SUMANDEEP VIDYAPEETH

(Declared as Deemed to be University under Section 3 of the UGC Act 1956)

Accredited by NAAC with a CGPA of 3.53 out of four-point scale at 'A' Grade

Category – I deemed to be university under UGC Act - 2018

At & Post Piparia, Tal: Waghodia 391760 (Gujarat) India.

Ph: 02668-245262/64/66, Telefax: 02668-245126,

Website: www.sumandeepvidyapeethdu.edu.in

CURRICULUM

Bachelor of Science

(B.Sc)

ANESTHESIA CARE TECHNOLOGY

Attested CTC

15/2/2021

Vice-Chancellor

Sumandeep Vidyapeeth

An Institution Deemed to be University

Vill. Piparia, Taluka: Waghodia.

Dist. Vadodara-391 760. (Gujarat)

Dean

AMENDED UP TO DECEMBER -2020

INTRODUCTION

Scope

The quality of paramedical care has improved tremendously in the last few decades due to the advances in technology, thus creating fresh challenges in the field of healthcare. It is now widely recognized that health service delivery is a team effort involving both clinicians and non-clinicians, and is not the sole duty of physicians and nurses. Professionals that can competently handle sophisticated machinery and advanced protocols are now in high demand. In fact, diagnosis is now so dependent on technology, that paramedical and healthcare professionals are vital to successful treatment delivery.
Effective delivery of healthcare services depends largely on the nature of education, training and appropriate orientation towards community health of all categories of health personnel, and their capacity to function as an integrated team, with a range of skills and expertise, play key roles within the National Health Service, working autonomously, in multi-professional teams in various settings. All of them are first-contact practitioners and work across a wide range of locations and sectors within acute, primary and community care.

Learning goals and objectives for paramedical healthcare professionals

The learning goals and objectives of the undergraduate and graduate education program will be based on the performance expectations. They will be articulated as learning goals (why we teach this) and learning objectives (what the students will learn). Using the framework, students will learn to integrate their knowledge, skills and abilities in a hands-on manner in a professional healthcare setting. These learning goals are divided into nine key areas, though the degree of required involvement may differ across various levels of qualification and professional cadres: 1. Clinical care

Program outcomes

After the completion of program, student should be able to provide:

- Safe and quality patient care by incorporating technical and critical thinking and clinical reasoning in assisting the anesthesia provider with patients of all types, ages, and physical conditions for a variety of surgical and medical related procedures.
- Display current and emerging standards of care as an anesthesia technologist professional along with devoting themselves to lifelong learning.
- Attend to the various needs of diverse multicultural and complex client populations in the delivery of culturally competent care.

Ethics and accountability

Students will understand core concepts of clinical ethics and law so that they may apply these to their practice as healthcare service providers. Program objectives should enable the students to:

- Describe and apply the basic concepts of clinical ethics to actual cases and situations
- Recognize the need to make health care resources available to patients fairly, equitably and without bias, discrimination or undue influence
- Demonstrate an understanding and application of basic legal concepts to the practice

- Employ professional accountability for the initiation, maintenance and termination of patient-provider relationships
- Demonstrate respect for each patient's individual rights of autonomy, privacy, and confidentiality

Commitment to professional excellence

The student will execute professionalism to reflect in his/her thought and action a range of attributes and characteristics that include technical competence, appearance, image, confidence level, empathy, compassion, understanding, patience, manners, verbal and non-verbal communication, an anti-discriminatory and non-judgmental attitude, and appropriate physical contact to ensure safe, effective and expected delivery of healthcare. Program objectives will aim at making the students being able to

Eligibility for admission:
He/she has passed the Higher Secondary (10+2) Science or a duly constituted Board with pass marks in Physics, Chemistry, Biology

Duration of the course:
Duration of the course is 4 years including 1 year internship.

Attendance:
A candidate has to secure minimum 80% attendance in overall with at least-
1. 75% attendance in theoretical
2. 80% in Skills training (practical) for qualifying to appear for the final examination.

No relaxation, whatsoever, will be permissible to this rule under any ground including indisposition etc.

Assessment: Assessments should be completed by the academic staff, based on the compilation of the student's theoretical & clinical performance throughout the training programme. To achieve this, all assessment forms and feedback should be included and evaluated. Student must attain at least 50% marks in each Theory, Internal assessment and Practical independently / separately for each individual subject.

