GURU KASHI UNIVERSITY

B.VOC. in Operation Theatre

Session 2025-26

Faculty of Health and Allied Sciences

Graduates Attributes

The programme B.VOC. in Operation Theatre Technology imparts to students a strong foundation in surgical and patient care practices. Graduates develop the ability to assist in pre-operative, intra-operative, and post-operative procedures with precision and safety. They are trained to handle surgical instruments, maintain aseptic conditions, support the surgical team, and ensure effective patient care in a critical healthcare environment. The programme nurtures technical competence, problem-solving ability, teamwork, and professional ethics essential for delivering quality healthcare services.

Programme Learning Outcomes: After Completion Of this Course Gradates will able to:

- Assist surgeons and anesthesiologists during surgical procedures by preparing and managing operation theatre equipment, instruments, and sterile supplies.
- Apply infection control practices and maintain aseptic conditions to ensure patient safety and minimize surgical site complications.
- Demonstrate competence in pre-operative, intra-operative, and post-operative patient care with professional responsibility and empathy.
- Operate and maintain essential surgical and anesthesia equipment, ensuring effective functioning and safety standards.
- Work effectively as part of a multidisciplinary healthcare team, demonstrating communication skills, ethical conduct, and adherence to professional standards.

Programme Structure

Semester 1st										
S. No.	**Course Code**	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Cr.**	**Int**	**Ext**	**Total Marks**
1	BVT101	Anatomy & Physiology – I	Core Based	2	0	0	2	15	35	50
2	BVT102	Fundamentals of Operation Theatre Technology	Core Based	2	0	0	2	15	35	50
3	BVT103	Basic Microbiology & Infection Control	Core Based	2	0	0	2	15	35	50
4	BVT104	Biomedical Waste Management	Core Based	2	0	0	2	15	35	50
5	BVT105	Entrepreneurship Setup & Lauch	Skill Based	0	0	4	2	15	35	50
6	BVT106	Anatomy & Physiology – I Practical	Skill Based	0	0	4	2	15	35	50
7	BVT107	Fundamentals of Operation Theatre Technology Practical	Skill Based	0	0	4	2	15	35	50
8	BVT108	Basic Microbiology & Infection Control Practical	Skill Based	0	0	4	2	15	35	50
9	BVT109	Biomedical Waste Management Practical	Skill Based	0	0	4	2	15	35	50
10	BVT110	Communication and Soft Skills	Compulsory Foundation	2	0	0	2	15	35	50

11	BVT111	Human Rights and Duties	Multi-Disciplinary	3	0	0	3	25	50	75
Total				**13**	**0**	**20**	**23**	**175**	**400**	**575**

Semester 2nd										
S. No.	**Course Code**	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Cr.**	**Int**	**Ext**	**Total Marks**
1	BVT201	Anatomy & Physiology – II	Core Based	2	0	0	2	15	35	50
2	BVT202	Basics of Anesthesia Technology	Core Based	2	0	0	2	15	35	50
3	BVT203	Principles of Surgical Procedures	Core Based	2	0	0	2	15	35	50
4	BVT204	Pathology & Clinical Laboratory Basics	Core Based	2	0	0	2	15	35	50
5	BVT205	Computer Applications in Healthcare	Core Based	2	0	0	2	15	35	50
6	BVT206	Anatomy & Physiology – II Practical	Skill Based	0	0	4	2	15	35	50
7	BVT207	Basics of Anesthesia Technology Practical	Skill Based	0	0	4	2	15	35	50
8	BVT208	Principles of Surgical Procedures Practical	Skill Based	0	0	4	2	15	35	50
9	BVT209	Pathology & Clinical Laboratory Basics Practical	Skill Based	0	0	4	2	15	35	50
10	BVT210	Computer Applications in Healthcare Practical	Skill Based	0	0	4	2	15	35	50
11	BVT211	Environmental Sciences	Compulsory Foundation	2	0	0	2	15	35	50

12	BVT212	First Aid	Value Added Courses	2	0	0	2	15	35	50
Total				**14**	**0**	**20**	**24**	**180**	**420**	**600**

Semester 3rd										
S. No.	**Course Code**	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Cr.**	**Int**	**Ext**	**Total Marks**
1	BVT301	Pharmacology & Emergency Drugs	Core Based	2	0	0	2	15	35	50
2	BVT302	Anesthesia & Patient Monitoring – I	Core Based	2	0	0	2	15	35	50
3	BVT303	Surgical Techniques & Instrumentation – I	Core Based	2	0	0	2	15	35	50
4	BVT304	Sterilization & Disinfection Techniques	Core Based	2	0	0	2	15	35	50
5	BVT305	Basic Principle of Hospital Management	Core Based	2	0	0	2	15	35	50
6	BVT306	Pharmacology & Emergency Drugs Practical	Skill Based	0	0	4	2	15	35	50
7	BVT307	Anesthesia & Patient Monitoring – I Practical	Skill Based	0	0	4	2	15	35	50
8	BVT308	Surgical Techniques & Instrumentation – I Practical	Skill Based	0	0	4	2	15	35	50
9	BVT309	Sterilization & Disinfection Techniques Practical	Skill Based	0	0	4	2	15	35	50
10	BVT310	Basic Principle of Hospital Management Practical	Skill Based	0	0	4	2	15	35	50
11	BVT311	Community Health & Primary Care	Compulsory	3	0	0	3	25	50	75

			Foundation							
Total				**13**	**0**	**20**	**23**	**175**	**400**	**575**

Semester 4th										
S. No.	**Course Code**	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Cr.**	**Int**	**Ext**	**Total Marks**
1	BVT401	Anesthesia & Patient Monitoring – II	Core Based	2	0	0	2	15	35	50
2	BVT402	Surgical Techniques & Instrumentation – II	Core Based	2	0	0	2	15	35	50
3	BVT403	Radiology & Imaging for OT Technologists	Core Based	2	0	0	2	15	35	50
4	BVT404	Critical Care & ICU Management	Core Based	2	0	0	2	15	35	50
5	BVT405	Blood Transfusion & Transplant Technology	Core Based	2	0	0	2	15	35	50
6	BVT406	Advanced Patient Care & Pain Management	Core Based	2	0	0	2	15	35	50
7	BVT407	Anesthesia & Patient Monitoring – II Practical	Skill Based	0	0	4	2	15	35	50
8	BVT408	Surgical Techniques & Instrumentation – II Practical	Skill Based	0	0	4	2	15	35	50
9	BVT409	Radiology & Imaging for OT Technologists Practical	Skill Based	0	0	4	2	15	35	50
10	BVT410	Critical Care & ICU Management Practical	Skill Based	0	0	4	2	15	35	50
11	BVT411	Blood Transfusion & Transplant Technology Practical	Skill Based	0	0	4	2	15	35	50

12	BVT412	Advanced Patient Care & Pain Management Practical	Skill Based	0	0	4	2	15	35	50
Total				**12**	**0**	**24**	**24**	**180**	**420**	**600**

Semester 5th										
S. No.	**Course Code**	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Cr.**	**Int**	**Ext**	**Total Marks**
1	BVT501	Advanced Anesthesia Techniques	Core Based	2	0	0	2	15	35	50
2	BVT502	Specialized Surgical Procedures	Core Based	2	0	0	2	15	35	50
3	BVT503	OT Safety, Disaster & Emergency Management	Core Based	2	0	0	2	15	35	50
4	BVT504	Trauma & Cardiac Life Support	Core Based	2	0	0	2	15	35	50
5	BVT505	Medical Ethics & Legal Issues	Multidisciplinary	3	0	0	3	25	50	75
6	BVT506	Research Methodology & Biostatistics	Core Based	2	0	0	2	15	35	50
7	BVT507	Advanced Anesthesia Techniques Practical	Skill Based	0	0	4	2	15	35	50
8	BVT508	Specialized Surgical Procedures Practical	Skill Based	0	0	4	2	15	35	50
9	BVT509	OT Safety, Disaster & Emergency Management Practical	Skill Based	0	0	4	2	15	35	50
10	BVT510	Trauma & Cardiac Life Support Practical	Skill Based	0	0	4	2	15	35	50
11	BVT511	Research Methodology & Biostatistics Practical	Skill Based	0	0	4	2	15	35	50
Total				**13**	**0**	**20**	**23**	**175**	**400**	**575**

Semester 6th										
S. No.	**Course Code**	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Cr.**	**Int**	**Ext**	**Total Marks**
1	BVT601	Internship	Skill Based	0	0	40	20	150	350	500
Total				**0**	**0**	**40**	**20**	**150**	**350**	**500**
Grand Total				**65**	**0**	**144**	**137**	**1035**	**2390**	**3425**

Semester 1st

Course Title: Anatomy & Physiology – I	L	T	P	Cr
Course Code: BVT101	2	0	0	2

Total Hours 30

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

1. Understand the basic structure and functions of the human body.
2. Identify major organs and organ systems along with their physiological roles.
3. Describe fundamental anatomical terms and planes used in medical sciences.
4. Correlate anatomical structures with their physiological mechanisms.
5. Apply basic anatomical and physiological knowledge to clinical and paramedical practices.

Course Contents

UNIT I: Introduction to Anatomy and Physiology (10 Hours)

- Definition and scope of anatomy and physiology
- Levels of structural organization in the human body
- Anatomical terminology, body planes, positions, and cavities
- Basic concepts of homeostasis

UNIT II: Skeletal and Muscular System (10 Hours)

- Structure and classification of bones
- Major bones and joints of the human body
- Overview of the axial and appendicular skeleton
- Types of muscles, structure of skeletal muscle
- Physiology of muscle contraction and muscle tone

UNIT III: Cardiovascular and Respiratory System (5 Hours)

- Structure of the heart and major blood vessels

- Circulation of blood: systemic, pulmonary, and portal circulation
- Composition and functions of blood
- Structure and functions of respiratory organs
- Mechanism of breathing and regulation of respiration

UNIT IV: Digestive and Excretory System (5 Hours)

- Structure and functions of digestive organs
- Physiology of digestion and absorption
- Structure of kidney and nephron
- Physiology of urine formation and fluid balance

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *TORTORA GJ, DERRICKSON BH. Principles of Anatomy and Physiology. 15th ed. Hoboken: Wiley; 2017.*
- *MARIEB EN, HOEHN K. Human Anatomy & Physiology. 11th ed. Pearson; 2018.*
- *ROSS MH, WOHLTMANN H, ROMRELL LJ. Histology: A Text and Atlas. 7th ed. Philadelphia: Wolters Kluwer; 2015.*
- *HALL JE. Guyton and Hall Textbook of Medical Physiology. 14th ed. Philadelphia: Elsevier; 2021.*
- *DRAKE RL, VOGL W, MITCHELL AWM. Gray's Anatomy for Students. 4th ed. Philadelphia: Elsevier; 2019.*

Course Title: Fundamentals of Operation Theatre Technology	L	T	P	Cr
Course Code: BVT102	2	0	0	2

Total Hours 30

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

1. Understand the basic principles of operation theatre (OT) technology.
2. Identify the layout, design, and essential facilities of a modern OT.
3. Demonstrate knowledge of aseptic techniques and infection control measures.
4. Describe the roles and responsibilities of OT personnel.
5. Recognize the importance of sterilization, disinfection, and biomedical waste management in OT practices.

Course Contents

UNIT I: Introduction to Operation Theatre (10 Hours)

- Definition, scope, and importance of OT technology
- Structure and design of operation theatre complex
- Zoning in operation theatre: protective, clean, aseptic, disposal zones
- Air conditioning, lighting, and ventilation in OT

UNIT II: Aseptic Techniques and Infection Control (10 Hours)

- Concept of asepsis and antisepsis
- Hand washing, gowning, gloving, and masking techniques
- Cleaning and fumigation of OT
- Hospital-acquired infections (HAIs) and prevention strategies
- Standard precautions and universal safety protocols

UNIT III: Sterilization and Disinfection (5 Hours)

- Principles of sterilization
- Methods of sterilization: physical, chemical, gaseous, and radiation
- Methods of disinfection: chemical and physical
- Sterility testing and indicators

UNIT IV: Roles, Responsibilities, and Waste Management (5 Hours)

- Duties of operation theatre technologist

- Coordination with surgical team (surgeons, anesthetists, nurses)
- Biomedical waste management in OT
- Legal and ethical aspects of OT practice

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *SANDERS S. Berry & Kohn's Operating Room Technique. 14th ed. Philadelphia: Elsevier; 2020.*
- *BERRY AJ, EDELMAN S. Basic Surgical Techniques. 5th ed. London: Elsevier; 2017.*
- *JAGADEESH H, NAGALINGAM S. Textbook of Operation Theatre Technology. New Delhi: Jaypee Brothers; 2020.*
- *WHO. Practical Guidelines for Infection Control in Health Care Facilities. New Delhi: WHO Regional Office; 2004.*
- *PARK K. Preventive and Social Medicine. 27th ed. Jabalpur: Banarsidas Bhanot; 2023.*

Course Title: Basic Microbiology & Infection Control	L	T	P	Cr
Course Code: BVT103	2	0	0	2

Total Hours 30

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

1. Understand the fundamental concepts of microbiology and microorganisms.
2. Differentiate between types of microorganisms (bacteria, viruses, fungi, parasites).
3. Describe methods of microbial growth, culture, and identification.
4. Recognize the role of microbes in health and disease.
5. Apply principles of infection control and prevention in healthcare settings.
6. Follow standard protocols for sterilization, disinfection, and biomedical waste management.

Course Contents

UNIT I: Introduction to Microbiology (10 Hours)

- History and scope of microbiology
- Classification of microorganisms (bacteria, viruses, fungi, protozoa)
- Structure and morphology of bacteria and viruses
- Normal flora and its importance

UNIT II: Microbial Growth and Pathogenicity (10 Hours)

- Nutrition and growth requirements of microbes
- Methods of bacterial growth and culture techniques
- Factors influencing microbial growth
- Pathogenic microorganisms and their role in human infections
- Host–pathogen interaction

UNIT III: Principles of Infection Control (5 Hours)

- Chain of infection and modes of transmission
- Hospital-acquired infections (nosocomial infections)
- Standard precautions and barrier nursing
- Personal protective equipment (PPE)

UNIT IV: Sterilization, Disinfection, and Waste Management (5 Hours)

- Methods of sterilization (physical, chemical, gaseous, radiation)
- Disinfection methods and commonly used agents
- Biomedical waste management in healthcare settings
- National guidelines and protocols for infection prevention

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *PRESCOTT LM, HARLEY JP, KLEIN DA. Microbiology. 10th ed. New York: McGraw-Hill; 2021.*
- *TORTORA GJ, FUNKE BR, CASE CL. Microbiology: An Introduction. 13th ed. Pearson; 2020.*
- *PELCZAR MJ, CHAN ECS, KRIEG NR. Microbiology: Concepts and Applications. 5th ed. New York: McGraw-Hill; 2018.*
- *WHO. Core Components for Infection Prevention and Control Programmes. Geneva: World Health Organization; 2016.*
- *ANANTHANARAYAN R, PANIKER CKJ. Textbook of Microbiology. 11th ed. Hyderabad: Universities Press; 2023.*

Course Title: Biomedical Waste Management	L	T	P	Cr
Course Code: BVT104	2	0	0	2

Total Hours 30

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

1. Understand the sources and categories of biomedical waste in healthcare settings.
2. Classify biomedical waste according to national guidelines and international standards.
3. Apply safe handling, segregation, transportation, and disposal methods for biomedical waste.
4. Recognize the health hazards associated with improper waste management.
5. Implement infection control and occupational safety measures in waste management.
6. Comply with the Biomedical Waste Management Rules in India and WHO guidelines.

Course Contents

UNIT I: Introduction to Biomedical Waste (10 Hours)

- Definition and importance of biomedical waste management
- Sources and categories of biomedical waste (infectious, sharps, pharmaceutical, radioactive, etc.)
- Quantity and composition of biomedical waste generated in healthcare facilities
- Legal framework: Biomedical Waste Management Rules, 2016 (and amendments)

UNIT II: Segregation, Collection, and Transportation (10 Hours)

- Color coding and segregation of waste at source
- Collection, labeling, and storage of biomedical waste
- Transportation within and outside healthcare facilities
- Role of healthcare workers and waste handlers

UNIT III: Treatment and Disposal Methods (5 Hours)

- Incineration, autoclaving, microwaving, chemical disinfection
- Disposal of sharps, plastics, and radioactive waste
- Deep burial and secured landfill methods
- Limitations and challenges in waste treatment

UNIT IV: Health Hazards and Safety Measures (5 Hours)

- Hazards of biomedical waste: infections, injuries, environmental impact
- Occupational health and safety of healthcare workers
- Use of personal protective equipment (PPE)
- Role of government, NGOs, and hospital committees in waste management

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *GOVT. OF INDIA. Biomedical Waste Management Rules 2016 with Amendments. Ministry of Environment, Forest and Climate Change; 2018.*
- *WORLD HEALTH ORGANIZATION. Safe Management of Wastes from Health-Care Activities. 2nd ed. Geneva: WHO; 2014.*
- *PARK K. Preventive and Social Medicine. 27th ed. Jabalpur: Banarsidas Bhanot; 2023.*
- *RAJESHWARI K. Textbook of Biomedical Waste Management. New Delhi: Jaypee Brothers; 2020.*
- *CENTRAL POLLUTION CONTROL BOARD (CPCB). Guidelines for Management of Healthcare Waste. New Delhi: CPCB; 2018.*

Course Title: Entrepreneurship Setup & Lauch	L	T	P	Cr.
Course Code: BVT105	0	0	4	2

Introduction: This semester lays the foundation for the learner to understand what entrepreneurship is, beyond just starting a business. It introduces key ideas like problem-solving, value creation, and self-awareness. The learner will begin exploring basic business concepts while discovering their own interests and strengths.

