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
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CURRICULUM

Diploma
in
ANESTHESIA 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
Smt. B. K. Shah Med. Instt. & Resa. Centre

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.

Program outcomes

- 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.
- Positively influence health care policy decisions and participate in activities which enhance anesthesia technologists' role in improved patient care and as an advocate for patients, families, and communities.

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.

Eligibility for admission
Candidate should have passed 10 + 2 with science(PCB)

Duration of the course
Duration of the course is 2 year and 1 year internship

Medium of instruction: English shall be the medium of instruction for all the subjects of study and for examination of the course.

Attendance
A candidate has to secure minimum 80% attendance in overall with at least-
- 75% attendance in theoretical
- 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 assessment 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.

COURSE OF INSTRUCTION

Course Name	Course Code	Theory (In hrs.) (Class and lab)	Practical (In hrs.) (Clinical)	Total (in Hours)
First Year - Total Hours 500				
Introduction to Anaesthesia Technology	DAA101	60	40	100
Human Anatomy and Physiology	DAA102	60	40	100
Biochemistry	DAA103	60	40	100
Pathology	DAA104	60	40	100
Microbiology	DAA105	60	40	100
Total		**300**	**200**	**500**
2nd Year – Total Hours 400				
Peri operative Anaesthesia Management	DAA201	40	60	100
Anaesthesia for surgical subspecialties	DAA202	40	60	100
Pharmacology	DAA203	40	60	100
Clinical Anaesthesia	DAA204	40	60	100
Total		**160**	**240**	**400**
3rd Year- Internship	**Total hours-2184**			

SCHEME OF EXAMINATION

First Year				
SUBJECT CODE	**SUBJECTS**	**EXAMINATION PATTERN**		
		Internal	Final	TOTAL
DAA101	Introduction to Anaesthesia Technology	20	80	100
DAA102	Human Anatomy and Physiology	20	80	100
DAA103	Biochemistry	20	80	100
DAA104	Pathology	20	80	100
DAA105	Microbiology	20	80	100
Practical- 50, Viva- 40, Journal- 10, Total marks: 100				
Second Year				
DAA201	Peri operative Anaesthesia Management	20	80	100
DAA202	Anaesthesia for surgical subspecialties	20	80	100
DAA203	Pharmacology	20	80	100
DAA204	Clinical Anaesthesia	20	80	100
Practical- 50, Viva- 40, Journal- 10 , Total marks: 100				

Sr. No	1st Year		
	Subjects	Content	Topics covered
1.	Introduction to Anaesthesia Technology	History of Anaesthesia	• Prehistoric (Ether)era • Inhalational anaesthetic era • Regional anaesthetic era • Intravenous anaesthetic era • Modern anaesthetic era
		Gas physics	• States of matter • Temperature conversion • Humidity • Pressure measurement • Gas flows and diffusion • Gas laws • Miscellaneous concepts such a s density and specific gravity
		Medical Gas Supply	• Compressed gas Cylinders • Colour coding • Cylinders and Cylinder valves • Cylinder storage • Diameter index safety system • Medical gas pipeline system and station outlets • Air compressors • Oxygen concentrators • Alarms andsafety devices
		Gas Administration Devices	• Simple oxygen administration devices • Methods of controlling gas flow • Reducing valves • Flow meters • Regulators • Flow restrictors
		Oxygen Therapy	• Definition • Causes and responses to hypoxemia • Clinical signs of hypoxemia • Goals of oxygen therapy
		Anaesthesia Machine	• Hanger and yoke system • Cylinder pressure gauge, pin index • Pressure regulator • Flow meter assembly • Vaporizers – Types, hazards, maintenance, filling and draining.
		Breathing System	• General considerations • Classification and breathing system • Mapleson system

			• Jackson Rees system of Bain circuit • Non breathing valves – Ambuvalves
		Gas Analysers Pulse Oximeter CO_2 Monitor	• Gas analysis • Types and care • Transcutaneous oxygen monitors • Pulseoximeters • Capnographs
		Artificial Airways	• Parts of airway and features • Types, sizes and methods of insertion • Indications for use • Care of long term airways and complications • Protocol fortracheostomydecannulation • Face masks – Types, sizes and its usage.
		Minimum Standards for anaesthesia	• Who should give anaesthesia • Ten golden rules of anaesthesia • Patient assessment and preparation • Checking the drugs and equipment • Keeping the airway clear • Be ready to control ventilation • Monitor pulse and BP
2.	Human Anatomy and Physiology	Gastro-intestinal system	Parts of G IT, Oral cavity (lip, tongue (withhistology), tonsil, dentition, pharynx, salivary glands, Waldeyer's ring) Oesophagus, stomach, small and large intestine, liver, gall bladder, pancreas Radiographs of abdomen
		Circulatory System	Heart Structure and working of heart, Determination of Blood pressure, Cardiac cycle, cardiac output, heart rate Lymphatic system-Composition & Formation, organs involved, functions of lymph
		Defence mechanisms of the body	First line, second and third line of defence, active immunity, passive immunity, Factorsaffecting immunity.
		Respiratory System	Basic anatomy of the respiratory system, Process of respiration, Disorders
		Urinary System	Structure and functions of organs of urinary system, Composition of normal and abnormal urine
		Endocrine system	Definition, Classification, Mechanism of action, functions and disorders of hormones of pituitary gland, thyroid gland, parathyroid gland, adrenal