Attested CTC

15/2/2021

Vice-Chancellor
Sumandeep Vidyapeeth
An Institution Deemed to be University
Vill. Piparia, Taluka: Waghodia,
Dist. Vadodara-391 760. (Gujarat)

Sumandeep Vidyapeeth
Deemed to be University

Course of Instruction:

Course Name	Course Code	Theory (In hrs.) (Class and lab)	Practical (In hrs.) (Clinical)	Total (in Hours)
First Year - Total Hours 400				
Anatomy	BACT101	60	40	100
Physiology	BACT102	60	40	100
Biochemistry	BACT103	60	40	100
Pathology	BACT104	60	40	100
Total				**400**
Second Year - Total Hours 200				
Principles of Anesthesia-I	BACT201	60	40	100
General Pharmacology	BACT202	60	40	100
Third Year - Total Hours 200				
Principles of Anesthesia -II	BACT301	60	40	100
Sterilization Procedures and Bio-Medical Waste	BACT302	60	40	100

Scheme of Examination:

First Year				
SUBJECT CODE	**SUBJECTS**	**EXAMINATION PATTERN**		
		Internal	Final	TOTAL
BACT101	Anatomy	20	80	100
BACT102	Physiology	20	80	100
BACT103	Biochemistry	20	80	100
BACT104	Pathology	20	80	100
Second Year				
BACT201	Principles of Anesthesia-I	20	80	100
BACT202	General Pharmacology	20	80	100
Third Year				
BACT301	Principles of Anesthesia-II	20	80	100
BACT302	Sterilization Procedures and Bio-Medical Waste	20	80	100

Attested CTC

15/2/2021

Vice-Chancellor
Sumandeep Vidyapeeth
An Institution Deemed to be University
Vill. Piparia, Taluka: Waghodia,
Dist. Vadodara-391 760. (Gujarat)

Sumandeep Vidyapeeth • Deemed to be University •

FIRST YEAR B.SC. ANAESTHESIA CARE TECHNOLOGY

BACT101 - ANATOMY (60 HOURS)

Unit 1- Organization

- Terms, terminology, planes
- Tissues of the body (General) Epithelial tissue
- Glands, mucous membrane.

Unit 2- Skeletal system

- Cartilage
- Bones
- Ossification, blood supply
- Joints
- Synovial joint

Unit 3- Muscular tissue

- Muscle classification – I
- Muscle – II

Unit 4- Nervous system

- Neuron, Neuroglia
- Spinal cord & Spinal nerves
- Parts of brain & major functions
- Cranial nerves
- Autonomic nervous system

Unit 5- Sensory organs

- Nose & Olfaction
- Tongue

Unit 6- Circulation & Lymphatic

- Systemic, Pulmonary, Portal
- Heart, chambers, valves
- Coronary circulation, Venous drainage, applied
- Major branches of aorta, major veins, pulse
- Femoral and Axillary artery
- Diaphragm
- Lymphoid tissue classification, structure I
- Lymphoid tissue classification, structure II
- Lymphatic drainage, lymphatic trunks

Unit 7- Respiratory system

- Larynx, Trachea
- Pleura & lung & structure
- Bronchopulmonary segments, Para nasal sinuses

Unit 8 - Digestive system

- Pharynx, Esophagus
- Stomach, Duodenum
- Liver, Gall bladder, Pancreas
- Jejunum, Ileum, Appendix
- Colon, Rectum, Anal canal

Unit 9 - Urinary system)

- Kidney
- Ureter, Urinary bladder
- Prostate, Urethra

Unit 10 - Endocrine system

- Thyroid, Parathyroid
- Suprarenal
- Pituitary Pancreas**,**

Unit 11- Reproductive system

- Female reproductive system
- Male reproductive

PRACTICALS: (40 HOURS)

- Human skeleton
- Organ systems
- Organs – 1
- Organs – 2
- Organs – 3
- Organs – 4
- Organs – 5
- Types of Cartilages
- Bones -1
- Bones -2
- Bones -3
- Histology of compact bones
- Muscles of body as functional groups
- Histology of types of muscles