Learners Objective: After Completion of this course, the learner will be able to:

1. Understand the core concepts of entrepreneurship through relatable, real-life examples.
2. Begin to see themselves as problem-solvers and creators.
3. Learn about business paths and choose one to try based on interest or local fit.
4. Launch a micro-hustle (online or offline) to earn their first income.
5. Build confidence and self-belief by doing.

Outcome: By the end of this semester, learners will start a simple business activity, earn their first income, and build belief in their ability to do business.

Guiding Principles/Approach: This syllabus is built on principles of experiential learning, growth mindset development, and identity-first learning. Drawing from learning science and behavior design, the course shifts students from passive learning to active doing, where they try out small business activities in real contexts. The design helps students not just learn entrepreneurship, but begin to see themselves as entrepreneurs. Emphasis is placed on small wins, peer collaboration, and locally relevant opportunities to ensure learning feels achievable and connected to their realities. The curriculum focuses on conceptual understanding without heavy theory, combining practical action, reflection, and collaboration. By making progress visible and

success feel possible, it plants the seeds of self-reliance, initiative, and long-term motivation.

Semester Syllabus:

Format: 12 weeks, 4 hours/week | 2 credits

Revenue Target: ₹10,000

Week	Learning Goal	Measurable Outcome
1	Understand what entrepreneurship is and who can be an entrepreneur	Students define entrepreneurship in their own words and list 2 entrepreneurs from their local area or community
2	Connect personal identity to entrepreneurship (strengths, interests, struggles)	Students create a "value map" showing how a skill/interest/problem from their life could become a business opportunity
3	Learn about 5 business paths: content creation, dropshipping, cloud kitchen/food business, gig economy and local services	Students explore 1–2 examples from each domain and share one they're most curious to try and why
4	Choose a path and generate a basic business idea	Students write down a clear offer (what, for whom, why) and one way to reach their customer
5	Take first real action: message, post, pitch, or sell	Students reach out to or serve 1 real potential customer and record what happened
6	Reflect on first attempt and share with peers	Students share their result, a challenge faced, and one idea to improve next time

7	Improve and try again: aim for first ₹100	Students apply a change, try again, and aim to make their first ₹100 or get meaningful response
8	Learn how to identify and understand your target customer	Students talk to 2 potential customers or observe them and list 3 insights about their needs
9	Learn how to serve your target audience better	Students improve one part of their offer (product, delivery, messaging, or interaction) based on customer feedback or need
10	Explore core entrepreneurial values (resilience, honesty, effort)	Students reflect on 1 value they're building and show it in a business task or peer story
11	Focus on earning and staying consistent	Students complete a second earning task and track their consistency (e.g., same product or message for 3 days)
12	Reflect on earnings, grit, and how to keep going	Students record total earnings, one resilience moment, and one support system or habit they'll continue with

Weekly Component:

Component	Duration	Description
Learning Module	~1.5 hrs	• Introduces key concepts in a simple and engaging way • Includes, examples, and 1–2 interactive discussions or quizzes

Action Lab	~2 hrs	• Hands-on task on the weekly concept • Includes step-by-step guidance, templates, and worksheets • Ends with a submission (e.g., video, reflection, or proof of action)
Resources	Self-paced	• Supplementary videos, short readings, real- life stories, and tools to deepen understanding at their own pace

Evaluation Criteria

Evaluation Component	**Description**	**Weightage**
Weekly Task Completion	Timely submission of weekly tasks including reflections, activities, quizzes etc.	40%
Target Completion	Performance-based evaluation on hitting **revenue or profit targets** (e.g., generating ₹10,000 revenue)	30%
Final Project	A comprehensive project based on the semester's theme	30%

Course Title: Anatomy & Physiology – I Practical	L	T	P	Cr.
Course Code: BVT106	0	0	4	2

Total Hours 60

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

1. Identify major bones, muscles, and organs of the human body.
2. Demonstrate the use of anatomical models, charts, and specimens.
3. Perform basic physiological experiments related to blood, cardiovascular, and respiratory systems.
4. Correlate theoretical knowledge with practical understanding of human structure and functions.
5. Develop hands-on skills required for paramedical and allied health sciences.

Course Content

List of Practicals / Experiments (60 Hours)

- Introduction to laboratory safety and handling of specimens/models.
- Study of human skeleton: identification of major bones (axial and appendicular).
- Demonstration of types of joints and their movements.
- Identification of major muscles using charts and models.
- Study of circulatory system:
  - Structure of heart (using models/specimens).
  - Identification of major blood vessels.
- Measurement of pulse rate and blood pressure.
- Estimation of hemoglobin concentration.
- Determination of blood group (ABO and Rh typing).
- Preparation of blood smear and identification of blood cells.
- Counting of red blood cells (RBC) using hemocytometer.
- Counting of white blood cells (WBC) using hemocytometer.
- Demonstration of respiratory system using models/specimens.

- Measurement of respiratory rate and vital capacity (using spirometer, if available).
- Study of digestive system using charts and models.
- Study of urinary system using charts and models.

Suggested Readings

- *CHAITOW L, DE LANY J. Clinical Anatomy and Physiology for Healthcare Professionals. 3rd ed. Elsevier; 2018.*
- *TORTORA GJ, DERRICKSON BH. Principles of Anatomy and Physiology. 15th ed. Wiley; 2017.*
- *MARIEB EN, SMITH LA. Human Anatomy & Physiology Laboratory Manual. 13th ed. Pearson; 2021.*
- *HALL JE. Guyton and Hall Textbook of Medical Physiology. 14th ed. Philadelphia: Elsevier; 2021.*
- *ROSS MH, PAWLINA W. Histology: A Text and Atlas. 8th ed. Wolters Kluwer; 2020.*

Course Title: Fundamentals of Operation Theatre Technology Practical	L	T	P	Cr.
Course Code: BVT107	0	0	4	2

Total Hours 60

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

1. Demonstrate proper hand washing, gowning, gloving, and masking techniques.
2. Apply aseptic techniques and infection control measures in the OT setting.
3. Identify and handle surgical instruments and equipment.
4. Assist in preparation of OT before, during, and after surgical procedures.
5. Follow standard protocols for sterilization, disinfection, and biomedical waste disposal.
6. Understand the roles and responsibilities of an OT technologist in a surgical team.

Course Content

List of Practicals / Experiments (60 Hours)

- Introduction to operation theatre complex: layout, zones, and protocols.
- Demonstration of hand washing techniques (normal, aseptic, and surgical scrub).
- Practice of gowning, gloving, and masking.
- Preparation of OT table and trolley for different types of surgeries.
- Identification and handling of common surgical instruments.
- Arrangement of surgical packs, drapes, and linen.
- Demonstration of fumigation and cleaning of OT.
- Sterilization techniques: autoclaving, dry heat, chemical sterilization (demonstration).
- Handling and disposal of sharps, soiled linen, and biomedical waste.

- Demonstration of donning and doffing PPE in OT.
- Observation of anesthesia machine and suction apparatus.
- Demonstration of safe handling and storage of OT equipment.
- Preparation of patient for surgery (positioning, draping, skin preparation – demonstration).
- Observation/assisting in minor surgical procedures (as per institutional policy).
- Mock drills for emergency preparedness in OT (fire safety, needle stick injury protocol).

Suggested Readings

- *SANDERS S. Berry & Kohn's Operating Room Technique. 14th ed. Philadelphia: Elsevier; 2020.*
- *JAGADEESH H, NAGALINGAM S. Textbook of Operation Theatre Technology. New Delhi: Jaypee Brothers; 2020.*
- *WHO. Practical Guidelines for Infection Control in Health Care Facilities. New Delhi: WHO Regional Office; 2004.*
- *STANFORD J. Surgical Instruments: A Pocket Guide. 4th ed. Elsevier; 2018.*
- *PARK K. Preventive and Social Medicine. 27th ed. Jabalpur: Banarsidas Bhanot; 2023.*

Course Title: Basic Microbiology & Infection Control Practical	L	T	P	Cr.
Course Code: BVT108	0	0	4	2

Total Hours 60

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

1. Demonstrate safe handling of laboratory equipment and biological specimens.
2. Prepare and observe microscopic slides of microorganisms.
3. Perform basic microbiological techniques such as staining, culture, and enumeration.
4. Apply aseptic techniques to prevent contamination.
5. Identify common pathogens under laboratory settings.
6. Practice infection control measures including sterilization, disinfection, and biomedical waste segregation.

Course Content

List of Practicals / Experiments (60 Hours)

- Introduction to microbiology laboratory: safety rules and biosafety levels.
- Familiarization with basic microbiology laboratory equipment (microscope, autoclave, laminar flow, incubator).
- Preparation and sterilization of culture media (nutrient agar, broth).
- Aseptic transfer techniques.
- Preparation of smears from specimens.
- Simple staining techniques (methylene blue).
- Differential staining techniques (Gram's staining).
- Acid-fast staining (Ziehl–Neelsen method).
- Observation of fungi and yeast using lactophenol cotton blue preparation.
- Culture methods: streak plate, pour plate, and spread plate techniques.

- Enumeration of bacteria (viable count using plate count method).
- Demonstration of antibiotic sensitivity testing (Kirby–Bauer method).
- Study of motility by hanging drop method.
- Demonstration of disinfection methods (chemical and physical).
- Demonstration of biomedical waste segregation and color coding.
- Hand hygiene demonstration: normal, hygienic, and surgical hand wash techniques.
- Demonstration of donning and doffing personal protective equipment (PPE).
- Visit to hospital microbiology lab / infection control unit (if feasible).

Suggested Readings

- *PELCZAR MJ, CHAN ECS, KRIEG NR. Microbiology: Concepts and Applications. 5th ed. New York: McGraw-Hill; 2018.*
- *TORTORA GJ, FUNKE BR, CASE CL. Microbiology: An Introduction. 13th ed. Pearson; 2020.*
- *ANANTHANARAYAN R, PANIKER CKJ. Textbook of Microbiology. 11th ed. Hyderabad: Universities Press; 2023.*
- *WHO. Laboratory Biosafety Manual. 4th ed. Geneva: World Health Organization; 2020.*
- *PRESCOTT LM, HARLEY JP, KLEIN DA. Microbiology. 10th ed. New York: McGraw-Hill; 2021.*

Course Title: Biomedical Waste Management Practical	L	T	P	Cr.
Course Code: BVT109	0	0	4	2

Total Hours 60

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

1. Demonstrate correct segregation of biomedical waste according to color coding.
2. Practice safe handling, labeling, and transport of biomedical waste.
3. Apply sterilization and disinfection methods in real-time scenarios.
4. Use personal protective equipment (PPE) properly while handling biomedical waste.
5. Implement national and WHO guidelines for biomedical waste disposal.
6. Participate in mock drills for emergency response to spills and accidents.

Course Content

List of Practicals / Experiments (60 Hours)

- Introduction to biomedical waste management: laboratory and hospital safety protocols.
- Familiarization with color-coded bins and bags used in waste segregation.
- Demonstration of biomedical waste segregation at source (sharps, infectious, plastics, anatomical waste).
- Labeling and barcoding of biomedical waste containers.
- Demonstration of collection and transportation of biomedical waste within hospital premises.
- Demonstration of autoclaving, chemical disinfection, and incineration methods (as available).
- Handling and disposal of sharps and needle destroyer usage.
- Demonstration of spill management (blood and chemical spills).
- Practice of donning and doffing personal protective equipment (PPE).

- Mock drill on emergency protocols (needle-stick injury management, accidental exposure).
- Visit/observation of a hospital waste management facility or incineration plant.
- Case discussions on biomedical waste-related hazards and prevention.

Suggested Readings

- *GOVT. OF INDIA. Biomedical Waste Management Rules, 2016 with Amendments. Ministry of Environment, Forest and Climate Change; 2018.*
- *WHO. Safe Management of Wastes from Health-Care Activities. 2nd ed. Geneva: World Health Organization; 2014.*
- *CPCB. Guidelines for Management of Healthcare Waste. New Delhi: Central Pollution Control Board; 2018.*
- *RAJESHWARI K. Textbook of Biomedical Waste Management. New Delhi: Jaypee Brothers; 2020.*
- *PARK K. Preventive and Social Medicine. 27th ed. Jabalpur: Banarsidas Bhanot; 2023.*

Course Title: Communication and Soft Skills	L	T	P	Cr
Course Code: BVT110	2	0	0	2

Total Hours 30

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

1. Develop effective verbal and non-verbal communication skills.
2. Demonstrate listening, speaking, reading, and writing skills in academic and professional contexts.
3. Apply interpersonal communication and teamwork skills in healthcare and allied settings.
4. Improve confidence in public speaking, presentations, and interviews.
5. Recognize the importance of empathy, etiquette, and professional behavior in patient care and workplace communication.

Course Contents

UNIT I: Fundamentals of Communication (10 Hours)

- Definition, process, and types of communication
- Barriers to effective communication and strategies to overcome them
- Verbal and non-verbal communication (tone, body language, gestures, posture, eye contact)
- Importance of communication in healthcare settings

UNIT II: Language and Professional Communication Skills (10 Hours)

- Listening skills: active listening, barriers to listening
- Speaking skills: pronunciation, fluency, clarity
- Reading comprehension and note-making
- Writing skills: formal letters, emails, reports, and memos
- Professional etiquette and telephone communication

UNIT III: Interpersonal and Team Communication (5 Hours)

- Role of communication in teamwork and collaboration
- Conflict management and negotiation skills
- Empathy and emotional intelligence in patient interaction
- Case studies: doctor–patient, nurse–patient, and interprofessional communication

UNIT IV: Presentation and Career Skills (5 Hours)

- Preparing and delivering oral presentations
- Group discussions and debates
- Interview skills and resume writing basics
- Time management, goal setting, and self-confidence building

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *KAUL A. Effective Business Communication. 2nd ed. New Delhi: PHI Learning; 2015.*
- *BISWAS C. Communication Skills for Professionals. 3rd ed. New Delhi: Pearson; 2019.*
- *MCGRATH E. Basic Managerial Skills for All. 9th ed. New Delhi: PHI Learning; 2017.*
- *LESIKAR RV, PETIT JD, FLATLEY ME. Basic Business Communication. 13th ed. New York: McGraw-Hill; 2017.*
- *KUMAR S, LATA P. Communication Skills. 2nd ed. New Delhi: Oxford University Press; 2018.*

Course Title: Human Rights and Duties	L	T	P	Cr
Course Code: BVT111	3	0	0	3

Total Hours 45

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

1. Explain the concept, origin, and evolution of human rights.
2. Understand the constitutional provisions and legal framework of human rights in India.
3. Recognize the duties and responsibilities of citizens in a democratic society.
4. Appreciate the role of international organizations in promoting and protecting human rights.
5. Apply the knowledge of rights and duties in healthcare, education, and social settings.

Course Contents

UNIT I: Introduction to Human Rights (15 Hours)

- Meaning, nature, and scope of human rights
- Historical evolution: Magna Carta, French Revolution, Universal Declaration of Human Rights (UDHR)
- Classification of rights: civil, political, economic, social, and cultural rights
- Philosophical and moral foundations of human rights

UNIT II: Constitutional Framework in India (10 Hours)

- Fundamental Rights and Directive Principles of State Policy
- Fundamental Duties under Article 51A of the Constitution
- Right to Equality, Right to Freedom, Right against Exploitation, Right to Constitutional Remedies
- Role of judiciary in protecting human rights

UNIT III: National and International Institutions (10 Hours)

- National Human Rights Commission (NHRC) and State Human Rights Commissions
- Role of NGOs and civil society in human rights protection
- United Nations and its specialized agencies (UNHRC, UNICEF, WHO, ILO)
- International Covenants and conventions on human rights

UNIT IV: Human Rights in Practice (10 Hours)

- Human rights and healthcare: patient rights, informed consent, dignity in treatment
- Rights of women, children, minorities, and vulnerable groups
- Human rights violations: causes and remedies
- Duties of citizens in maintaining harmony, protecting environment, and promoting democracy

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *BASU DD. Introduction to the Constitution of India. 25th ed. Gurgaon: LexisNexis; 2021.*
- *JAYARAMU J. Human Rights. 2nd ed. New Delhi: Atlantic Publishers; 2018.*
- *NIRMAL BC. Human Rights in India: Historical, Social and Political Perspectives. New Delhi: Oxford University Press; 2019.*
- *UNITED NATIONS. Universal Declaration of Human Rights. New York: UN; 1948.*
- *SUBRAMANIAN S. Human Rights: International Challenges. New Delhi: Rawat Publications; 2017.*

Semester 2nd

Course Title: Anatomy & Physiology – II	L	T	P	Cr
Course Code: BVT201	2	0	0	2

Total Hours 30

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

1. Explain the structure and functions of different organ systems of the human body.
2. Correlate physiological processes with normal health and common clinical conditions.
3. Demonstrate understanding of the integration of systems for maintaining homeostasis.
4. Apply anatomical and physiological knowledge in clinical and paramedical practices.

Course Contents

UNIT–I: Cardiovascular System (10 Hours)

- Structure of heart, layers, chambers, and valves.
- Blood circulation: systemic, pulmonary, and portal circulation.
- Cardiac cycle, heart sounds, blood pressure, pulse, and ECG basics.
- Physiology of cardiac output and regulation.

UNIT–II: Respiratory System (10 Hours)

- Anatomy of respiratory tract and lungs.
- Mechanism of breathing, ventilation, and gas exchange.
- Transport of gases (oxygen and carbon dioxide).
- Regulation of respiration and applied aspects (hypoxia, dyspnea, cyanosis).

