coagulation, Hemolysis of blood. Separation of serum & plasma, Criteria for blood specimen rejection, Changes in blood, Maintenance of specimen identification, Transportation of the blood, Storage of blood in blood bank, Universal precautions.

UNIT-III

15 Hours

Bone Marrow, Cell composition of normal adult Bone marrow, Aspiration, Indication, Preparation & Staining, Basic Hematological Techniques. Characteristics of a good technician, Preparation of specimen collection material, Lab request form, Collection methods of bone marrow specimen, Indication and complications.

UNIT-IV

15 Hours

Blood Transfusion: Indications of blood transfusion, reactions of blood transfusion and precaution of blood transfusion. Blood Donation:

Introduction, Blood donor requirements, Criteria for selection & rejection, Medical history & personal details, Self-exclusion, Health checks before donating blood, Blood collection packs, Anticoagulants, Instructions given to the donor after blood donation, Adverse donor reaction. Testing Donor Blood, Blood Donor Records, Storage of blood, Changes in blood after storage.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- Hoffbrand, A. V., Moss, P. A. H., & Pettit, J. E. (2019). *Essential Haematology (7th ed.)*. Wiley-Blackwell.
- Rodak, B. F., & Carr, J. H. (2016). *Clinical Hematology Atlas (5th ed.)*. Elsevier.
- Harmening, D. M. (2019). *Modern Blood Banking & Transfusion Practices (7th ed.)*. F.A. Davis Company.
- Rodak, B. F., Fritsma, G. A., & Keohane, E. M. (2018). *Hematology: Clinical Principles and Applications (5th ed.)*. Elsevier.
- Turgeon, M. L. (2019). *Clinical Hematology and Fundamentals of Hemostasis (6th ed.)*. F.A. Davis Company.

Course Title: Advanced Cardiac Catheterization	L	T	P	Cr.
Course Code: BOA6358	4	0	0	4

Total Hours 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Explain the indications, contraindications, and complications of cardiac catheterization.
2. Describe the anatomy and physiology of the cardiovascular system related to catheter-based interventions.
3. Understand radiological imaging techniques used during cardiac catheterization (fluoroscopy, angiography).
4. Interpret pressure-volume loops and their significance in cardiac function assessment.
5. Utilize intravascular ultrasound (IVUS) and optical coherence tomography (OCT) for vessel imaging.

Course Contents

UNIT-I

10 Hours

Pressure-Volume Loops: Cardiac cycle and pressure-volume relationships, End-systolic and end-diastolic pressure-volume relations. Intravascular Ultrasound (IVUS): Principles and physics of IVUS imaging. Optical Coherence Tomography (OCT): Basic principles and light-based imaging physics, High-resolution coronary artery imaging Fractional Flow Reserve (FFR): FFR technique and interpretation Clinical decision-making using FFR (ischemia-guided PCI)

UNIT-II

10 Hours

Chronic Total Occlusion (CTO) Percutaneous Coronary Intervention (PCI): Definition and classification of CTO lesions. Bifurcation Stenting: Medina classification of bifurcation lesions. Rotational Atherectomy: Indications for calcium modification, Burr sizing, rotational speed, and procedural safety. Complication Management: Coronary artery dissection (types, treatment strategies), Coronary perforation (classification, coil embolization, covered stents)

UNIT-III**15 Hours**

Transcatheter Aortic Valve Replacement (TAVR): Indications and patient selection criteria, Types of transcatheter heart valves and procedural approaches (transfemoral, transapical), Procedural steps, imaging guidance, and valve deployment, Complications (paravalvular leak, conduction disturbances, vascular injury), MitraClip for Mitral Regurgitation, Left Atrial Appendage Occlusion (LAAO), Pediatric Cardiac Catheterization Interventions, Hybrid procedures for complex congenital heart disease

UNIT-IV**15 Hours**

Catheter Ablation for Atrial Fibrillation: Mechanisms of atrial fibrillation and mapping strategies, Lead Extraction Techniques, Artificial Intelligence (AI) in Cardiac Imaging. Bioresorbable Scaffolds & Next-Gen Stents, Clinical trials and real-world experience with BVS

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested Readings:

- Kern, M. J. *"The Cardiac Catheterization Handbook."* Elsevier (2023).
- *"Grossman & Baim's Cardiac Catheterization, Angiography, and Intervention"* – Manny Topol & Morton J. Kern
- *The definitive guide covering hemodynamics, imaging, complex interventions, and procedural techniques.*
- *"The Interventional Cardiology Handbook"* – Michael J. Lim, Thach Nguyen & Morton J. Kern
- *A practical, step-by-step guide on coronary interventions, structural heart procedures, and hemodynamic assessment.*
- *"Textbook of Interventional Cardiology"* – Eric J. Topol & Paul S. Teirstein
- *Covers advanced interventional techniques, including CTO PCI, bifurcation lesions, and structural interventions.*

Course Title: Health Care	L	T	P	Cr.
Course Code: BOA6359	4	0	0	4

Total Hours: 60 hrs

Learning Outcomes: After completion of this course, the learner will be able:

1. Teach the measures of the health services and high-quality health care
2. Recognize whether the health care delivery system is providing high-quality health care and whether quality is changing over time.
3. Provide to National Health Programme- Background objectives, action plan, targets, operations, in various National Health Programme.
4. Introduce the AYUSH System of medicines.

Course Contents

UNIT-I

15 Hours

Introduction to healthcare delivery system – Healthcare delivery system in India at primary, secondary and tertiary care; Community participation in healthcare delivery system; Health system in developed countries; Private / Govt. Sector;

UNIT-II

15 Hours

National Health Mission; National Health Policy; Issues in Health Care Delivery System in India Medicine – Introduction to Ayurveda; Yoga and Naturopathy; Unani; Siddha; Homeopathy; Need for integration of various system of medicine

UNIT-III

15 Hours

National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Health Programme. Introduction to AYUSH system of Health Scenario of India- past, present and future Demography & Vital Statistics- Demography – its concept; Census & its impact on health policy Epidemiology – Principles of Epidemiology Natural History of disease.

UNIT-IV

15 Hours

Methods of Epidemiological studies Epidemiology of communicable & non-communicable diseases, disease, and transmission, host defense immunizing agents, cold chain, immunization, disease, monitoring and surveillance.

Transactional modes: Video based teaching, Collaborative teaching, Case based teaching, Question-Answer.

Suggested readings:

- *National Health Programs Of India National Policies and Legislations Related to Health: J. Kishore (Author)*
- *A Dictionary of Public Health Paperback by J Kishor*
- *Health System in India: Crisis & Alternatives, National Coordination Committee, Jan SwasthyaAbhiyanIn search In Search of the Perfect Health SystemCentral Bureau of Health Intelligence (1998).*
- *Health Information of India, Ministry of Health and Family Welfare, New Delhi. Goyal R. C. (1993).*
- *Handbook of Hospital Personal Management, Prentice Hall of India, New*