BACT102 - PHYSIOLOGY (60 HOURS)

Unit 1- General Physiology

- Introduction to cell physiology,
- transport across cell membrane
- Homeostasis, Body Fluid compartment & measurement

Unit 2 - Blood

- Introduction - composition and function of blood
- Plasma proteins
- Red blood cells.
- Hemoglobin
- WBC
- Platelets
- Homeostasis
- Blood Group

Unit 3 - Nerve - Muscle Physiology

- Resting membrane potential &Action potential
- Types of muscle& Mechanism of Muscle Contraction
- Neuromuscular Junction
- Neuron and neuroglia
- Properties of nerve fiber
- Secretion & Composition & function of CSF

Unit 4 - GIT

- Movement of GIT
- Deglutition & Mechanism of Vomiting
- Digestive Juices in upper digestive tract
- Digestive juices in lower digestive tract

Unit 5 - Excretory system

- Kidneys-structure, function
- Glomerular filtration rate
- Counter current mechanism of concentration of urine,
- micturition, Diuretics
- Artificial kidney, renal function tests
- Skin
- Regulation of body Temperature

Unit 6 - Respiratory system

- Mechanism of Breathing
- Hypoxia
- O2 and CO2 transport
- Pulmonary volume & Capacities

Unit 7 - Cardio Vascular System

- Introduction to CVS & general principles of circulation
- Properties of Cardiac muscle
- Cardiac cycle, heart sounds, Pulse
- Cardiac output, Heart rate ,BP ,ECG
- Coronary circulation, Cutaneous circulation-Triple response ,Shock
- Effects of exercise on CVS and Respiratory system

Unit 8 - Lymphatic System

Unit 9 - Endocrine System

- Hormones of pituitary, Thyroid
- Parathyroid Gland
- Hormones of Adrenal Gland & Pancreas

Unit 10 - Reproductive System

- Introduction to reproductive system, Puberty
- Male reproductive system,
- Female reproductive system,
- Physiological changes during pregnancy, pregnancy tests, parturition & lactation
- Male & Female contraceptive methods
- Special senses
- Vision
- Audition
- Olfaction
- Gustation

PRACTICALS: (40 HOURS)

- Introduction and Laboratory guidelines
- Demonstration of estimation of Hemoglobin
- Practical of estimation of Hemoglobin
- Practical of BT & CT
- Practical of Blood Grouping
- ESR & PCV
- Blood Pressure
- Pulse
- Revision

- Heart rate & heart sound
- Breathing rate & breathing sound
- Identification of blood cells by peripheral smear. RBC, WBC, Platelets.
- Revisions

BACT103 - BIOCHEMISTRY (60 HOURS)

- Introduction and scope of Clinical Biochemistry
- Functioning Clinical Laboratory: - Role of Medical Laboratory technologist, Code of Ethics.
- Laboratory Safety including Biomedical waste disposal
- Reagents: - Preparation, Formulation, storage, safety and uses.
- Collection and Preservation of Sample/specimen & anti-coagulants
- Chemistry of Body fluids: - Blood, CSF, Urine, Milk, Bile, Gastric Juice and Saliva.
- Buffers of Body system and pH regulation.
- Glassware's & plastic ware's used in laboratory and its calibration, cleaning, care and maintenance.
- Biophysics: -Osmosis, Dialysis, Viscosity, Surface tension, Colloids and Sedimentation, Osmotic Pressure and osmolality.
- Blood buffers and pH regulation.
- Cell biology:- Prokaryotic and Eukaryotic, cell organelles, subcellular fraction and its function.
- Chemistry and Biomedical Importance of :
- Carbohydrate
- Proteins
- Lipids
- Nucleic acid.
- Enzymes:
- Vitamins
- Minerals
- Chemistry of Body fluids: - Blood, CSF, Urine, Milk, Bile, Gastric Juice and Saliva.

PRACTICALS: (40 HOURS)

- To demonstrate glassware's, apparatus and plastic wares used in laboratory.
- Preparation of different percentage solutions
- Preparation of normal and molar solutions. (0.1 N NaOH, 0.2N HCl, 0.1 M H_2SO_4).
- Reactions of Carbohydrate
- Reactions of Protein: - Precipitation and Color reaction.
- Analysis of Normal Urine:- Physical, Chemical and Microscopic
- Analysis of abnormal Urine:- Physical, Chemical and Microscopic
- Qualitative analysis of Saliva.
- Qualitative analysis of Milk
- Qualitative analysis of Bile.
- Qualitative analysis of CSF.
- Qualitative analysis of Gastric juice.