UNIT–III: Digestive System (5 Hours)

- Anatomy of alimentary canal and accessory organs.
- Physiology of digestion and absorption of carbohydrates, proteins, and fats.
- Role of liver, pancreas, and gall bladder.

UNIT–IV: Excretory System (5 Hours)

- Anatomy of kidney, nephron, and urinary tract.
- Mechanism of urine formation.
- Regulation of water, electrolytes, and acid–base balance.
- Applied aspects: renal failure, dialysis basics.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *TORTORA GJ, DERRICKSON BH. Principles of Anatomy and Physiology. 15th ed. Hoboken: Wiley; 2017.*
- *MARIEB EN, HOEHN K. Human Anatomy & Physiology. 11th ed. New York: Pearson; 2018.*
- *ROSS MH, PAWLINA W. Histology: A Text and Atlas. 8th ed. Philadelphia: Wolters Kluwer; 2020.*
- *GUYTON AC, HALL JE. Textbook of Medical Physiology. 14th ed. Philadelphia: Elsevier; 2021.*
- *DATTA AK. Essentials of Human Anatomy. Vol I–III. 10th ed. Kolkata: Current Books International; 2018.*
- *CHOUDHURY AR. Concise Medical Physiology. 8th ed. Kolkata: New Central Book Agency; 2016.*

Course Title: Basics of Anesthesia Technology	L	T	P	Cr
Course Code: BVT202	2	0	0	2

Total Hours 30

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

1. Describe the principles of anesthesia and its role in surgical and diagnostic procedures.
2. Identify different types of anesthetic agents and techniques.
3. Explain the function and components of basic anesthesia equipment.
4. Recognize safety measures and monitoring requirements in anesthesia practice.
5. Apply knowledge of anesthesia technology in supporting anesthesiologists during perioperative care.

Course Contents

UNIT–I: Introduction to Anesthesia (10 Hours)

- Definition, history, and scope of anesthesia.
- General concepts: sedation, analgesia, anesthesia.
- Types of anesthesia: general, regional, local.
- Stages of general anesthesia.

UNIT–II: Anesthetic Agents and Drugs (10 Hours)

- Inhalational anesthetics (volatile agents, gases).
- Intravenous anesthetics.
- Local anesthetics: classification, mechanism, and uses.
- Muscle relaxants and adjuvant drugs.
- Concept of balanced anesthesia.

UNIT–III: Anesthesia Equipment & Airway Management (5 Hours)

- Anesthesia machine: basic components and safety features.
- Vaporizers, flowmeters, breathing circuits.
- Airway devices: endotracheal tubes, laryngeal mask airways, suction apparatus.

UNIT–IV: Monitoring & Safety in Anesthesia (5 Hours)

- Basic monitoring: ECG, pulse oximetry, blood pressure, capnography.

- Infection control and sterilization in anesthesia practice.
- Occupational safety and hazards in anesthesia technology.
- Emergency management: awareness of resuscitation and CPR basics.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *MILLER RD, COHEN NH, ERIKSSON LI, FLEISHER LA, WIENER-KRONISH JP, YOUNG WL. Miller's Anesthesia. 9th ed. Philadelphia: Elsevier; 2020.*
- *BARASH PG, CULLEN BF, STOELTING RK, CAUDLE KE, STOCK MC, ORTIZ VE. Clinical Anesthesia. 9th ed. Philadelphia: Wolters Kluwer; 2021.*
- *DATTA S. Obstetric Anesthesia Handbook. 6th ed. New York: Springer; 2018.*
- *JOSHI GP, CHUNG F. Essentials of Ambulatory Anesthesia. 2nd ed. New York: Springer; 2016.*
- *NIMMO AF, SMITH AF. Anaesthesia: A Very Short Introduction. Oxford: Oxford University Press; 2018.*
- *RANG HP, DALE MM, RITTER JM, FLOWER RJ, HENDERSON G. Pharmacology. 9th ed. Edinburgh: Elsevier Churchill Livingstone; 2019.*

Course Title: Principles of Surgical Procedures	L	T	P	Cr
Course Code: BVT203	2	0	0	2

Total Hours 30

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

1. Explain the basic principles of asepsis, sterilization, and infection control in surgery.
2. Describe preoperative, intraoperative, and postoperative procedures.
3. Identify surgical instruments and their uses.
4. Understand the roles of surgical team members and operating room protocols.
5. Apply knowledge of surgical procedures in assisting surgeons and maintaining patient safety.

Course Contents

UNIT–I: Introduction to Surgery & Asepsis (10 Hours)

- Evolution and scope of surgery.
- Basic surgical principles: asepsis, antisepsis, sterilization, and disinfection.
- Operation theatre environment and zoning.
- Surgical attire, hand washing, scrubbing, and gowning.
- Principles of surgical safety.

UNIT–II: Surgical Instruments & Techniques (10 Hours)

- Classification and uses of surgical instruments (cutting, grasping, retracting, suturing).
- Basic surgical techniques: incision, dissection, hemostasis, suturing, knotting.
- Electrosurgery basics.
- Handling of instruments and surgical trays.

UNIT–III: Preoperative & Intraoperative Care (5 Hours)

- Preoperative assessment and patient preparation.
- Positioning of patients for different surgical procedures.
- Maintenance of sterile field.

- Role of surgical technologist/OT assistant during surgery.

UNIT–IV: Postoperative Care & Complications (5 Hours)

- Immediate postoperative care and recovery room setup.
- Monitoring vital signs and wound care.
- Recognition and management of common postoperative complications (shock, bleeding, infection).
- Safe transport of patient to recovery ward.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *TOWNES AS. Principles of Surgery. 7th ed. New York: McGraw-Hill; 2020.*
- *SCHWARTZ SI, BRUNICARDI FC, ANDERSEN DK, BILLER BMK, DUNN DL, HUNTER JG, POLLOCK RE. Schwartz's Principles of Surgery. 11th ed. New York: McGraw-Hill; 2019.*
- *BROCK A, NOLAN JP, COOPER G. Essential Surgical Skills. 5th ed. Oxford: Oxford University Press; 2021.*
- *KAPOOR A. Textbook of Surgical Instruments and Procedures. New Delhi: Jaypee Brothers; 2018.*
- *KAPLAN LJ. Essentials of General Surgery and Surgical Specialties. 6th ed. Philadelphia: Wolters Kluwer; 2019.*
- *FARQUHARSON M, MORAN B. Farquharson's Textbook of Operative General Surgery. 10th ed. Boca Raton: CRC Press; 2014.*

Course Title: Pathology & Clinical Laboratory Basics	L	T	P	Cr
Course Code: BVT204	2	0	0	2

Total Hours 30

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

1. Explain the fundamental concepts of pathology including cell injury, inflammation, and neoplasia.
2. Describe the role of the clinical laboratory in disease diagnosis and patient management.
3. Identify and explain basic laboratory techniques in hematology, biochemistry, microbiology, and histopathology.
4. Apply principles of biosafety, infection control, and quality assurance in a laboratory setting.
5. Correlate laboratory findings with common clinical conditions.

Course Contents

UNIT–I: Fundamentals of Pathology (10 Hours)

- Definition and scope of pathology.
- Cellular injury and adaptations.
- Inflammation and repair.
- Hemodynamic disorders (edema, thrombosis, embolism, shock).
- Neoplasia: benign vs malignant tumors.

UNIT–II: Basics of Clinical Laboratory Science (10 Hours)

- Organization of clinical laboratories (hematology, biochemistry, microbiology, pathology).
- Principles of specimen collection, labeling, transport, and storage.
- Blood collection techniques (venipuncture, capillary sampling).
- Laboratory safety: universal precautions, biosafety cabinets, biomedical waste management.
- Quality control and assurance in clinical labs.

UNIT–III: Hematology & Clinical Biochemistry (5 Hours)

- Composition of blood and normal values.
- Common hematology tests: CBC, ESR, peripheral smear.

- Biochemical tests: blood sugar, urea, creatinine, liver function tests (LFT).

UNIT–IV: Microbiology & Histopathology Basics (5 Hours)

- Introduction to microorganisms of medical importance.
- Collection and processing of urine, sputum, and stool samples.
- Principles of staining (Gram stain, acid-fast stain).
- Basics of tissue processing and biopsy specimen handling.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *ROBBINS SL, COTRAN RS, KUMAR V. Robbins and Cotran Pathologic Basis of Disease. 10th ed. Philadelphia: Elsevier; 2020.*
- *HARSH MOHAN. Textbook of Pathology. 8th ed. New Delhi: Jaypee Brothers; 2019.*
- *DUTTA S. Textbook of Pathology for Allied Health Science Students. 2nd ed. New Delhi: Jaypee Brothers; 2020.*
- *HENRY JB. Clinical Diagnosis and Management by Laboratory Methods. 23rd ed. Philadelphia: Elsevier; 2017.*
- *MURRAY PR, ROSENTHAL KS, PFALLER MA. Medical Microbiology. 9th ed. Philadelphia: Elsevier; 2020.*
- *TIETZ NW. Fundamentals of Clinical Chemistry and Molecular Diagnostics. 8th ed. St. Louis: Elsevier; 2019.*

Course Title: Computer Applications in Healthcare	L	T	P	Cr
Course Code: BVT205	2	0	0	2

Total Hours 30

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

1. Understand the role of computers and information technology in healthcare.
2. Use basic computer applications (MS Office, data handling, presentations) in clinical and academic settings.
3. Explain electronic health records (EHRs), hospital information systems (HIS), and telemedicine.
4. Apply computer skills in medical data analysis, documentation, and reporting.
5. Recognize the importance of data security, confidentiality, and ethics in digital healthcare.

Course Contents

UNIT–I: Introduction to Computers & IT in Healthcare (10 Hours)

- Basics of computer hardware and software.
- Operating systems and file management.
- Role of IT in healthcare and hospital administration.
- Overview of healthcare information systems.

UNIT–II: Office Applications & Data Handling (10 Hours)

- MS Word: medical documentation, report preparation.
- MS Excel: creating tables, charts, and basic statistical functions for healthcare data.
- MS PowerPoint: preparing academic and clinical presentations.
- Introduction to databases (concept of patient records, lab results storage).

UNIT–III: Healthcare Information Systems (5 Hours)

- Electronic Health Records (EHRs).
- Hospital Information System (HIS).
- Laboratory Information System (LIS).

- Basics of Picture Archiving and Communication System (PACS) in radiology.

UNIT–IV: Emerging Technologies & Digital Ethics (5 Hours)

- Telemedicine and mobile health applications.
- Artificial intelligence and big data in healthcare (introductory concepts).
- Cybersecurity, patient confidentiality, and ethical issues in digital healthcare.
- Legal aspects of healthcare IT.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *SHORTLIFFE EH, CIMINO JJ. Biomedical Informatics: Computer Applications in Health Care and Biomedicine. 5th ed. New York: Springer; 2021.*
- *HOYT RE, YOSHII I. Health Informatics: Practical Guide for Healthcare and Information Technology Professionals. 7th ed. North Carolina: Lulu; 2019.*
- *KULKARNI V, KELKAR R. Hospital Information Systems: A Concise Study. New Delhi: PHI Learning; 2017.*
- *PANDYA A. Telemedicine: Principles and Practice. New Delhi: Jaypee Brothers; 2017.*
- *RIAZ A, RAUF A. Essentials of Medical Informatics. New Delhi: Jaypee Brothers; 2020.*
- *HAN J, KAMBER M, PEI J. Data Mining: Concepts and Techniques. 4th ed. Burlington: Morgan Kaufmann; 2022.*

Course Title: Anatomy & Physiology – II Practical	L	T	P	Cr.
Course Code: BVT206	0	0	4	2

Total Hours 60

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

1. Demonstrate practical knowledge of the cardiovascular, respiratory, digestive, and excretory systems.
2. Perform basic physiological experiments related to circulation, respiration, and excretion.
3. Record, analyze, and interpret normal physiological parameters.
4. Apply laboratory techniques in identifying structures, tissues, and physiological functions.
5. Correlate practical findings with theoretical knowledge of anatomy and physiology.

Course Content

List of Practicals / Experiments (60 Hours):

- Study of models/charts of the heart and blood vessels.
- Recording of pulse rate, blood pressure, and interpretation of findings.
- Study of cardiac sounds using stethoscope and preparation of clinical charts.
- Demonstration of ECG recording and interpretation of normal waves.
- Study of respiratory system models and charts.
- Demonstration of lung volumes and capacities using spirometry.
- Effect of exercise on pulse and respiration.
- Study of digestive system models (stomach, liver, pancreas, intestines).
- Test for salivary amylase activity.
- Study of excretory system models (kidney, nephron).
- Urine analysis: physical, chemical (protein, sugar, ketone), and microscopic examination.
- Histological study of cardiovascular, respiratory, digestive, and excretory organs (slides).

- Case-based demonstrations: hypertension, dyspnea, jaundice, renal failure (awareness level).
- Viva-voce and record maintenance of practical work.

Suggested Readings

- *CHAUDHARI SK. Practical Physiology. 3rd ed. New Delhi: CBS Publishers; 2017.*
- *GOPALAKRISHNAN C. Practical Physiology for Undergraduate Students. 2nd ed. New Delhi: Jaypee Brothers; 2019.*
- *BANERJEE PK. Practical Physiology with Viva Voce. 2nd ed. New Delhi: Jaypee Brothers; 2020.*
- *MARIEB EN, HOEHN K. Human Anatomy & Physiology Laboratory Manual. 12th ed. New York: Pearson; 2018.*
- *KESARI H. Textbook of Practical Physiology. 2nd ed. New Delhi: CBS Publishers; 2018.*
- *DATTA AK. Essentials of Human Anatomy (Vol I–III). 10th ed. Kolkata: Current Books International; 2018.*

Course Title: Basics of Anesthesia Technology Practical	L	T	P	Cr.
Course Code: BVT207	0	0	4	2

Total Hours 60

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

1. Identify, handle, and demonstrate the use of basic anesthesia equipment.
2. Practice preparation and maintenance of anesthesia machines and circuits.
3. Demonstrate airway management techniques using mannequins/models.
4. Apply basic monitoring methods used during anesthesia.
5. Follow safety protocols, sterilization, and infection control in the anesthesia workspace.

Course Content

List of Practicals / Experiments (60 Hours):

- Introduction to anesthesia work area and safety protocols.
- Identification and demonstration of anesthesia machine parts.
- Checking and calibration of anesthesia machine before use.
- Demonstration of breathing systems: open, semi-open, closed circuits.
- Handling and assembly of vaporizers, flowmeters, and oxygen cylinders.
- Demonstration of airway devices: oropharyngeal airway, nasopharyngeal airway, endotracheal tube, laryngeal mask airway.
- Endotracheal intubation practice on mannequins.
- Suction apparatus: operation, cleaning, and maintenance.
- Monitoring of vital parameters: ECG, pulse oximetry, BP measurement, capnography.
- Demonstration of intravenous cannulation and infusion setup (simulation).
- Handling of common anesthetic drugs and labeling.
- Sterilization and disinfection of anesthesia equipment.

- Emergency response drills: CPR and basic life support (BLS).
- Maintenance of logbook and viva-voce on practical work.

Suggested Readings

- *MILLER RD, COHEN NH, ERIKSSON LI, FLEISHER LA, WIENER-KRONISH JP, YOUNG WL. Miller's Anesthesia. 9th ed. Philadelphia: Elsevier; 2020.*
- *BARASH PG, CULLEN BF, STOELTING RK, CAUDLE KE, STOCK MC, ORTIZ VE. Clinical Anesthesia. 9th ed. Philadelphia: Wolters Kluwer; 2021.*
- *JOSHI GP, CHUNG F. Essentials of Ambulatory Anesthesia. 2nd ed. New York: Springer; 2016.*
- *NIMMO AF, SMITH AF. Anaesthesia: A Very Short Introduction. Oxford: Oxford University Press; 2018.*
- *WYLIE WD, CHURCHILL-DAVIDSON HC, HUNTER JM, MAPLESON WW. Wylie & Churchill-Davidson's A Practice of Anesthesia. 9th ed. London: CRC Press; 2019.*
- *AMERICAN HEART ASSOCIATION. BLS Provider Manual. 2020 ed. Dallas: AHA; 2020.*

Course Title: Principles of Surgical Procedures Practical	L	T	P	Cr.
Course Code: BVT208	0	0	4	2

Total Hours 60

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

1. Identify and handle basic surgical instruments safely.
2. Demonstrate aseptic techniques including scrubbing, gowning, and gloving.
3. Assist in preparation of surgical trays and operation theatre setup.
4. Practice patient positioning and draping for common surgical procedures.
5. Apply knowledge of preoperative, intraoperative, and postoperative care in simulated/clinical settings.

Course Content

List of Practicals / Experiments (60 Hours):

- Orientation to operation theatre layout and zoning.
- Demonstration of hand hygiene and surgical scrubbing techniques.
- Practice of gowning and gloving.
- Identification, handling, and passing of basic surgical instruments (cutting, grasping, retracting, suturing).
- Preparation and arrangement of surgical trays for minor operations.
- Demonstration of sterilization techniques and packing of surgical instruments.
- Patient positioning for different surgical procedures (supine, prone, lithotomy, Trendelenburg).
- Preparation and draping of operative site.
- Demonstration of incision and suturing techniques on models/simulation pads.
- Hemostasis techniques: use of artery forceps, ligatures, and cautery (demonstration).
- Care and maintenance of electrosurgical equipment.

- Demonstration of preoperative patient preparation (consent, shaving, site marking).
- Postoperative patient monitoring in recovery area.
- Record-keeping and logbook maintenance for OT procedures.

Suggested Readings

- *SCHWARTZ SI, BRUNICARDI FC, ANDERSEN DK, BILLER BMK, DUNN DL, HUNTER JG, POLLOCK RE. Schwartz's Principles of Surgery. 11th ed. New York: McGraw-Hill; 2019.*
- *FARQUHARSON M, MORAN B. Farquharson's Textbook of Operative General Surgery. 10th ed. Boca Raton: CRC Press; 2014.*
- *KAPOOR A. Textbook of Surgical Instruments and Procedures. New Delhi: Jaypee Brothers; 2018.*
- *KAPLAN LJ. Essentials of General Surgery and Surgical Specialties. 6th ed. Philadelphia: Wolters Kluwer; 2019.*
- *BROCK A, NOLAN JP, COOPER G. Essential Surgical Skills. 5th ed. Oxford: Oxford University Press; 2021.*
- *BELL RH, HUNTER JG, PIERCE RA, editors. Surgical Skills Manual. Philadelphia: Elsevier; 2016.*

Course Title: Pathology & Clinical Laboratory Basics Practical	L	T	P	Cr.
Course Code: BVT209	0	0	4	2

Total Hours 60

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

1. Demonstrate safe collection, handling, and processing of clinical specimens.
2. Perform basic hematology, biochemistry, microbiology, and pathology laboratory tests.
3. Prepare and interpret simple blood smears and urine analysis reports.
4. Apply principles of biosafety, disinfection, and biomedical waste disposal.
5. Maintain laboratory records and correlate findings with common clinical conditions.

Course Content

List of Practicals / Experiments (60 Hours):

- Orientation to clinical laboratory setup, equipment, and safety protocols.
- Demonstration of venous and capillary blood collection methods (simulation).
- Preparation of peripheral blood smear and staining (Leishman/Giemsa).
- Hemoglobin estimation by Sahli's or automated method.
- Total leukocyte count (TLC) and differential leukocyte count (DLC).
- Erythrocyte sedimentation rate (ESR) determination.
- Packed cell volume (PCV) and RBC count (manual method).
- Demonstration of common biochemical tests:
    - Blood glucose (glucose oxidase method).
    - Serum urea and creatinine.
    - Liver function tests (bilirubin, transaminases – demonstration).
    - Urine analysis:
    - Physical examination (color, odor, specific gravity, volume).

  - Chemical examination (protein, glucose, ketone).
  - Microscopic examination (casts, crystals, pus cells, RBCs).
- Collection and processing of sputum and stool specimens.
- Gram staining and demonstration of acid-fast staining.
- Demonstration of histopathology techniques: fixation, tissue processing, and H&E staining (awareness level).
- Biomedical waste segregation and disposal as per protocols.
- Maintenance of logbook, report writing, and viva voce.

Suggested Readings

- *HARSH MOHAN. Textbook of Pathology. 8th ed. New Delhi: Jaypee Brothers; 2019.*
- *DUTTA S. Textbook of Pathology for Allied Health Science Students. 2nd ed. New Delhi: Jaypee Brothers; 2020.*
- *ROBBINS SL, COTRAN RS, KUMAR V. Robbins and Cotran Pathologic Basis of Disease. 10th ed. Philadelphia: Elsevier; 2020.*
- *HENRY JB. Clinical Diagnosis and Management by Laboratory Methods. 23rd ed. Philadelphia: Elsevier; 2017.*
- *MURRAY PR, ROSENTHAL KS, PFALLER MA. Medical Microbiology. 9th ed. Philadelphia: Elsevier; 2020.*
- *TIETZ NW. Fundamentals of Clinical Chemistry and Molecular Diagnostics. 8th ed. St. Louis: Elsevier; 2019.*

Course Title: Computer Applications in Healthcare Practical	L	T	P	Cr.
Course Code: BVT210	0	0	4	2

Total Hours 60

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

- Demonstrate proficiency in using computer applications (Word, Excel, PowerPoint) for healthcare documentation and reporting.
- Create, store, and manage patient-related data using spreadsheet and database tools.
- Prepare medical presentations and reports using appropriate software.
- Operate basic healthcare information systems (HIS, EHR, LIS) at a demonstration level.
- Apply principles of data security, confidentiality, and ethical use of IT in healthcare.

Course Content

List of Practicals / Experiments (60 Hours):

- Introduction to operating systems, file management, and folder organization.
- MS Word: creating clinical documents, inserting tables, images, and headers/footers.
- Formatting medical reports and using templates for healthcare documentation.
- MS Excel: creating worksheets for patient data entry.
- Applying formulas, functions (average, count, sum, if), and conditional formatting.
- Preparing charts/graphs for medical data visualization (BP trends, glucose monitoring).
- Generating basic statistics using Excel (mean, median, mode, standard deviation).
- MS PowerPoint: designing presentations for healthcare education/training.

- Use of animations, transitions, and multimedia in medical presentations.
- Introduction to databases – creating simple patient record tables.
- Demonstration of Hospital Information System (HIS) features.
- Demonstration of Electronic Health Records (EHR) software.
- Demonstration of Laboratory Information System (LIS).
- Awareness of Picture Archiving and Communication System (PACS) in radiology.
- Introduction to telemedicine platforms (case demonstration).
- Cybersecurity awareness: safe password practices, encryption basics, and data confidentiality in healthcare.
- Project work: creating a complete patient record set (Word for reporting, Excel for data, PowerPoint for case presentation).
- Viva-voce and practical record maintenance.

Suggested Readings

- *SHORTLIFFE EH, CIMINO JJ. Biomedical Informatics: Computer Applications in Health Care and Biomedicine. 5th ed. New York: Springer; 2021.*
- *HOYT RE, YOSHII I. Health Informatics: Practical Guide for Healthcare and Information Technology Professionals. 7th ed. North Carolina: Lulu; 2019.*
- *KULKARNI V, KELKAR R. Hospital Information Systems: A Concise Study. New Delhi: PHI Learning; 2017.*
- *RIAZ A, RAUF A. Essentials of Medical Informatics. New Delhi: Jaypee Brothers; 2020.*
- *PANDYA A. Telemedicine: Principles and Practice. New Delhi: Jaypee Brothers; 2017.*
- *HAN J, KAMBER M, PEI J. Data Mining: Concepts and Techniques. 4th ed. Burlington: Morgan Kaufmann; 2022.*

Course Title: Environmental Sciences	L	T	P	Cr
Course Code: BVT211	2	0	0	2

Total Hours 30

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

1. Explain the structure and functions of the environment and ecosystems.
2. Identify natural resources and discuss their sustainable use.
3. Understand environmental pollution, its causes, effects, and control measures.
4. Recognize the importance of biodiversity conservation and sustainable development.
5. Apply environmental awareness in healthcare, community health, and professional practice.

Course Contents

UNIT–I: Introduction & Natural Resources (10 Hours)

- Definition, scope, and importance of environmental studies.
- Components of the environment.
- Natural resources: forest, water, mineral, energy, and land resources.
- Role of individuals in conservation of natural resources.

UNIT–II: Ecosystems & Biodiversity (10 Hours)

- Concept of an ecosystem, structure, and function.
- Energy flow and ecological pyramids.
- Types of ecosystems: forest, grassland, desert, aquatic.
- Biodiversity: levels, value, threats, and conservation methods.

UNIT–III: Environmental Pollution (5 Hours)

- Types: air, water, soil, noise, radioactive pollution.
- Causes, effects, and control measures.
- Role of healthcare professionals in pollution awareness.

UNIT–IV: Social Issues & Human Health (5 Hours)

- Sustainable development and climate change.
- Global warming, ozone depletion, acid rain.

- Waste management: biomedical waste, solid waste, e-waste.
- Environmental ethics and public health.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

AGARWAL KC. Environmental Biology. New Delhi: Nidhi Publishers; 2001.

RAO MN, DATAR SV. Wastewater Treatment. Oxford: Oxford & IBH Publishing; 1987.

ODUM EP, BARRETT GW. Fundamentals of Ecology. 5th ed. Belmont: Cengage Learning; 2004.

RAO CS. Environmental Pollution Control Engineering. New Delhi: New Age International; 2006.

SHARMA PD. Ecology and Environment. 10th ed. Meerut: Rastogi Publications; 2019.

KAUSHIK A, KAUSHIK CP. Perspectives in Environmental Studies. 6th ed. New Delhi: New Age International; 2020.

Course Title: First Aid	L	T	P	Cr
Course Code: BVT212	2	0	0	2

Total Hours 30

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

1. Explain the basic principles and importance of first aid in emergency care.
2. Demonstrate immediate and effective response to common medical and surgical emergencies.
3. Perform basic life support (BLS) and cardiopulmonary resuscitation (CPR).
4. Apply safe techniques for wound care, bleeding control, fractures, burns, and poisoning.
5. Recognize when to provide first aid and when to seek advanced medical help.

Course Contents

UNIT–I: Introduction & Basic Principles of First Aid (10 Hours)

- Definition, scope, and objectives of first aid.
- First aid kit: contents and maintenance.
- Principles of patient assessment (DRABC – Danger, Response, Airway, Breathing, Circulation).
- First aid in fainting, shock, seizures, heat stroke, and hypothermia.

UNIT–II: Basic Life Support & CPR (10 Hours)

- Introduction to BLS and chain of survival.
- Cardiopulmonary resuscitation (adult, child, infant).
- Recovery position and airway management techniques.
- First aid for choking (Heimlich maneuver).
- Awareness of automated external defibrillator (AED).

UNIT–III: Wounds, Bleeding, Fractures & Burns (5 Hours)

- Types of wounds and bleeding.
- Control of bleeding (direct pressure, elevation, bandaging, tourniquet – awareness).

- First aid in fractures, sprains, and dislocations.
- First aid in burns, scalds, and electric shock.

UNIT–IV: Poisoning, Bites & Miscellaneous Emergencies (5 Hours)

- First aid in poisoning (ingestion, inhalation, injection, contact).
- Snake bite, dog bite, insect stings.
- First aid in drowning, near-drowning, and road traffic accidents.
- Transport of injured patients and shifting techniques.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *ST JOHN AMBULANCE, BRITISH RED CROSS, ST ANDREW'S FIRST AID. First Aid Manual. 11th ed. London: Dorling Kindersley; 2021.*
- *AMERICAN RED CROSS. First Aid/CPR/AED Participant's Manual. 2020 ed. Washington DC: American Red Cross; 2020.*
- *AMERICAN HEART ASSOCIATION. Basic Life Support (BLS) Provider Manual. 2020 ed. Dallas: AHA; 2020.*
- *KNIGHT B. Immediate First Aid: A Practical Guide. 6th ed. London: Hodder Arnold; 2018.*
- *TIWARI R. Textbook of First Aid and Emergency Nursing. New Delhi: Jaypee Brothers; 2017.*
- *ALEXANDER D. First Aid Manual for Nurses. London: Routledge; 2019.*

Semester 3rd

Course Title: Pharmacology & Emergency Drugs	L	T	P	Cr
Course Code: BVT301	2	0	0	2

Total Hours 30

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

1. Understand the general principles of pharmacology and drug actions.
2. Describe the classification, mechanism of action, therapeutic uses, and adverse effects of commonly used drugs.
3. Explain the pharmacology of drugs used in emergency situations.
4. Apply knowledge of emergency drugs in clinical and paramedical settings with emphasis on safe administration.
5. Recognize drug interactions, contraindications, and essential safety precautions.

Course Contents

UNIT I: General Pharmacology (10 Hours)

- Introduction to pharmacology, pharmacokinetics, and pharmacodynamics.
- Routes of drug administration.
- Factors modifying drug action.
- Adverse drug reactions and drug interactions.

UNIT II: Drugs Acting on Major Systems (10 Hours)

- Cardiovascular drugs: antihypertensives, antianginal drugs, diuretics.
- Respiratory drugs: bronchodilators, anti-asthmatic drugs.
- Central Nervous System drugs: analgesics, sedatives, anticonvulsants.
- Autonomic Nervous System drugs: sympathomimetics, parasympathomimetics, adrenergic blockers.

UNIT III: Emergency Drugs in Clinical Practice (5 Hours)

- Drugs used in cardiac emergencies (adrenaline, atropine, amiodarone).
- Drugs used in respiratory emergencies (salbutamol, aminophylline, hydrocortisone).
- Drugs for shock, anaphylaxis, and hypoglycemia.

UNIT IV: Practical Considerations & Safety (5 Hours)

- Preparation and administration of emergency drugs.
- Drug storage and stability.
- Legal and ethical aspects of drug administration.
- Safe handling of drugs in paramedical practice.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *Tripathi KD. Essentials of Medical Pharmacology. Jaypee Brothers Medical Publishers.*
- *Rang HP, Dale MM, Ritter JM, Flower RJ. Rang and Dale's Pharmacology. Churchill Livingstone.*
- *Katzung BG. Basic and Clinical Pharmacology. McGraw Hill.*
- *Sharma HL, Sharma KK. Principles of Pharmacology. Paras Medical Publisher.*
- *Goodman & Gilman's. The Pharmacological Basis of Therapeutics. McGraw Hill.*

Course Title: Anesthesia & Patient Monitoring – I	L	T	P	Cr
Course Code: BVT302	2	0	0	2

Total Hours 30

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

1. Explain the principles and types of anesthesia.
2. Understand the pharmacology and clinical use of anesthetic agents.
3. Describe the techniques of general and regional anesthesia.
4. Explain the principles of patient monitoring during anesthesia.
5. Recognize complications related to anesthesia and their management.

Course Contents

UNIT I: Introduction to Anesthesia (10 Hours)

- Definition and history of anesthesia.
- Classification: general, regional, and local anesthesia.
- Preoperative assessment and preparation of the patient.
- Anesthetic machine: basic components and functions.

UNIT II: General & Regional Anesthesia (10 Hours)

- General anesthesia: stages, induction, maintenance, recovery.
- Agents used: inhalational and intravenous anesthetics.
- Regional anesthesia: spinal, epidural, nerve block.
- Local anesthetics: types, mechanism of action, complications.

UNIT III: Patient Monitoring – Basics (5 Hours)

- Importance of patient monitoring during anesthesia.
- Monitoring of vital signs: heart rate, blood pressure, respiratory rate, oxygen saturation.
- Airway monitoring and ventilation assessment.

UNIT IV: Complications & Safety Measures (5 Hours)

- Common complications of anesthesia: hypotension, hypoxia, allergic reactions.
- Immediate management of anesthetic complications.
- Safety measures and infection control in the operation theatre.
- Role of paramedical staff in anesthesia and monitoring.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *Miller RD. Miller's Anesthesia. Elsevier.*
- *Morgan GE, Mikhail MS, Murray MJ. Clinical Anesthesiology. McGraw Hill.*
- *Barash PG, Cullen BF, Stoelting RK. Clinical Anesthesia. Wolters Kluwer.*
- *Stoelting RK, Hillier SC. Pharmacology and Physiology in Anesthetic Practice. Lippincott Williams & Wilkins.*
- *Gupta S. Essentials of Anesthesiology. Jaypee Brothers Medical Publishers.*

Course Title: Surgical Techniques & Instrumentation – I	L	T	P	Cr
Course Code: BVT303	2	0	0	2

Total Hours 30

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

1. Understand the principles of asepsis, sterilization, and operation theatre protocols.
2. Describe the classification, design, and use of basic surgical instruments.
3. Explain the principles of suturing, knotting, and wound management.
4. Identify and handle surgical instruments safely.
5. Demonstrate knowledge of preoperative, intraoperative, and postoperative surgical techniques.

Course Contents

UNIT I: Introduction to Surgery & Asepsis (10 Hours)

- Basics of surgery and surgical environment.
- Aseptic techniques and infection control.
- Sterilization methods and disinfection.
- Operation theatre layout and protocols.

UNIT II: Surgical Instruments – Basics (10 Hours)

- Classification of surgical instruments: cutting, grasping, clamping, retracting.
- Scalpels, scissors, forceps, needle holders.
- Surgical trays and instrument sets.
- Care, handling, and maintenance of instruments.

UNIT III: Surgical Techniques – I (5 Hours)

- Principles of incision and tissue handling.
- Basic suturing techniques and knot tying.

- Wound classification and healing process.

UNIT IV: Surgical Assistance & Safety (5 Hours)

- Role of paramedical staff in surgical procedures.
- Instrument passing techniques.
- Safety measures in the operation theatre.
- Prevention of sharps injury and biohazard management.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *Farquharson M, Moran B. Farquharson's Textbook of Operative General Surgery. CRC Press.*
- *Hamilton Bailey. Demonstrations of Physical Signs in Clinical Surgery. CRC Press.*
- *Chugh S. Textbook on Operation Theatre Techniques. Jaypee Brothers Medical Publishers.*
- *Schein M. Common Sense in Surgical Practice. Springer.*
- *Zinner MJ, Ashley SW. Maingot's Abdominal Operations. McGraw Hill.*

Course Title: Sterilization & Disinfection Techniques	L	T	P	Cr
Course Code: BVT304	2	0	0	2

Total Hours 30

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

1. Explain the principles of sterilization and disinfection.
2. Differentiate between sterilization and disinfection methods.
3. Describe physical, chemical, and biological methods of sterilization.
4. Identify appropriate sterilization techniques for different instruments, materials, and environments.
5. Apply infection control measures in clinical and surgical settings.
6. Ensure occupational safety and prevention of hospital-acquired infections.

Course Contents

UNIT I: Principles of Sterilization & Disinfection (10 Hours)

- Introduction, definitions, and significance in healthcare.
- Sources and types of healthcare-associated infections.
- Principles of asepsis and infection control.
- Levels of disinfection (high, intermediate, low).

UNIT II: Physical Methods of Sterilization (10 Hours)

- Heat sterilization: dry heat (hot air oven), moist heat (autoclave).
- Radiation sterilization: UV, gamma rays.
- Filtration methods: membrane filters, HEPA filters.
- Monitoring of sterilization effectiveness (biological and chemical indicators).