BACT104 - PATHOLOGY (60 HOURS)

PATHOLOGY (30 HOURS)

Unit 1 - Histo Pathology

- Introduction to Histo Pathology
- Receiving of Specimen in the laboratory
- Grossing Techniques
- Mounting Techniques – various Mountants
- Maintenance of records and filing of the slides.
- Use & care of Microscope
- Various Fixatives, Mode of action, Preparation and Indication. Section Cutting
- Tissue processing for routine paraffin sections
- Decalcification of Tissues.
- Staining of tissues - H& E Staining
- Bio-Medical waste management

Unit 2 - Clinical Pathology

- Introduction to Clinical Pathology
- Collection, Transport, Preservation, and Processing of various clinical Specimens
- Urine Examination – Collection and Preservation of urine. Physical, chemical, Microscopic
- Examination
- Examination of CSF and other body fluids.
- Sputum Examination.
- Examination of feces

Unit 3 – Hematology

- Introduction to Hematology
- Normal constituents of Blood, their structure and function.
- Collection of Blood samples
- Various Anticoagulants used in Hematology
- Various instruments and glassware used in Hematology, Preparation and use of glassware
- Laboratory safety guidelines
- SI units and conventional units in Hospital Laboratory
- Hb, PCV,ESR
- Normal Hemostasis
- Bleeding Time, Clotting Time, Prothrombin Time, Activated Partial Thromboplastin Time.

Unit 4 – Blood Bank

- Introduction
- Blood grouping and Rh Types
- Cross matching

PRACTICALS: (40 HOURS)

-
- Urine Examination.
- Physical
- Chemical
- Microscopic
- Blood Grouping Rh typing.
- Hb Estimation, Packed Cell Volume[PCV], Erythrocyte Sedimentation rate{ESR]
- Bleeding Time, Clotting Time.
- Histopathology – Section cutting and H &E Staining.

SECOND YEAR B.SC. ANAESTHESIA CARE TECHNOLOGY

Each student shall undergo training in Skill Simulation Laboratory for learning certain basic clinical skills like IV/IM injection, setting IV line, Cardio-pulmonary resuscitation (CPR), and Life support skills in the beginning of second year, for duration of continuous four days. (Board of Studies letter No.:FPMS/SV/BOS-MIN/0006/2016-17, dated 19/04/2017, and vide notification of Board of Management resolution Ref.:No. SVDU/R/2017-18/5056, dated 09/01/2018).

BACT 201- Principles of Anesthesia - I (60 HOURS)

Unit 1 - Medical Gas Supply

- Compressed gas cylinders
- Color coding
- Cylinder valves; pin index.
- Gas piping system
- Recommendations for piping system
- Alarms & safety devices.

Unit 2 - Anesthesia Machine

- Hanger and yoke system
- Cylinder pressure gauge
- Pressure regulator
- Flow meter assembly
- Vaporizers - types, hazards, maintenance, filling and draining, etc.

Unit 3 - Breathing System

- General considerations: humidity & heat
- Common components - connectors, adaptors, reservoir bags.
- Capnography ETC o2
- Pulse oximetry

- Methods of humidification.
- Classification of breathing system Mapleson system - a b c d e f Jackson Rees system, Bain circuit
- Non rebreathing valves - ambu valves
- The circle system Components Soda lime, indicators

Unit 4 - Face masks & airway laryngoscopes

- Types, sizes
- Endotracheal tubes - Types, sizes.
- Cuff system
- Fixing, removing and inflating cuff, checking tube position complications.

Unit 5 - Anesthesia Ventilator and Working Principles.

Unit 6 - Monitoring

- ECG
- Sp02
- Temperature
- IBP
- CVP
- PA Pressure
- LA Pressure
- Bio Medical engineering of Trouble sorting Management, care of cleaning

Unit 7 - Basic an aesthetic techniques introduction to anesthesia

- General Anesthesia Regional Anesthesia Local Anesthesia
- Intravenous Anesthesia
- Minimum standard of anesthesia
- Who should give anesthesia?