UNIT III: Chemical Methods of Disinfection (5 Hours)

- Alcohols, aldehydes, phenols, halogens, quaternary ammonium compounds.
- Gaseous sterilization: ethylene oxide, formaldehyde.

- Applications and limitations of chemical disinfectants.

UNIT IV: Practical Applications & Safety (5 Hours)

- Sterilization and disinfection of surgical instruments, linen, and endoscopes.
- Cleaning and preparation of instruments before sterilization.
- Safety precautions in handling sterilants and disinfectants.
- Waste management and biohazard disposal.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *Russell AD, Hugo WB, Ayliffe GAJ. Principles and Practice of Disinfection, Preservation and Sterilization. Blackwell Science.*
- *McDonnell G, Denver Russell A. Antiseptics and Disinfectants: Activity, Action, and Resistance. CRC Press.*
- *Rutala WA, Weber DJ. Disinfection, Sterilization, and Control of Hospital Waste. APIC.*
- *Block SS. Disinfection, Sterilization, and Preservation. Lippincott Williams & Wilkins.*
- *Gupta S. Manual of Infection Control Procedures. Jaypee Brothers Medical Publishers.*

Course Title: Basic Principle of Hospital Management	L	T	P	Cr
Course Code: BVT305	2	0	0	2

Total Hours 30

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

1. Understand the structure and functions of hospital management.
2. Describe the role of hospital administration in patient care services.
3. Explain the principles of planning, organizing, staffing, directing, and controlling in hospital settings.
4. Identify methods of quality assurance, patient safety, and resource management.
5. Apply basic management skills in healthcare and allied settings.

Course Contents

UNIT I: Introduction to Hospital Management (10 Hours)

- Concept and definition of hospital management.
- Types of hospitals (public, private, teaching, specialty).
- Roles and responsibilities of hospital administrators.
- Principles of management in healthcare.

UNIT II: Hospital Organization & Functions (10 Hours)

- Organizational structure of hospitals.
- Departments and their interrelationships (clinical, nursing, support, administrative).
- Human resource management in hospitals.
- Communication and coordination in hospital administration.

UNIT III: Hospital Operations & Services (5 Hours)

- Outpatient and inpatient services.
- Emergency and critical care management.
- Material management and supply chain in hospitals.
- Patient records and information management.

UNIT IV: Quality & Safety in Hospitals (5 Hours)

- Quality assurance in healthcare services.
- Accreditation standards (NABH, JCI – basics).
- Patient safety, infection control, and risk management.
- Ethical and legal aspects of hospital management.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *Sakharkar BM. Principles of Hospital Administration and Planning. Jaypee Brothers Medical Publishers.*
- *Goel SL, Kumar R. Hospital Administration and Management. Deep & Deep Publications.*
- *Gupta S, Kant S. Hospital Administration and Human Resource Management. Jaypee Brothers Medical Publishers.*
- *McKee M, Healy J. Hospitals in a Changing Europe. WHO Regional Publications.*
- *Reddy S. Essentials of Hospital Management and Administration. Paras Medical Publisher.*

Course Title: Pharmacology & Emergency Drugs Practical	L	T	P	Cr.
Course Code: BVT306	0	0	4	2

Total Hours 60

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

1. Demonstrate correct preparation and administration of common drugs.
2. Identify and interpret drug dosage forms, strengths, and labels.
3. Practice calculation of drug doses and IV infusion rates.
4. Demonstrate the use of emergency drugs in simulated clinical situations.
5. Follow safe handling, storage, and disposal practices for drugs.
6. Apply knowledge of pharmacology in patient care emergencies.

Course Content

List of Practicals / Experiments (60 Hours):

- Introduction to pharmacology lab, safety rules, and drug handling.
- Identification of common dosage forms (tablets, capsules, injectables, solutions, suspensions, etc.).
- Interpretation of drug labels: trade name, generic name, strength, expiry date, batch number.
- Calculation of drug doses and IV infusion rates.
- Preparation and administration of intramuscular, subcutaneous, and intravenous injections (mannequin/simulation).
- Demonstration of drug dilution techniques.
- Familiarization with emergency drug tray and crash cart.
- Preparation and use of adrenaline in cardiac arrest simulation.
- Preparation and administration of atropine in bradycardia simulation.
- Use of salbutamol and aminophylline in asthma/bronchospasm management (simulation).
- Demonstration of hydrocortisone in allergic reaction management.
- Administration of dextrose in hypoglycemia.

- Handling, storage, and disposal of emergency drugs.
- Case-based scenarios on management of shock, anaphylaxis, and seizures with drug intervention.
- OSCE-style evaluation of emergency drug handling and administration.

Suggested Readings

- *Tripathi KD. Essentials of Medical Pharmacology. Jaypee Brothers Medical Publishers.*
- *Katzung BG. Basic and Clinical Pharmacology. McGraw Hill.*
- *Rang HP, Dale MM. Pharmacology. Churchill Livingstone.*
- *Barar FSK. Essentials of Pharmacotherapeutics. S. Chand & Company.*
- *Parikh CK. Practical Pharmacology and Clinical Pharmacy. CBS Publishers.*

Course Title: Anesthesia & Patient Monitoring – I Practical	L	T	P	Cr.
Course Code: BVT307	0	0	4	2

Total Hours 60

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

1. Demonstrate knowledge of anesthesia equipment and monitoring devices.
2. Perform basic preoperative preparation and patient assessment (simulation).
3. Identify, assemble, and check anesthesia machines and circuits.
4. Demonstrate safe handling of airways, masks, and endotracheal tubes.
5. Monitor and record vital parameters during anesthesia.
6. Recognize common anesthesia-related complications in simulation and suggest corrective actions.

Course Content

List of Practicals / Experiments (60 Hours):

- Introduction to anesthesia lab: safety rules and infection control.
- Identification of anesthesia machine parts and circuits.
- Checking and calibration of anesthesia machine (pre-use check).
- Identification and handling of face masks, oropharyngeal airway, and laryngoscope.
- Demonstration of endotracheal tubes and their uses.
- Techniques of bag–mask ventilation on mannequin/simulator.
- Demonstration of spinal and epidural anesthesia kits.
- Study of intravenous anesthetic agents (simulated preparation and labeling).
- Study of inhalational anesthetic agents and vaporizers.
- Monitoring of pulse rate, respiratory rate, and blood pressure.
- Demonstration of ECG monitoring and interpretation of basic rhythms.
- Demonstration of pulse oximeter and capnograph.
- Simulation of induction and recovery phases of anesthesia.

- Recognition and simulated management of complications: hypoxia, hypotension, and airway obstruction.
- OSCE-based evaluation: equipment identification, machine check, patient monitoring charting.

Suggested Readings

- *Miller RD. Miller's Anesthesia. Elsevier.*
- *Morgan GE, Mikhail MS, Murray MJ. Clinical Anesthesiology. McGraw Hill.*
- *Barash PG, Cullen BF, Stoelting RK. Clinical Anesthesia. Wolters Kluwer.*
- *Gupta S. Essentials of Anesthesiology. Jaypee Brothers Medical Publishers.*
- *Hines RL, Marschall KE. Stoelting's Anesthesia and Co-Existing Disease. Elsevier.*

Course Title: Surgical Techniques & Instrumentation – I Practical	L	T	P	Cr.
Course Code: BVT308	0	0	4	2

Total Hours 60

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

1. Identify and classify basic surgical instruments.
2. Demonstrate correct handling, passing, and maintenance of instruments.
3. Practice basic surgical techniques including incision, suturing, and knot tying on models/simulators.
4. Apply aseptic techniques and infection prevention practices.
5. Assist effectively in simulated minor surgical procedures.

Course Content

List of Practicals / Experiments (60 Hours):

- Introduction to surgical lab: safety, asepsis, and infection control.
- Identification and classification of surgical instruments (cutting, grasping, retracting, clamping).
- Demonstration of scalpels, scissors, and forceps.
- Handling and maintenance of surgical instruments.
- Preparation of surgical trays and instrument sets.
- Demonstration of sterilization and packaging of instruments.
- Draping techniques and preparation of sterile field.
- Principles of instrument passing during surgery.
- Practice of surgical knots (single-hand, double-hand, and instrument knot tying).
- Practice of basic suturing techniques on models (interrupted, continuous, mattress sutures).
- Techniques of incision and tissue handling (simulation).
- Demonstration of wound classification and management.
- Assisting in simulated minor surgical procedures (abscess drainage, biopsy, etc.).

- Prevention of sharps injury and biomedical waste disposal.
- OSCE-based evaluation: instrument identification, suturing, and sterile field preparation.

Suggested Readings

- *Farquharson M, Moran B. Farquharson's Textbook of Operative General Surgery. CRC Press.*
- *Chugh S. Textbook on Operation Theatre Techniques. Jaypee Brothers Medical Publishers.*
- *Hamilton Bailey. Demonstrations of Physical Signs in Clinical Surgery. CRC Press.*
- *Schein M. Common Sense in Surgical Practice. Springer.*
- *Zinner MJ, Ashley SW. Maingot's Abdominal Operations. McGraw Hill.*

Course Title: Sterilization & Disinfection Techniques Practical	L	T	P	Cr.
Course Code: BVT309	0	0	4	2

Total Hours 60

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

1. Demonstrate knowledge of aseptic techniques in a clinical/lab environment.
2. Operate and monitor sterilization equipment (autoclave, hot air oven, etc.).
3. Apply appropriate methods of sterilization/disinfection for different instruments and materials.
4. Test and validate sterilization effectiveness using physical, chemical, and biological indicators.
5. Practice safe handling, storage, and disposal of sterilants, disinfectants, and biomedical waste.

Course Content

List of Practicals / Experiments (60 Hours):

- Introduction to asepsis, infection control, and laboratory safety.
- Demonstration of cleaning and preparation of instruments prior to sterilization.
- Operation of autoclave: loading, cycle setting, and monitoring.
- Use of hot air oven for dry heat sterilization.
- Demonstration of chemical disinfection (alcohols, phenolics, chlorine compounds).
- Gaseous sterilization (simulation/observation of ethylene oxide system).
- Demonstration of filtration methods for sterilization of liquids.
- Familiarization with UV sterilization methods.
- Use of biological indicators (spore strips) for validation of autoclave cycles.
- Use of chemical indicators (tape/strips) for monitoring sterilization.

- Demonstration of preparation and dilution of disinfectant solutions.
- Testing disinfectant efficacy (Rideal–Walker or similar test).
- Demonstration of fumigation and surface disinfection techniques.
- Safe handling, storage, and disposal of sterilants and disinfectants.
- Biomedical waste segregation and disposal in compliance with hospital protocols.

Suggested Readings

- *Russell AD, Hugo WB, Ayliffe GAJ. Principles and Practice of Disinfection, Preservation and Sterilization. Blackwell Science.*
- *Block SS. Disinfection, Sterilization, and Preservation. Lippincott Williams & Wilkins.*
- *McDonnell G, Russell AD. Antiseptics and Disinfectants: Activity, Action, and Resistance. CRC Press.*
- *Rutala WA, Weber DJ. Disinfection, Sterilization, and Control of Hospital Waste. APIC.*
- *Gupta S. Manual of Infection Control Procedures. Jaypee Brothers Medical Publishers.*

Course Title: Basic Principle of Hospital Management Practical	L	T	P	Cr.
Course Code: BVT310	0	0	4	2

Total Hours 60

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

1. Demonstrate understanding of hospital organizational structure and departmental functions.
2. Prepare and manage patient records, duty rosters, and basic hospital documentation.
3. Apply principles of patient flow management in OPD, IPD, and emergency services.
4. Identify and practice hospital quality and safety protocols.
5. Participate in simulation of hospital administrative tasks.

Course Content

List of Practicals / Experiments (60 Hours):

- Introduction to hospital departments and their functions (simulation/visit-based).
- Preparation of organizational charts for a hospital.
- Preparation of duty rosters for doctors, nurses, and paramedical staff.
- Demonstration of patient admission, transfer, and discharge procedures.
- Maintenance of medical records and patient case sheets.
- Demonstration of OPD registration and patient flow management.
- Preparation of inventory and stock registers for hospital supplies.
- Observation of emergency room workflow and triage system.
- Preparation of referral and feedback forms.
- Demonstration of quality assurance checklists (hand hygiene, patient identification, safety protocols).
- Introduction to NABH/JCI accreditation basics (simulation exercise).
- Case studies on hospital management issues (e.g., resource shortage, patient complaints).

- Demonstration of biomedical waste management records.
- Preparation of staff duty charts and shift rotations.
- OSCE-style evaluation on hospital record keeping, duty rosters, and patient flow mapping.

Suggested Readings

- *Sakharkar BM. Principles of Hospital Administration and Planning. Jaypee Brothers Medical Publishers.*
- *Goel SL, Kumar R. Hospital Administration and Management. Deep & Deep Publications.*
- *Gupta S, Kant S. Hospital Administration and Human Resource Management. Jaypee Brothers Medical Publishers.*
- *Reddy S. Essentials of Hospital Management and Administration. Paras Medical Publisher.*
- *WHO. Manual on Hospital Planning and Management. World Health Organization.*

Course Title: Community Health & Primary Care	L	T	P	Cr
Course Code: BVT311	3	0	0	3

Total Hours 45

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

1. Understand the concept of health, disease, and determinants of health in the community.
2. Describe the structure and functioning of healthcare delivery systems in India.
3. Explain the principles and strategies of primary health care.
4. Identify common community health problems and approaches for prevention and control.
5. Apply health education and promotion methods in community and primary care settings.

Course Contents

UNIT I: Concepts of Community Health (15 Hours)

- Definition of health, dimensions of health, indicators of health.
- Natural history of disease and levels of prevention.
- Determinants of health: biological, environmental, social, and behavioral.
- Health for all and Sustainable Development Goals (SDGs).

UNIT II: Primary Health Care & Health System (10 Hours)

- Principles of primary health care (equity, community participation, intersectoral coordination, appropriate technology).
- Structure and functions of healthcare delivery system in India: Sub-centre, PHC, CHC, District Hospital.
- National Health Mission and allied health programs.
- Role of health workers and multipurpose workers in primary care.

UNIT III: Community Health Problems & Control (10 Hours)

- Communicable diseases: tuberculosis, malaria, diarrheal diseases, ARI, HIV/AIDS.
- Non-communicable diseases: hypertension, diabetes, cancer, mental health.
- Maternal and child health services.
- Nutrition and health problems related to malnutrition, anemia, obesity.

UNIT IV: Health Promotion & Education (10 Hours)

- Principles and methods of health education and communication.
- School health programs and occupational health services.
- Role of NGOs and community participation in health.
- Record keeping, reporting, and use of health data for planning.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *Park K. Park's Textbook of Preventive and Social Medicine. Bhanot Publishers.*
- *Mahajan BK, Gupta MC. Textbook of Preventive and Social Medicine. Jaypee Brothers.*
- *Rao M. Principles of Community Medicine. Orient Blackswan.*
- *Kishore J. National Health Programs of India. Century Publications.*
- *WHO. Primary Health Care: Report of the International Conference on Primary Health Care, Alma-Ata 1978. WHO.*

Semester 4th

Course Title: Anesthesia & Patient Monitoring – II	L	T	P	Cr
Course Code: BVT401	2	0	0	2

Total Hours 30

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

1. Explain the pharmacology and clinical application of various anesthetic agents.
2. Describe advanced techniques in anesthesia administration.
3. Demonstrate knowledge of invasive and non-invasive patient monitoring systems.
4. Recognize complications and emergency management in anesthesia practice.
5. Apply patient safety measures and ethical considerations in anesthetic practice.

Course Contents

UNIT I – Advanced Concepts of Anesthesia (10 Hours)

- Review of anesthesia techniques: general, regional, and local anesthesia.
- Pharmacology of intravenous and inhalational anesthetic agents.
- Balanced anesthesia and multimodal analgesia.
- Pre-operative patient evaluation and preparation.

UNIT II – Patient Monitoring Systems (10 Hours)

- Principles of invasive monitoring: arterial line, central venous pressure, pulmonary artery catheter.
- Non-invasive monitoring: pulse oximetry, ECG, capnography, NIBP, BIS monitoring.
- Monitoring depth of anesthesia.
- Advances in monitoring technology and integration with anesthesia workstations.

UNIT III – Anesthetic Emergencies (5 Hours)

- Recognition and management of complications: malignant hyperthermia, anaphylaxis, cardiac arrest under anesthesia.
- Airway management and difficult airway algorithms.
- Post-anesthetic recovery and PACU monitoring.

UNIT IV – Patient Safety & Ethical Considerations (5 Hours)

- Safety protocols in anesthesia practice.
- Infection control and aseptic techniques in anesthetic procedures.
- Ethical issues and legal responsibilities in anesthesia and patient monitoring.
- Quality assurance and audit in anesthesia practice.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *Miller RD, Eriksson LI, Fleisher LA, Wiener-Kronish JP, Cohen NH, Young WL. Miller's Anesthesia. 9th ed. Philadelphia: Elsevier; 2020.*
- *Morgan GE, Mikhail MS, Murray MJ, Larson CP. Clinical Anesthesiology. 6th ed. McGraw-Hill; 2018.*
- *Barash PG, Cullen BF, Stoelting RK, Cahalan MK, Stock MC, Ortega R, et al. Clinical Anesthesia. 9th ed. Wolters Kluwer; 2021.*
- *Aitkenhead AR, Smith G, Rowbotham DJ. Textbook of Anaesthesia. 7th ed. Churchill Livingstone; 2017.*
- *Ehrenwerth J, Eisenkraft JB, Berry JM. Anesthesia Equipment: Principles and Applications. 3rd ed. Elsevier; 2020.*

Course Title: Surgical Techniques & Instrumentation – II	L	T	P	Cr
Course Code: BVT402	2	0	0	2

Total Hours 30

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

1. Describe advanced surgical techniques and their clinical applications.
2. Identify and explain the use of specialized surgical instruments.
3. Understand principles of minimally invasive and laparoscopic surgery.
4. Recognize surgical complications and their management strategies.
5. Apply aseptic techniques, sterilization methods, and patient safety measures in surgical practice.

Course Contents

UNIT I – Advanced Surgical Techniques (10 Hours)

- Principles of hemostasis and wound closure.
- Surgical sutures, staplers, clips, and adhesives.
- Principles of laparotomy and thoracotomy.
- Use of surgical drains and catheters.

UNIT II – Specialized Surgical Instrumentation (10 Hours)

- Instruments for general surgery (retractors, forceps, scissors, clamps).
- Instruments for cardiovascular, orthopedic, and neurosurgery.
- Electrosurgical units and cautery.
- Surgical microscopes, lasers, and robotics in surgery.

UNIT III – Minimally Invasive Surgery (5 Hours)

- Basics of laparoscopic and thoracoscopic surgery.
- Instruments and equipment for endoscopic procedures.
- Advantages and limitations of minimally invasive techniques.

UNIT IV – Safety, Sterilization & Complications (5 Hours)

- Sterilization and disinfection methods.
- Maintenance and care of surgical instruments.
- Surgical site infections and prevention strategies.
- Patient safety and ethical considerations in surgical practice.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- Ellis H, Calne RY, Watson CJE. Lecture Notes: General Surgery. 12th ed. Wiley-Blackwell; 2016.
- Zollinger RM, Ellison EC. Zollinger's Atlas of Surgical Operations. 10th ed. McGraw-Hill; 2021.
- Brunicardi FC, Andersen DK, Billiar TR, Dunn DL, Hunter JG, Matthews JB, et al. Schwartz's Principles of Surgery. 12th ed. McGraw-Hill; 2022.
- Brooks A, Mahoney PF, Cotton BA. Emergency Surgery. 2nd ed. Wiley-Blackwell; 2010.
- Greenberg JA. Surgical Instrumentation: An Interactive Approach. 3rd ed. Jones & Bartlett Learning; 2019.

Course Title: Radiology & Imaging for OT Technologists	L	T	P	Cr
Course Code: BVT403	2	0	0	2

Total Hours 30

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

1. Understand the principles of radiology and medical imaging relevant to operation theatre (OT) practice.
2. Identify common imaging modalities and their applications during surgical procedures.
3. Assist in safe positioning of patients for intraoperative radiological investigations.
4. Apply knowledge of radiation safety measures in the OT environment.
5. Correlate imaging findings with surgical requirements and patient management.

Course Contents

UNIT I – Basics of Radiology & Imaging (10 Hours)

- Fundamentals of X-rays: production, properties, and interaction with matter.
- Overview of imaging modalities: X-ray, CT, MRI, Ultrasound, and Fluoroscopy.
- Role of imaging in pre-operative, intra-operative, and post-operative care.

UNIT II – Imaging Applications in OT (10 Hours)

- Use of C-arm and fluoroscopy in surgical procedures (orthopedic, cardiac, neurosurgery).
- Intraoperative ultrasound and its applications.
- Image-guided surgeries and interventional radiology in OT.
- Contrast media: types, indications, and precautions.

UNIT III – Patient Positioning & Assistance (5 Hours)

- Radiographic positioning for intraoperative imaging.
- Role of OT technologists in assisting surgeons and radiologists.

- Care and monitoring of patients during imaging procedures.

UNIT IV – Radiation Protection & Safety (5 Hours)

- Principles of radiation protection (ALARA).
- Use of protective devices: aprons, thyroid shields, goggles.
- Monitoring radiation dose in OT staff and patients.
- Infection control measures with imaging equipment.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *Bushong SC. Radiologic Science for Technologists: Physics, Biology, and Protection. 12th ed. Elsevier; 2020.*
- *Bontrager KL, Lampignano JP. Textbook of Radiographic Positioning and Related Anatomy. 9th ed. Elsevier; 2020.*
- *Grainger RG, Allison DJ, Adam A, Dixon AK. Grainger & Allison's Diagnostic Radiology. 7th ed. Elsevier; 2021.*
- *Herring W. Learning Radiology: Recognizing the Basics. 4th ed. Elsevier; 2021.*
- *Faulkner K, Wall BF. Radiation Protection in Diagnostic X-Ray Imaging. CRC Press; 2019.*

Course Title: Critical Care & ICU Management	L	T	P	Cr
Course Code: BVT404	2	0	0	2

Total Hours 30

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

1. Understand the organization, functioning, and protocols of Intensive Care Units (ICU).
2. Describe principles of critical care management, including airway, breathing, and circulation.
3. Apply knowledge of monitoring systems and life-support equipment used in ICU.
4. Recognize and manage common ICU emergencies and complications.
5. Demonstrate understanding of infection control, patient safety, and ethical practices in critical care.

Course Contents

UNIT I – Fundamentals of Critical Care (10 Hours)

- Introduction to ICU: types, design, staffing, and workflow.
- Basic principles of critical care: airway, ventilation, hemodynamic stabilization.
- Triage and admission criteria in ICU.
- Multidisciplinary team roles in critical care.

UNIT II – ICU Equipment & Monitoring (10 Hours)

- Ventilators: types, modes of ventilation, basic settings.
- Hemodynamic monitoring: invasive vs. non-invasive methods.
- Infusion pumps, defibrillators, and dialysis machines in ICU.
- Point-of-care testing and bedside imaging.

UNIT III – ICU Emergencies & Patient Care (5 Hours)

- Cardiac arrest and resuscitation (ACLS basics).
- Shock, sepsis, and multi-organ dysfunction.
- Nutrition and fluid management in critically ill patients.
- Pain, sedation, and delirium management.

UNIT IV – Safety, Ethics & Quality in ICU (5 Hours)

- Infection control practices in ICU.
- End-of-life care, palliative care, and ethical dilemmas.
- Patient and family communication in critical care.
- Quality assurance, audits, and patient safety indicators in ICU.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- Irwin RS, Rippe JM. Irwin and Rippe's Intensive Care Medicine. 9th ed. Wolters Kluwer; 2023.
- Marino PL. The ICU Book. 5th ed. Wolters Kluwer; 2019.
- Hall JB, Schmidt GA, Kress JP. Principles of Critical Care. 4th ed. McGraw-Hill; 2015.
- Parrillo JE, Dellinger RP. Critical Care Medicine: Principles of Diagnosis and Management in the Adult. 5th ed. Elsevier; 2019.
- Oh TE. Oh's Intensive Care Manual. 8th ed. Butterworth-Heinemann; 2018.

Course Title: Blood Transfusion & Transplant Technology	L	T	P	Cr
Course Code: BVT405	2	0	0	2

Total Hours 30

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

1. Explain the principles, indications, and safety protocols of blood transfusion.
2. Understand blood grouping, cross-matching, and component therapy.
3. Describe transfusion-transmitted infections and adverse reactions.
4. Discuss the fundamentals of transplant immunology and organ transplantation techniques.
5. Apply ethical, legal, and safety aspects in transfusion medicine and transplant procedures.

Course Contents

UNIT I – Basics of Blood Transfusion (10 Hours)

- History and importance of transfusion medicine.
- Blood groups and Rh system.
- Blood collection, storage, and preservation.
- Cross-matching and compatibility testing.

UNIT II – Blood Components & Safety (10 Hours)

- Component separation: packed cells, plasma, platelets, cryoprecipitate.
- Indications and uses of blood components.
- Transfusion reactions: types, recognition, and management.
- Transfusion-transmitted infections and preventive strategies.

UNIT III – Basics of Transplant Technology (5 Hours)

- Principles of transplant immunology.
- Types of transplantation: autograft, allograft, xenograft.
- Role of HLA typing and tissue matching.

- Common organ transplants: kidney, liver, heart, cornea.

UNIT IV – Ethics, Safety & Regulations (5 Hours)

- Ethical and legal issues in transfusion and transplantation.
- National and international guidelines (NACO, WHO).
- Donor selection and counseling.
- Patient safety and infection control measures**.**

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *Harmening DM. Modern Blood Banking and Transfusion Practices. 7th ed. F.A. Davis; 2018.*
- *Roback JD, Combs MR, Grossman BJ, Hillyer CD. Technical Manual, AABB. 20th ed. AABB Press; 2020.*
- *Klein HG, Anstee DJ. Mollison's Blood Transfusion in Clinical Medicine. 12th ed. Wiley-Blackwell; 2014.*
- *Turgeon ML. Immunology and Serology in Laboratory Medicine. 6th ed. Elsevier; 2019.*
- *Tan HP, Marcos A, Shapiro R. Living Donor Organ Transplantation. CRC Press; 2019.*

Course Title: Advanced Patient Care & Pain Management	L	T	P	Cr.
Course Code: BVT406	2	0	0	2

Total Hours 30

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

1. Demonstrate knowledge of advanced nursing and patient care practices in hospital and critical care settings.
2. Explain the physiology of pain and various pain assessment tools.
3. Apply pharmacological and non-pharmacological methods of pain management.
4. Recognize complications in patient care and provide appropriate interventions.
5. Integrate ethical principles, patient communication, and empathy in care delivery.

Course Contents

UNIT I – Advanced Patient Care Practices (10 Hours)

- Principles of holistic patient care.
- Pre-operative and post-operative care.
- ICU and critical care nursing protocols.
- Fluid, electrolyte, and nutritional management in hospitalized patients.

UNIT II – Pain: Physiology & Assessment (10 Hours)

- Pathophysiology of pain: acute vs. chronic pain.
- Pain perception and pain pathways.
- Pain assessment scales and tools (VAS, NRS, Wong-Baker).
- Psychological aspects of pain in patients.

UNIT III – Pain Management Strategies (5 Hours)

- Pharmacological management: NSAIDs, opioids, adjuvants.
- Regional anesthesia and nerve blocks for pain relief.
- Non-pharmacological approaches: physiotherapy, TENS, cognitive-behavioral therapy, relaxation techniques.

UNIT IV – Safety, Ethics & Communication (5 Hours)

- Monitoring patients under pain management protocols.

- Complications of pain therapy and their management.
- Ethical and legal considerations in pain management.
- Communication, empathy, and counseling in patient care.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *McCaffery M, Pasero C. Pain: Clinical Manual. 2nd ed. Mosby; 1999.*
- *Barash PG, Cullen BF, Stoelting RK. Clinical Anesthesia. 9th ed. Wolters Kluwer; 2021.*
- *Pasero C, McCaffery M. Pain Assessment and Pharmacologic Management. Mosby Elsevier; 2011.*
- *Hall JE. Guyton and Hall Textbook of Medical Physiology. 14th ed. Elsevier; 2021.*
- *Lewis SL, Bucher L, Heitkemper MM, Harding MM. Medical-Surgical Nursing: Assessment and Management of Clinical Problems. 11th ed. Elsevier; 2019.*

Course Title: Anesthesia & Patient Monitoring – II Practical	L	T	P	Cr.
Course Code: BVT407	0	0	4	2

Total Hours 60

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

1. Demonstrate pre-anesthetic preparation and patient assessment techniques.
2. Operate anesthesia machines and monitoring equipment in simulated/clinical setups.
3. Perform basic and advanced airway management techniques.
4. Apply invasive and non-invasive monitoring methods during anesthesia.
5. Recognize anesthetic emergencies and perform appropriate interventions.
6. Follow safety protocols and infection control measures in anesthesia practice.

Course Content

List of Practicals / Experiments (60 Hours):

- Pre-anesthetic patient evaluation and preparation.
- Identification and handling of anesthesia equipment (machines, vaporizers, circuits).
- Demonstration of oxygen supply systems and scavenging units.
- Airway management: mask ventilation, oral and nasal airway insertion.
- Endotracheal intubation (simulation-based/manikin practice).
- Laryngeal mask airway (LMA) insertion.
- Monitoring of vital parameters: ECG, NIBP, pulse oximetry, temperature.
- Capnography demonstration and interpretation.
- Arterial blood pressure monitoring – invasive method demonstration.
- Central venous pressure (CVP) monitoring – setup and procedure.

- Patient positioning during anesthesia (supine, prone, lithotomy, Trendelenburg).
- Use of infusion pumps and syringe pumps in anesthesia.
- Recognition and management of common anesthetic emergencies (simulation drills).
- Post-anesthesia care and monitoring in PACU.
- Safety protocols: infection control, sterilization of anesthesia equipment, waste disposal.

Suggested Readings

- *Miller RD, Eriksson LI, Fleisher LA, Wiener-Kronish JP, Cohen NH, Young WL. Miller's Anesthesia. 9th ed. Elsevier; 2020.*
- *Morgan GE, Mikhail MS, Murray MJ, Larson CP. Clinical Anesthesiology. 6th ed. McGraw-Hill; 2018.*
- *Barash PG, Cullen BF, Stoelting RK, Cahalan MK, Stock MC, Ortega R, et al. Clinical Anesthesia. 9th ed. Wolters Kluwer; 2021.*
- *Ehrenwerth J, Eisenkraft JB, Berry JM. Anesthesia Equipment: Principles and Applications. 3rd ed. Elsevier; 2020.*
- *Nagelhout JJ, Plaus KL. Nurse Anesthesia. 6th ed. Elsevier; 2018.*

Course Title: Surgical Techniques & Instrumentation – II Practical	L	T	P	Cr.
Course Code: BVT408	0	0	4	2

Total Hours 60

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

1. Identify, handle, and maintain specialized surgical instruments.
2. Demonstrate aseptic techniques and sterilization methods in OT.
3. Assist in basic and advanced surgical procedures through instrument handling.
4. Perform surgical suturing and wound closure techniques on models/simulations.
5. Apply knowledge of minimally invasive instruments and procedures.
6. Follow OT safety protocols, infection control, and patient safety measures.

Course Content

List of Practicals / Experiments (60 Hours):

- Identification of general surgical instruments (scalpels, scissors, forceps, retractors, clamps).
- Identification and handling of specialized instruments (orthopedic, neurosurgical, cardiovascular sets).
- Demonstration of electrosurgical and cautery equipment.
- Sterilization techniques: autoclaving, ETO, chemical sterilization.
- Packing and storage of surgical instrument sets.
- Demonstration of scrub, gowning, and gloving techniques.
- Principles and practice of suturing: interrupted, continuous, mattress, subcuticular.
- Handling surgical staplers and skin clips.
- Use of surgical drains and catheters.
- Demonstration of laparoscopic instruments (trocars, graspers, camera, insufflator).
- Endoscopic instruments: basics and handling.

- Use of surgical microscope and basics of microsuturing (simulation).
- Instrument care, cleaning, and maintenance protocols.
- OT safety drills: prevention of burns, electrical hazards, fire safety.
- Simulation of instrument passing techniques and teamwork in OT.

Suggested Readings

- *Greenberg JA. Surgical Instrumentation: An Interactive Approach. 3rd ed. Jones & Bartlett; 2019.*
- *Ellis H. Surgical Instruments and Their Recognition. 12th ed. Butterworth-Heinemann; 2018.*
- *Zollinger RM, Ellison EC. Zollinger's Atlas of Surgical Operations. 10th ed. McGraw-Hill; 2021.*
- *Kirk RM, Winslet MC. Essential General Surgical Operations. 5th ed. Churchill Livingstone; 2019.*
- *Phillips N. Berry & Kohn's Operating Room Technique. 14th ed. Elsevier; 2020.*

Course Title: Radiology & Imaging for OT Technologists Practical	L	T	P	Cr.
Course Code: BVT409	0	0	4	2

Total Hours 60

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

1. Demonstrate safe handling and operation of basic imaging equipment in the OT.
2. Assist in intraoperative radiological procedures using C-arm and fluoroscopy.
3. Perform patient positioning for various radiographic examinations in surgical settings.
4. Apply principles of radiation protection for patients, staff, and self.
5. Maintain and follow infection control and equipment care protocols in OT radiology.

Course Content

List of Practicals / Experiments (60 Hours):

- Identification of radiology equipment used in OT (C-arm, portable X-ray, ultrasound).
- Demonstration of C-arm setup, calibration, and safe operation.
- Patient positioning for intraoperative imaging: orthopedic, spine, and trauma cases.
- Use of fluoroscopy in OT: basics and safety measures.
- Demonstration of intraoperative ultrasound applications.
- Handling of portable X-ray units in OT environment.
- Contrast media preparation and precautions in OT.
- Image acquisition and quality check during surgery.
- Infection control measures while using imaging equipment in OT.
- Demonstration of radiation protection measures: aprons, thyroid shields, goggles.
- Monitoring radiation exposure with dosimeters.
- Application of ALARA principle in OT.

- Simulation of teamwork between surgeons, anesthesiologists, and radiology technologists.
- Troubleshooting common technical issues with C-arm/portable units.
- Equipment cleaning, disinfection, and maintenance protocols.

Suggested Readings

- *Bushong SC. Radiologic Science for Technologists: Physics, Biology, and Protection. 12th ed. Elsevier; 2020.*
- *Bontrager KL, Lampignano JP. Textbook of Radiographic Positioning and Related Anatomy. 9th ed. Elsevier; 2020.*
- *Grainger RG, Allison DJ, Adam A, Dixon AK. Grainger & Allison's Diagnostic Radiology. 7th ed. Elsevier; 2021.*
- *Faulkner K, Wall BF. Radiation Protection in Diagnostic X-Ray Imaging. CRC Press; 2019.*
- *Smith H, Hansell D. Imaging for Surgeons. 2nd ed. CRC Press; 2016.*

Course Title: Critical Care & ICU Management Practical	L	T	P	Cr.
Course Code: BVT410	0	0	4	2

Total Hours 60

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

1. Demonstrate skills in basic and advanced patient monitoring in ICU.
2. Operate and manage ICU equipment such as ventilators, infusion pumps, and defibrillators.
3. Perform airway management and resuscitation techniques.
4. Recognize and respond to critical care emergencies.
5. Apply infection control, patient safety, and ethical practices in ICU management.