Unit 8 - Intra-operative Management

- Confirm the identification of the patient
- Monitoring - minimum
- Noninvasive & Invasive monitoring
- Induction - drugs used
- Endotracheal intubation
- Maintenance of anesthesia
- Positioning of the patient
- Blood / fluid & electrolyte balance
- Reversal from anesthesia - drugs used
- Transferring the patient
- Recovery room – set up and things needed

Unit 9 - Post operative complications & management

- Recovery and Delayed recovery Hypoxia and Oxygen Therapy PONV

Unit 10 - Basic Life Support

- Cardio Pulmonary Resuscitation

BACT202- General Pharmacology (60 HOURS)

Unit 1- Anti-anginal agents

- Beta blockers-propranolol, atenolol, metoprolol, bisoprolol carvedilol, esmolol.
- Nitrates-nitroglycerine, isosorbide dinitrate, isosorbide mononitrate, transdermal nitrate patches
- Calcium channel blockers-nifedipine, verapamil, diltiazem, amlodipine

Unit 2 -Anti-failure agents

- Diuretics-furosemide, torsemide, thiazide diuretics, metolazone, spironolactone, combination diuretics
- Angiotensin converting enzyme (ACE) inhibitors – captopril Enalapril, ramipril, lisinopril, ACE inhibitors for diabetics and hypertensive renal disease
- Digitalis and acute inotropes – digoxin, dobutamine, dopamine, adrenaline, noradrenaline, isoprenaline

Unit 3 - Anti-hypertensive drugs

- Diuretics, beta-blockers, ACE inhibitors, calcium antagonists, direct Vasodilators, centrally acting and peripherally acting vasodilators.

Unit 4 - Anti- arrhythmic agents

- Amiodarone, adenosine, verapamil, diltiazem, lidocaine, mexiletine, Phenytoin, flecainide, beryllium, atropine

Unit 5- Antithrombotic agents

- Platelet inhibitors: aspirin, clopidogrel
- Anticoagulants: heparin, low molecular weight heparin, warfarin
- Fibrinolytics: streptokinase, urokinase
- Glycoprotein 2b3a antagonists: abciximab, tirofiban, eptifibatide
- Lipid lowering and anti-atherosclerotic drugs: statins, ezetimibe, niacin, fenofibrate

Unit 6 - Miscellaneous drugs Protamine

- **Narcotics:** morphine, pethidine, fentanyl Sedatives: diazepam, midazolam **Steroids**: hydrocortisone, prednisolone, Antihistamines: diphenhydramine
- **Antibiotics**: penicillin's, cephalosporins, aminoglycosides Antacids and proton pump inhibitors
- **Anesthetic agents**: local general

THIRD YEAR B.SC. ANAESTHESIA CARE TECHNOLOGY

BACT301- Principles of Anesthesia (60 HOURS)

Unit 1- Regional Anesthetic techniques.

- Local an aesthetic technique
- Nerve blocks
- Spinal Anesthesia
- Epidural anesthesia
- Anesthesia for specialty Surgeries

Unit 2 - Neuro Anesthesia

- Glasgow coma scale
- Premedication
- Special investigation - CT, Angiography and MRI
- Checklist
- Induction of a patient
- Reinforced Endotracheal tubes
- Postioning in neuro surgery
- I.C.P.
- Air embolism
- Reversal of the patient
- Transferring to I.C.U. / Ward

Unit 3 - Obstetric Anesthesia

- Differences between a pregnant and a normal lady
- Risks for anesthesia.
- Precautions to be taken
- Check list
- Regional vs general anesthesia
- Induction / maintenance and recovery .
- Resuscitation of the new born, APGAR score
- Reversal and extubating
- Emergencies - manual removal of placenta

Unit 4 - Pediatric Anesthesia

- Theatre setting
- Check list

Unit 5 - Fluid Calculation and administration

- Premedication - modes
- Induction
- Intubation - Securing the EIT
- Reversal & extubation – Problems
- Transferring / ICU management
- Pain management

Unit 6 - ENT Anesthesia

- Anaesthesia for adenotonsillectomy
- Anesthesia for mastoidectomy
- Bronchoscopy and esophagoscopy