Course Content

List of Practicals / Experiments (60 Hours):

- Orientation to ICU setup and equipment.
- Demonstration of infection control practices: hand hygiene, PPE, and isolation techniques.
- Use of monitoring devices: ECG, pulse oximeter, NIBP monitors.
- Arterial line setup and invasive blood pressure monitoring (demonstration).
- Central venous pressure (CVP) monitoring procedure.
- Operation of mechanical ventilators: modes, alarms, troubleshooting.
- Oxygen therapy devices: nasal cannula, masks, high-flow oxygen.
- Airway management: suctioning, oropharyngeal and nasopharyngeal airway insertion.
- Endotracheal intubation and extubation (simulation-based).
- Basic life support (BLS) and advanced cardiac life support (ACLS) drills.
- Use of defibrillator and cardioversion techniques.
- Infusion pumps and syringe pumps – setup and operation.
- Bedside ultrasonography and portable X-ray demonstration in ICU.
- Nutrition and fluid management in critically ill patients.

- Simulation of ICU emergency scenarios (shock, sepsis, cardiac arrest).

Suggested Readings

- *Marino PL. The ICU Book. 5th ed. Wolters Kluwer; 2019.*
- *Irwin RS, Rippe JM. Irwin and Rippe's Intensive Care Medicine. 9th ed. Wolters Kluwer; 2023.*
- *Oh TE. Oh's Intensive Care Manual. 8th ed. Butterworth-Heinemann; 2018.*
- *Hall JB, Schmidt GA, Kress JP. Principles of Critical Care. 4th ed. McGraw-Hill; 2015.*
- *Parrillo JE, Dellinger RP. Critical Care Medicine: Principles of Diagnosis and Management in the Adult. 5th ed. Elsevier; 2019.*

Course Title: Blood Transfusion & Transplant Technology Practical	L	T	P	Cr
Course Code: BVT411	0	0	4	2

Total Hours 60

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

1. **Perform blood grouping and cross-matching procedures.**
2. **Demonstrate safe handling, storage, and component preparation of blood.**
3. **Identify and manage transfusion reactions under supervision.**
4. **Apply donor screening, selection, and counseling protocols.**
5. **Understand the basics of tissue typing and transplant immunology techniques.**
6. **Follow ethical, legal, and biosafety guidelines in transfusion and transplant practice.**

Course Content

List of Practicals / Experiments (60 Hours):

- Introduction to blood bank setup and equipment.
- Blood collection procedure (demonstration).
- Blood grouping (ABO and Rh typing).
- Cross-matching and compatibility testing.
- Coombs' test (direct and indirect antiglobulin tests).
- Screening blood for transfusion-transmitted infections (HIV, HBV, HCV, syphilis, malaria).
- Component preparation: packed red cells, platelet concentrate, FFP, cryoprecipitate.
- Storage and preservation of blood and components.
- Identification and management of transfusion reactions (simulation-based).
- Donor selection, registration, and counseling.
- HLA typing basics and tissue compatibility testing (demonstration).
- Preparation for renal/liver transplant protocols (case discussion).

- Demonstration of plasmapheresis and leukapheresis procedures.
- Documentation, record keeping, and regulatory requirements in blood bank.
- Biosafety measures and infection control in transfusion/transplant units.

Suggested Readings

- *Harmening DM. Modern Blood Banking and Transfusion Practices. 7th ed. F.A. Davis; 2018.*
- *Roback JD, Combs MR, Grossman BJ, Hillyer CD. AABB Technical Manual. 20th ed. AABB Press; 2020.*
- *Klein HG, Anstee DJ. Mollison's Blood Transfusion in Clinical Medicine. 12th ed. Wiley-Blackwell; 2014.*
- *Turgeon ML. Immunology and Serology in Laboratory Medicine. 6th ed. Elsevier; 2019.*
- *Tan HP, Marcos A, Shapiro R. Living Donor Organ Transplantation. CRC Press; 2019.*

Course Title: Advanced Patient Care & Pain Management Practical	L	T	P	Cr
Course Code: BVT412	0	0	4	2

Total Hours 60

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

1. Demonstrate advanced nursing skills for pre-operative, intra-operative, and post-operative patient care.
2. Assess pain using standard pain assessment scales and tools.
3. Apply pharmacological and non-pharmacological methods for pain management.
4. Operate and monitor devices used in patient care and pain therapy (infusion pumps, PCA, TENS).
5. Recognize complications during pain management and provide appropriate interventions.
6. Practice communication, counseling, and ethical considerations in patient care.

Course Content

List of Practicals / Experiments (60 Hours):

- Patient assessment: vital signs, fluid balance charting, intake–output measurement.
- Pre-operative and post-operative patient care demonstration.
- Wound care and dressing techniques.
- Pain assessment using VAS, NRS, and Wong-Baker scales.
- Administration of analgesics (oral, IV, IM) – demonstration.
- Patient Controlled Analgesia (PCA) pump: setup and use.
- Use of infusion and syringe pumps in pain management.
- Demonstration of regional blocks and local infiltration (simulation/case discussion).
- Application of non-pharmacological pain management methods:
  - Relaxation techniques
  - Breathing exercises
  - Hot/cold therapy

- Guided imagery

- **Use of Transcutaneous Electrical Nerve Stimulation (TENS) unit.**
- **Monitoring patients under analgesic therapy and documenting observations.**
- **Communication and counseling skills for patients with acute/chronic pain.**
- **Simulation of managing complications of opioids and NSAIDs.**
- **Ethical considerations in end-of-life pain management.**
- **Safety protocols and infection control measures in advanced patient care.**

Suggested Readings

- *Pasero C, McCaffery M. Pain Assessment and Pharmacologic Management. Mosby Elsevier; 2011.*
- *McCaffery M, Pasero C. Pain: Clinical Manual. 2nd ed. Mosby; 1999.*
- *Lewis SL, Bucher L, Heitkemper MM, Harding MM. Medical-Surgical Nursing: Assessment and Management of Clinical Problems. 11th ed. Elsevier; 2019.*
- *Barash PG, Cullen BF, Stoelting RK. Clinical Anesthesia. 9th ed. Wolters Kluwer; 2021.*
- *Hall JE. Guyton and Hall Textbook of Medical Physiology. 14th ed. Elsevier; 2021.*

Semester 5th

Course Title: Advanced Anesthesia Techniques	L	T	P	Cr
Course Code: BVT501	2	0	0	2

Total Hours 30

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

1. Explain advanced anesthesia techniques and their clinical applications.
2. Compare different anesthesia methods used in surgical and critical care settings.
3. Demonstrate understanding of pharmacological agents used in advanced anesthesia practice.
4. Discuss patient monitoring, safety measures, and management of anesthesia-related complications.
5. Integrate knowledge for clinical decision-making in special surgical procedures.

Course Contents

UNIT I: Advanced Concepts in Anesthesia (10 Hours)

- Review of basic anesthesia principles
- Pharmacology of intravenous and inhalational agents
- Balanced anesthesia and multimodal analgesia
- Anesthesia machine advances and vaporizers

UNIT II: Techniques and Special Approaches (10 Hours)

- Regional anesthesia: spinal, epidural, caudal, and peripheral nerve blocks
- Advanced airway management (fiberoptic intubation, video laryngoscopy, supraglottic devices)
- Total intravenous anesthesia (TIVA)
- Anesthesia in laparoscopic and minimally invasive surgeries

UNIT III: Anesthesia in Special Situations (5 Hours)

- Pediatric anesthesia

- Obstetric anesthesia
- Geriatric anesthesia
- Anesthesia for high-risk patients (cardiac, renal, hepatic compromise)

UNIT IV: Safety, Monitoring & Complications (5 Hours)

- Advanced patient monitoring (hemodynamic, depth of anesthesia, neuromuscular monitoring)
- Perioperative complications and their management
- Crisis resource management and difficult airway algorithms
- Current trends in anesthesia safety and simulation training

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *Morgan GE, Mikhail MS, Murray MJ. Clinical Anesthesiology. 6th ed. McGraw-Hill; 2018.*
- *Miller RD, Cohen NH, Eriksson LI, et al. Miller's Anesthesia. 9th ed. Elsevier; 2020.*
- *Barash PG, Cullen BF, Stoelting RK, et al. Clinical Anesthesia. 9th ed. Wolters Kluwer; 2021.*
- *Nagelhout JJ, Plaus KL. Nurse Anesthesia. 6th ed. Elsevier; 2018.*
- *Aitkenhead AR, Smith G, Rowbotham DJ. Textbook of Anaesthesia. 7th ed. Elsevier; 2017.*
- *Ehrenwerth J, Eisenkraft JB, Berry JM. Anesthesia Equipment: Principles and Applications. 3rd ed. Elsevier; 2020.*

Course Title: Specialized Surgical Procedures	L	T	P	Cr
Course Code: BVT502	2	0	0	2

Total Hours 30

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

1. Describe the principles and protocols of commonly performed specialized surgical procedures.
2. Identify preoperative, intraoperative, and postoperative requirements for different surgeries.
3. Explain anesthesia considerations and patient monitoring during specialized surgeries.
4. Discuss complications, their prevention, and management strategies.
5. Integrate knowledge to support surgical teams in advanced and critical procedures.

Course Contents

UNIT I: Principles of Specialized Surgery (10 Hours)

- Overview of specialized surgical branches (neurosurgery, cardiac, orthopedic, transplant, oncology)
- Surgical asepsis and infection control in high-risk procedures
- Role of imaging and navigation in specialized surgeries
- Interdisciplinary team approach in complex surgical care

UNIT II: Neurosurgery and Cardiothoracic Surgery (10 Hours)

- Principles of neurosurgical procedures: craniotomy, spinal surgeries, stereotactic techniques
- Specialized anesthesia and monitoring in neurosurgery
- Cardiac surgery: CABG, valve replacement, minimally invasive cardiac surgery
- Thoracic procedures: lobectomy, pneumonectomy, esophageal surgery
- Cardiopulmonary bypass and extracorporeal circulation basics

UNIT III: Organ Transplant and Oncology Procedures (5 Hours)

- Renal, hepatic, and bone marrow transplantation basics
- Immunosuppression and perioperative care

- Surgical oncology: tumor excision, reconstructive procedures
- Multidisciplinary approach in cancer surgeries

UNIT IV: Laparoscopic, Robotic, and Minimally Invasive Surgery (5 Hours)

- Principles and equipment used in laparoscopic and robotic surgery
- Advantages, limitations, and safety considerations
- Emerging techniques in minimally invasive surgery
- Patient selection and postoperative outcomes

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *Sabiston DC, Townsend CM. Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice. 21st ed. Elsevier; 2021.*
- *Schwartz SI, Brunicardi FC, Andersen DK, et al. Schwartz's Principles of Surgery. 11th ed. McGraw-Hill; 2019.*
- *Kouchoukos NT, Blackstone EH, Doty DB, Hanley FL. Kirklin/Barratt-Boyes Cardiac Surgery. 4th ed. Elsevier; 2012.*
- *Winn HR. Youmans and Winn Neurological Surgery. 8th ed. Elsevier; 2022.*
- *Cameron JL, Cameron AM. Current Surgical Therapy. 14th ed. Elsevier; 2022.*
- *Cuschieri A, Steele RJC, Moossa AR. Essential Surgical Practice. 5th ed. CRC Press; 2015.*
- *Fischer JE, Bland KI. Mastery of Surgery. 7th ed. Wolters Kluwer; 2018.*

Course Title: OT Safety, Disaster & Emergency Management	L	T	P	Cr
Course Code: BVT503	2	0	0	2

Total Hours 30

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

1. Describe the principles of safety protocols in the Operation Theatre (OT).
2. Demonstrate knowledge of infection control, biomedical waste management, and occupational safety.
3. Apply disaster preparedness and emergency response strategies in surgical settings.
4. Recognize and manage critical incidents, fire hazards, and equipment-related emergencies in OT.
5. Collaborate effectively in disaster and mass casualty management.

Course Contents

UNIT I: OT Safety & Infection Control (10 Hours)

- Principles of OT design and safety standards
- Sterilization, disinfection, and aseptic protocols
- Biomedical waste management and regulatory guidelines
- Prevention of sharps injuries and occupational exposure
- Fire and electrical safety in the OT

UNIT II: Risk Management in OT (10 Hours)

- Identification and assessment of hazards in OT
- Handling anesthesia-related emergencies (malignant hyperthermia, anaphylaxis)
- Critical incident reporting and root cause analysis
- Safety in handling surgical instruments, energy sources (laser, cautery)
- Ergonomics and staff safety

UNIT III: Disaster Preparedness (5 Hours)

- Types of disasters: natural, chemical, biological, radiological, and nuclear (CBRN)
- Hospital disaster management plan (HDMP)
- Triage principles and protocols
- Communication and coordination during disasters

UNIT IV: Emergency Management in Healthcare (5 Hours)

- Mass casualty management in OT and emergency departments
- Role of OT staff in disaster drills and simulations
- Basic life support (BLS) and advanced cardiac life support (ACLS) protocols
- Psychological preparedness and stress management during emergencies

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *Mehta Y, George JV. Textbook of Operation Theatre and Anaesthesia Technology. Jaypee Brothers; 2021.*
- *WHO. Safe Surgery Saves Lives: The Second Global Patient Safety Challenge. WHO Press; 2009.*
- *Rothrock JC. Alexander's Care of the Patient in Surgery. 17th ed. Elsevier; 2022.*
- *Sharma D. Hospital and Emergency Disaster Preparedness. Jaypee Brothers; 2015.*
- *World Health Organization. Hospital Emergency Response Checklist. WHO Europe; 2011.*
- *American Heart Association. BLS and ACLS Provider Manuals. Latest edition.*

Course Title: Trauma & Cardiac Life Support	L	T	P	Cr
Course Code: BVT504	2	0	0	2

Total Hours 30

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

1. Explain the principles of trauma management and cardiac life support.
2. Demonstrate knowledge of Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS) protocols.
3. Apply primary and secondary survey in trauma care using ATLS guidelines.
4. Manage airway, breathing, circulation, and shock in trauma patients.
5. Recognize cardiac arrest rhythms and perform evidence-based resuscitation techniques.
6. Collaborate effectively in trauma and cardiac emergencies within OT and ICU settings.

Course Contents

UNIT I: Principles of Trauma Management (10 Hours)

- Overview of trauma systems and epidemiology
- Primary survey (Airway, Breathing, Circulation, Disability, Exposure – ABCDE)
- Secondary survey and documentation
- Hemorrhage control and shock management
- Initial management of head, chest, abdominal, and orthopedic trauma

UNIT II: Cardiac Arrest and Life Support Protocols (10 Hours)

- Pathophysiology of cardiac arrest
- Basic Life Support (BLS): adult, child, and infant protocols
- Advanced Cardiac Life Support (ACLS): airway management, defibrillation, drugs in resuscitation
- Recognition and management of cardiac rhythms (VT, VF, PEA, asystole)
- Post-resuscitation care and return of spontaneous circulation (ROSC)

UNIT III: Specialized Trauma & Cardiac Emergencies (5 Hours)

- Trauma in special populations: pediatric, geriatric, pregnant patients
- Spinal cord injuries and immobilization techniques
- Management of burns and polytrauma
- Acute coronary syndromes and myocardial infarction management

UNIT IV: Simulation, Team Dynamics & Recent Advances (5 Hours)

- Team-based resuscitation: roles and leadership in emergencies
- Crisis resource management in trauma and cardiac arrest
- Simulation-based training and mock drills
- Recent guidelines and updates (AHA, ATLS, ERC)

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *American College of Surgeons. Advanced Trauma Life Support (ATLS) Student Course Manual. 10th ed. ACS; 2018.*
- *American Heart Association. BLS Provider Manual. Latest Edition.*
- *American Heart Association. ACLS Provider Manual. Latest Edition.*
- *Tintinalli JE, Ma OJ, Yealy DM, et al. Tintinalli's Emergency Medicine: A Comprehensive Study Guide. 9th ed. McGraw-Hill; 2020.*
- *Cameron P, Jelinek G, Kelly AM, Brown AFT, Little M. Textbook of Adult Emergency Medicine. 5th ed. Elsevier; 2019.*
- *Walls RM, Hwang J, Murphy MF. Manual of Emergency Airway Management. 5th ed. Wolters Kluwer; 2018.*

Course Title: Medical Ethics & Legal Issues	L	T	P	Cr
Course Code: BVT505	3	0	0	3

Total Hours 45

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

1. Explain the fundamental principles of medical ethics and their application in clinical practice.
2. Analyze ethical dilemmas and apply ethical reasoning in decision-making.
3. Identify legal responsibilities of healthcare professionals in patient care.
4. Recognize medico-legal issues such as negligence, consent, confidentiality, and malpractice.
5. Understand national and international laws, policies, and professional codes governing healthcare.