Unit 7 - Cardiac Anesthesia:

- NYHA classification
- Arrhythmias
- Angina
- Dyspnoea
- Special investigations of echocardiographyangiography
- Premedication
- Setting up of monitoring system
- Monitoring - invasive and non - invasive
- Getting ready for the case
- Induction of cardiac patient, precautions to be taken
- Cardiopulmonary bypass
- Weaning of CPB
- Transferring the patient to ICU.
- Care to be taken
- I.C.U management.
- Chest tube management

Unit 8 - Day Care Anesthesia

- Special features
- Set up
- Advantages
- Disadvantages
- Complications
- Future

Unit 9 - Geriatric Anesthesia

- Physiological changes
- Diseases of aging
- Nervous system
- Geriatric pharmacodynamics / pharmacokinetics
- Postoperative nervous system dysfunction.

Unit 10 - Anesthesia For Trauma & Shock

- Resuscitation
- Pre-op investigation & assessment
- Criculatory management
- Management of anaesthesia
- Rapid sequence induction
- Other problems

Unit 11 - Thoracic Anesthesia

- Pulmonary function tests of bed side
- Vitallograph
- Preoperative preparation
- Premedication
- Check list
- Induction. Intubation
- Double lumen tubes
- monitoring
- Pain management
- Extubation
- ICU management

BACT-302 Sterilization Procedures and Bio-Medical Waste

- Waste disposal collection of used items from user area, reception protective clothing and disinfections sage guards, Bio-Medical wastes, Color cooling and management.

- Use of disinfections sorting and classification of equipment for cleaning purposes, sharps, blunt lighted etc. contaminated high risk baby care - delicate instruments or hot care instruments,

- Cleaning process - use of detergents. Mechanical cleaning apparatus, cleaning instruments, Cleaningjars,receiversbowlsetc.trays,basinsandsimilarhandwareutensils. Cleaning of catheters and tubings, cleaning glass ware, cleaning syringe sand needles.

- Materials used for wrapping and packing assembling pack contents. Types of packsprepared.Inclusionoftraysandgallipartsinpacks.Methodofwrapping and making use of indications to show that a pack of container has been through a sterilization process date stamping.

- General observations principles of sterilization. Moist heat V. Nervous System. Dry heat Sterilization. EO gas sterilization. H202 gas plasma caposterilization.

CODE OF PROFESSIONAL CONDUCT

INTRODUCTION

The Code of Professional Conduct is designed and set out as guidance for clinical practitioner within the relationship that exists with every patient receiving health care.

Essential to that relationship is the patient's trust in the practitioner. This trust hangs upon the patient's assurance of being the practitioner's first concern during their clinical encounter, and upon the patient's confidence that the care received will be competent, whether in diagnosis, therapy or counseling.

STANDARD OF PRACTICE AND CARE

Patients are entitled to the highest standard of practice and care. The essential elements of this are professional competence, good relationships with patients and colleagues and observance of professional ethical obligations.

In providing care you must therefore:

- Be willing to consult colleagues
- keep clear, accurate and contemporaneous patient records which report the relevant findings.
- keep colleagues informed.
- pay due regard to the efficacy and the prudent use of resources.
- be competent, truthful, and accurate, when reporting on investigations.
- be competent when giving or arranging treatment.

Patient's rights

- listen to patients and respect their views.
- treat patients politely and considerately.
- respect patients' privacy and dignity.
- give information to patients in a way they can understand.
- respect the right of patients to be fully involved in decisions about their care.
- respect the right of patients to refuse treatment or to take part in teaching or research, reporting the refusal to the person requesting the procedure.
- respond to complaints promptly and constructively.
- ensure that your views about a patient's life style, culture, beliefs, race, colour, sex, sexuality, age, social status, or perceived economic worth, do not prejudice the service you give.

CONFIDENTIALITY

Patients have a right to expect that you will not pass on any personal information which you learn in the course of your professional duties, unless they agree

Attested CTC

15/2/2021

Vice-Chancellor
Sumandeep Vidyapeeth
An Institution Deemed to be University
Vill. Piparia, Taluka: Waghodia.
Dist. Vadodara-391 760. (Gujarat)

Sumandeep Vidyapeeth
Deemed to be University