Course Contents

UNIT I: Introduction to Medical Ethics (15 Hours)

- Definition, scope, and importance of medical ethics
- Principles of bioethics: autonomy, beneficence, non-maleficence, justice
- Professionalism, duty of care, and codes of conduct (MCI/NMC, WHO guidelines)
- Ethical decision-making in clinical practice
- Role of ethics committees and institutional review boards

UNIT II: Doctor–Patient Relationship & Consent (10 Hours)

- Models of doctor–patient relationship
- Informed consent: principles, process, and exceptions
- Confidentiality and right to privacy
- Truth-telling, disclosure of medical errors, and breaking bad news
- Ethical challenges in end-of-life care and palliative care

UNIT III: Legal Issues in Healthcare (10 Hours)

- Overview of medical law in India and international perspectives
- Medico-legal case (MLC): reporting, documentation, and responsibilities
- Medical negligence and malpractice: definitions, types, and consequences
- Consumer Protection Act and healthcare
- Legal aspects of organ transplantation, reproductive health, and mental health

UNIT IV: Contemporary Issues in Medical Ethics & Law (10 Hours)

- Research ethics: clinical trials, human experimentation, vulnerable populations
- Ethics in emerging technologies: AI in healthcare, telemedicine, genetic testing, stem cell therapy
- Ethical issues in critical care, transplantation, and assisted reproduction
- Disaster ethics and public health emergencies (pandemics, resource allocation)
- Global perspectives: UNESCO, WHO declarations, human rights in healthcare

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *Beauchamp TL, Childress JF. Principles of Biomedical Ethics. 8th ed. Oxford University Press; 2019.*
- *Indian Medical Council (Professional Conduct, Etiquette and Ethics) Regulations. Latest edition.*
- *Rao NG. Forensic Medicine and Medical Law. Jaypee Brothers; 2016.*
- *Pozgar GD. Legal and Ethical Issues for Health Professionals. 5th ed. Jones & Bartlett Learning; 2019.*
- *Sathe SS. Medico-Legal and Ethical Issues in Healthcare. Jaypee Brothers; 2017.*

- *World Health Organization. Standards and Operational Guidance for Ethics Review of Health-Related Research. WHO Press; 2011.*
- *UNESCO. Universal Declaration on Bioethics and Human Rights. UNESCO; 2005.*

Course Title: Research Methodology & Biostatistics	L	T	P	Cr
Course Code: BVT506	2	0	0	2

Total Hours 30

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

1. Understand the fundamental principles of research methodology in health sciences.
2. Identify and formulate research problems, hypotheses, and objectives.
3. Apply appropriate study designs and sampling techniques in biomedical research.
4. Perform basic statistical analyses and interpret results correctly.
5. Critically appraise scientific literature and prepare structured research reports.

Course Contents

UNIT I: Introduction to Research Methodology (10 Hours)

- Definition, need, and importance of research in health sciences.
- Types of research: Basic, applied, clinical, quantitative, qualitative.
- Research problem: Identification, statement, and formulation.
- Literature review and referencing styles.
- Hypothesis: Types, formulation, and testing.

UNIT II: Research Design and Data Collection (10 Hours)

- Study designs: Descriptive, analytical, experimental, cross-sectional, case-control, cohort, RCT.
- Sampling: Population, sample size calculation, sampling methods, bias, randomization.
- Tools for data collection: Questionnaires, interviews, observations, case records.
- Ethical issues in biomedical research, informed consent, ICMR guidelines.

UNIT III: Biostatistics – Basics (5 Hours)

- Data types: Qualitative vs. quantitative, discrete vs. continuous.
- Data presentation: Tables, charts, graphs.
- Measures of central tendency (mean, median, mode).
- Measures of dispersion (range, SD, variance).

UNIT IV: Biostatistics – Applications (5 Hours)

- Probability distributions (normal, binomial, Poisson).
- Correlation and regression analysis.
- Tests of significance: t-test, chi-square test, ANOVA (concepts only).
- Use of statistical software (SPSS/R basics) in biomedical research.

Transaction Modes: Video-based teaching, Collaborative teaching, Case-based teaching, Question–Answer sessions

Suggested Readings

- *KOTHARI, C.R. Research Methodology: Methods and Techniques. New Age International.*
- *MAHAJAN, B.K. Methods in Biostatistics. Jaypee Brothers.*
- *INDIAN COUNCIL OF MEDICAL RESEARCH (ICMR). Ethical Guidelines for Biomedical Research on Human Participants.*
- *GUPTA, S.C. & KAPOOR, V.K. Fundamentals of Applied Statistics. Sultan Chand & Sons.*
- *DAWSON, B. & TRAPP, R.G. Basic & Clinical Biostatistics. McGraw Hill.*
- *THRUSFIELD, M. Veterinary Epidemiology. Blackwell Science (for reference in health-related research).*

Course Title: Advanced Anesthesia Techniques Practical	L	T	P	Cr.
Course Code: BVT507	0	0	4	2

Total Hours 60

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

1. Demonstrate proficiency in advanced airway management techniques.
2. Perform safe administration of different types of anesthesia in simulated/clinical settings.
3. Apply monitoring protocols for patients under general, regional, and local anesthesia.
4. Assist in specialized anesthesia techniques used in critical care and surgical subspecialties.
5. Adhere to safety standards, aseptic precautions, and ethical practices in anesthesia care.

Course Content

List of Practicals / Experiments (60 Hours)

- Demonstration and hands-on practice of advanced airway devices (LMA, video laryngoscope, fiberoptic bronchoscope).
- Practice of endotracheal intubation (oral and nasal) on mannequins/simulators.
- Cricothyrotomy and emergency tracheostomy techniques (simulation-based).
- Regional anesthesia techniques: spinal anesthesia, epidural anesthesia – preparation, positioning, and aseptic technique.
- Demonstration of nerve block techniques (e.g., brachial plexus, femoral, sciatic block).
- Setup and use of anesthesia workstations and vaporizers.
- Techniques of total intravenous anesthesia (TIVA) – drug preparation, infusion pumps.
- Monitoring anesthesia depth: BIS monitoring, neuromuscular monitoring.
- Patient monitoring during anesthesia: ECG, NIBP, IBP, capnography, pulse oximetry, temperature.

- Anesthesia for special cases: pediatric, geriatric, and high-risk patients (demonstration & case discussions).
- Management of anesthesia complications: laryngospasm, anaphylaxis, malignant hyperthermia (simulation drills).
- Advanced pain management techniques: patient-controlled analgesia (PCA), epidural analgesia.
- Anesthesia in critical care: sedation protocols, ventilator management basics.
- Documentation, checklists, and safety protocols in advanced anesthesia practice.

Suggested Readings

- *MILLER, R.D. Miller's Anesthesia. Elsevier.*
- *BARASH, P.G., CULLEN, B.F., & STOELTING, R.K. Clinical Anesthesia. Wolters Kluwer.*
- *MORGAN, G.E., MIKHAIL, M.S., & MURRAY, M.J. Clinical Anesthesiology. McGraw Hill.*
- *NUNES, R.R. Anesthesia Equipment: Principles and Applications. Elsevier.*
- *COUSINS, M.J. & BRENNAN, F. Cousins and Bridenbaugh's Neural Blockade in Clinical Anesthesia and Pain Medicine. Wolters Kluwer.*
- *JORDAN, S. Simulation in Anesthesia Education. Springer.*

Course Title: Specialized Surgical Procedures Practical	L	T	P	Cr.
Course Code: BVT508	0	0	4	2

Total Hours 60

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

1. Demonstrate skills in assisting and preparing for specialized surgical procedures.
2. Apply aseptic techniques, patient positioning, and instrument handling in advanced surgical setups.
3. Operate and manage specialized surgical equipment in different disciplines.
4. Recognize intraoperative complications and assist in their management.
5. Maintain surgical safety, documentation, and teamwork protocols in operating theatres.

Course Content

List of Practicals / Experiments (60 Hours)

- Orientation to specialized OT setups (neuro, cardiac, orthopedic, urology, transplant).
- Patient preparation, consent verification, and pre-operative checklist.
- Advanced scrubbing, gowning, and gloving techniques.
- Positioning of patients for specialized surgeries (neurosurgery, laparoscopic, orthopedic).
- Instrumentation for neurosurgery – drills, microscopes, and suction devices.
- Instrumentation for cardiovascular and thoracic surgery – heart-lung machine basics, vascular clamps.
- Assisting in minimally invasive/laparoscopic surgery – camera handling, trocar placement, insufflation devices.
- Use of cautery, harmonic scalpel, and advanced energy sources.
- Specialized suturing and knot-tying techniques.
- Handling of surgical implants (orthopedic plates, screws, prosthetics).

- Role in organ transplant procedures – donor/recipient preparation and transport.
- Assisting in endoscopic procedures (urology, GI surgery).
- Application of surgical drains and catheters.
- OT safety protocols for specialized surgeries (infection control, fire safety, radiation safety).
- Management of intraoperative emergencies – hemorrhage, arrhythmias, airway compromise (simulation drills).
- Documentation, specimen handling, and coordination with pathology/lab services.

Suggested Readings

- *TOWNES, W.A. Surgical Technology for the Surgical Technologist. Cengage Learning.*
- *BERRY, P. & KOHN, R. Operating Room Technique. Mosby Elsevier.*
- *GREENBERG, M.S. Handbook of Neurosurgery. Thieme.*
- *COTRAN, R.S. et al. Surgical Pathology. Saunders.*
- *LEE, J.A. & MOORE, E.E. Current Surgical Therapy. Elsevier.*
- *ZOLLINGER, R.M. Atlas of Surgical Operations. McGraw Hill.*
- *SHERMAN, J. Essentials of Perioperative Nursing. Jones & Bartlett.*

Course Title: OT Safety, Disaster & Emergency Management Practical	L	T	P	Cr.
Course Code: BVT509	0	0	4	2

Total Hours 60

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

1. Demonstrate safe practices in the operation theatre to prevent accidents and infections.
2. Apply disaster preparedness and response protocols in healthcare settings.
3. Perform basic and advanced emergency management skills relevant to the OT environment.
4. Assist in evacuation, triage, and resuscitation during emergency or disaster scenarios.
5. Adhere to national and international guidelines for OT safety and disaster management.

Course Content

List of Practicals / Experiments (60 Hours)

- Orientation to OT safety protocols: fire safety, electrical safety, and gas safety.
- Practice of infection control measures: hand hygiene, PPE, and sterilization verification.
- Spill management drills (blood, body fluids, chemical disinfectants).
- Fire extinguisher types and mock drills in OT.
- Safe handling and disposal of biomedical waste.
- Disaster preparedness plan: layout of evacuation routes and assembly points.
- Triage drills – simulation of mass casualty situations.
- Mock drills on earthquake/fire/flood preparedness in hospital setup.
- Simulation of code blue, code red, and code yellow scenarios.
- Basic life support (BLS) and cardiopulmonary resuscitation (CPR) practice.

- Advanced Cardiac Life Support (ACLS) demonstration and practice (airway, IV access, defibrillation).
- OT evacuation techniques – use of stretchers, wheelchairs, and manual lifting.
- Management of sharps injuries and exposure to infectious materials.
- Hands-on practice of oxygen cylinder handling and safe pipeline use.
- Risk assessment and reporting of near-miss incidents in OT.
- Documentation and reporting systems in emergencies and disasters.

Suggested Readings

- *WHO. Manual for Hospital Preparedness for Emergencies and Disasters. World Health Organization.*
- *AMERICAN HEART ASSOCIATION. BLS and ACLS Provider Manuals. AHA.*
- *KUNDERS, G.D. Hospitals: Facilities Planning and Management. Tata McGraw Hill.*
- *PARK, K. Textbook of Preventive and Social Medicine. Banarsidas Bhanot.*
- *LANKA, K. Hospital Safety and Infection Control. Jaypee Brothers.*
- *MOOSAVI, M. Operating Room Safety: Principles and Practice. Springer.*

Course Title: Trauma & Cardiac Life Support Practical	L	T	P	Cr.
Course Code: BVT510	0	0	4	2

Total Hours 60

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

1. Demonstrate skills in initial assessment and stabilization of trauma patients.
2. Apply primary and secondary survey techniques according to ATLS guidelines.
3. Perform Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS) in simulated and clinical scenarios.
4. Assist in the management of airway, breathing, and circulation during trauma and cardiac emergencies.
5. Coordinate with the healthcare team during emergency interventions and resuscitation.

Course Content

List of Practicals / Experiments (60 Hours)

- Trauma Life Support
  - Primary survey – Airway, Breathing, Circulation, Disability, Exposure (ABCDE).
  - Secondary survey – systematic head-to-toe assessment.
  - Airway management in trauma: chin lift, jaw thrust, oropharyngeal/nasopharyngeal airway, endotracheal intubation (simulation).
  - Practice of cervical spine immobilization and log-roll technique.
  - Hemorrhage control: pressure dressings, tourniquet application, hemostatic dressings.
  - Chest trauma management: needle decompression, chest tube insertion (demo/simulation).
  - Abdominal trauma assessment – FAST scan basics (demonstration).
  - Limb fracture stabilization – splints, traction application.
  - Shock recognition and immediate management protocols.

- Simulation drills for polytrauma and mass casualty management.

- Cardiac Life Support
  - Basic Life Support (BLS) skills: chest compressions, rescue breaths, AED use.
  - Advanced Cardiac Life Support (ACLS): airway adjuncts, bag-mask ventilation, endotracheal intubation.
  - Cardiac rhythm recognition (VF, VT, asystole, PEA).
  - Defibrillation and synchronized cardioversion techniques.
  - Administration of emergency drugs in cardiac arrest (adrenaline, amiodarone, atropine).
  - Post-cardiac arrest care – airway, oxygenation, and circulation monitoring.
  - Pediatric and neonatal life support basics (NALS/PLS overview).
  - Code blue mock drills in OT/ICU settings.

Suggested Readings

- *AMERICAN COLLEGE OF SURGEONS. Advanced Trauma Life Support (ATLS) Student Course Manual. Latest Edition.*
- *AMERICAN HEART ASSOCIATION. Basic Life Support (BLS) Provider Manual. AHA.*
- *AMERICAN HEART ASSOCIATION. Advanced Cardiovascular Life Support (ACLS) Provider Manual. AHA.*
- *JORDAN, K. & MACKWAY-JONES, K. Major Incident Medical Management and Support. Wiley-Blackwell.*
- *CAROLINE, N.L. Emergency Care in the Streets. Jones & Bartlett Learning.*
- *MILLER, R.D. Miller's Anesthesia (selected chapters on resuscitation and emergencies).*

Course Title: Research Methodology & Biostatistics Practical	L	T	P	Cr.
Course Code: BVT511	0	0	4	2

Total Hours 60

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

1. **Perform literature search and reference management using standard databases and software.**
2. **Formulate a research problem, hypothesis, and objectives for a small-scale project.**
3. **Design data collection tools such as questionnaires, proformas, and interview schedules.**
4. **Apply statistical techniques using software (SPSS/Excel/R) for data entry, analysis, and interpretation.**
5. **Prepare a mini research report with appropriate presentation of results (tables, graphs, charts).**

Course Content

List of Practicals / Experiments (60 Hours)

- Orientation to research process and ethics in biomedical research.
- Conducting a literature review using PubMed, Google Scholar, and other databases.
- Introduction to reference management tools (Mendeley/Zotero/EndNote).
- Formulating a research problem, objectives, and hypotheses (individual/group exercise).
- Designing a questionnaire and data collection form (pilot testing).
- Sampling techniques – demonstration of random sampling methods.
- Data entry and coding in MS Excel/SPSS.
- Data summarization – frequency tables, percentages, and graphical presentation.
- Calculation of measures of central tendency (mean, median, mode).

- Calculation of measures of variability (range, standard deviation, variance).
- Application of probability and normal distribution using sample datasets.
- Hands-on with chi-square test for categorical data.
- Independent t-test and paired t-test (practice with datasets).
- One-way ANOVA for comparison of multiple groups.
- Correlation and linear regression analysis.
- Interpretation of p-values and confidence intervals.
- Writing results in tables and graphs (as per scientific publication format).
- Preparation of a mini research project report and presentation by students.

Suggested Readings

- *KOTHARI, C.R. Research Methodology: Methods and Techniques. New Age International.*
- *MAHAJAN, B.K. Methods in Biostatistics. Jaypee Brothers.*
- *DAWSON, B. & TRAPP, R.G. Basic & Clinical Biostatistics. McGraw Hill.*
- *INDIAN COUNCIL OF MEDICAL RESEARCH (ICMR). Ethical Guidelines for Biomedical and Health Research.*
- *GUPTA, S.C. & KAPOOR, V.K. Fundamentals of Applied Statistics. Sultan Chand & Sons.*
- *PAGANO, M. & GAUVREAU, K. Principles of Biostatistics. Brooks/Cole.*

Semester 6th

Course Title: Internship	L	T	P	Cr
Course Code: BVT601	0	0	40	20

Total Hours 300

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

1. Assist in preparing and maintaining operation theatres, instruments, and equipment for surgical procedures.
2. Apply infection control measures, sterilization techniques, and biomedical waste management effectively.
3. Support surgeons and anesthesiologists during operations with professionalism and accuracy.
4. Demonstrate patient care skills in pre-operative, intra-operative, and post-operative settings.
5. Integrate theoretical knowledge with clinical experience to function as a competent OT technologist.

Course Contents

List of Practical's / Experiments: 300 Hours

The internship in Operation Theatre is aimed at providing students with comprehensive exposure to real-time operation theatre practices in hospitals and surgical centers. Under the guidance of surgeons, anesthesiologists, and OT technologists, students will participate in pre-operative, intra-operative, and post-operative patient care. They will assist in preparing the operation theatre, sterilizing instruments, arranging surgical trays, handling surgical equipment, and ensuring aseptic conditions throughout procedures. The internship also emphasizes infection control, biomedical waste management, anesthesia assistance, monitoring of patients during surgery, and proper documentation of procedures. Students will observe and assist in different surgical specialties such as general surgery, orthopedics, gynecology, urology, and ENT, thereby gaining multidisciplinary exposure. They will also learn teamwork, communication, and professional ethics in a high-pressure

surgical environment. Each student will maintain a logbook, prepare case reports, and submit a comprehensive internship report for final evaluation.