			gland and pancreas
		Nervous system	Structure of Neuron, Transmission of nerve impulse Organs of Central Nervous system & their functions Peripheral Nervous system Autonomous system Reflex action
Practical			
	a.	Haemoglobinometry White Blood Cell count Red Blood Cell count Determination of Blood Groups Leishman's staining and Differential WBC count Determination of packed cell Volume Erythrocyte sedimentation rate [ESR] Calculation of Bloodindices Determination of Clotting Time, Bleeding Time Blood pressure Recording	
3.	Biochemistry	Introduction to Laboratory apparatus	Pipettes - different types (Graduated, volumetric, Pasteur, Automatic etc.,) Calibration of glass pipettes, Burettes, Beakers, Petri dishes, depression Plates. Flasks - different types) Volumetric, round bottomed, Erlenmeyer conical etc.,) Funnels – different types (Conical, Buchner etx.) Bottles –Reagent bottles –graduated and common,Washbottles – different type Specimen bottlesetc.
		Measuring cylinders, Porcelain dish	Tubes – Test tubes, centrifuge tubes, test tube draining rack Tripod stand, Wire gauze, Bunsen burner. Corvettes, significance of corvettes in colorimeter, cuvettesfor visible andUV range, cuvetteholders Racks Bottle, Testtube,Pipette, Desiccators, Stop watch, scissors. Dispensers – reagent and sample
		Lab glass ware	Maintenance of Glass and plastic ware inlaboratory • Use of glass: significance ofboro silicate

		and apparatus	glass ; care and cleaning of glass ware, different cleaning solutions of glass • care and cleaning of plastic ware, differentcleaning solutions
		Instrumentation (Theory and demonstration)	Water bath: Use, care andmaintenance Oven &Incubators : Use, care and maintenance. Water Distilationplant and water deionisers. Use, care and maintenance Refrigerators, cold box,deepfreezers– Use, care and maintananceReflux condenser : Use, care and maintenance Centrifuges (Theory and demonstration) Diagrams to be drawn Definition, Principle, Svedberg unit, centrifugalforce, centrifugal field rpm
		Atomic structure	Dalton's theory, Properties ofelectrons, protons, neutrons,andnucleus, Rutherford's model of atomic structure, Bohr's model of atomic structure, orbit and orbital, Quantum numbers, Heisenberg's uncertainly principle. Electronic configuration –Aufbauprinciple, Pauli's Exclusion principle, etc. Valency andbonds– different types of strong and weak bonds in detail with examples.
Practical			
a	Molecular weight, equivalent weight of elements and compounds, normality molarity.Preparation of molar solutions (mole / litre solution) eg: 1 M Nacl, 0.15 M NaCL 1MNaOH,0.1MHCl,0.1MH2S04etc. Preparation of normal solutions. eg., IN Na2CO3, O IN Oxalic acid, 0.1 N HCl, 0.1N H2504, 0.66 N H2S04etc., Percent solutions. Preparation ofdifferentsolutions – v/ v w/ v (solids,liquids andacids)Conversionofapercentsolutionintoamolarsolution	
b	**Analysis of Normal Urine-** Composition of urine Procedure for routine screening Urinary screening for inborn errors of metabolism Common renal disease Urinary calculus Urine examination fordetection of abnormal constituents		
c	**InterpretationandDiagnosis throughcharts-** Liver Function tests Lipid Profile		

d	Renal Function test Cardiac markers Blood gas and Electrolytes -Estimation of Bloodsugar, Blood Urea and electrolytes. - Demonstration of Strips - Demonstration ofGlucometer		
4.	Pathology	Introduction to Histopathology	Receiving of Specimen in the laboratory Grossing Techniques Mounting Techniques – variousMountains Maintenance of records and filing of the slides. Use &care of Microscope Various Fixatives, Mode faction Preparation and Indication.
		Bio-Medical waste management	Section Cutting Tissue processing for routine paraffin sections Decalcification of Tissues. Staining of tissues - H&EStaining
		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 body fluids. Examination of cerebra spinal fluid(CSF) Sputum Examination. Examination of faeces
		Haematology	Normal constituents of Blood, their structure and function. Collection of Blood samples, Various Anticoagulants used in Haematology, Various instruments and glassware used in Haematology, Preparation and use of glassware, Laboratory safety guidelines SI units and conventional units in Hospital Laboratory Hb, PCV, ESR, Normal Haemostasis Bleeding Time, Clotting Time, Prothrombin Time, Activated Partial Thromboplastin Time.
		Blood Bank	Introduction Blood grouping and Rh Types Cross matching
Practical			
UrineExamination Blood Grouping Retyping			-Physical -Chemical -Microscopic -HbEstimation,PackedCell

			Volume[PCV], Erythrocyte Sedimentation rate[ESR] Bleeding Time, Clotting Time. Histopathology–Section cuttingandH&EStaining
5.	Microbiology	Morphology	Classification of microorganisms , size, shape an d structure of bacteria. Use of microscope in the study of bacteria.
		Growthandnutrition	Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic Bacteriology
		Sterilisationand Disinfection	Principles and use of equipment's of sterilization namely Hot Air oven, Autoclave and serum Inspissrator. Pasteurization, Anti septic and disinfectants. Antimicrobial sensitivity test.
		Immunology	Immunity Vaccines, Types of Vaccine and immunization schedule Principles and interpretation of commonly done serological tests namely Widal, VDRL, ASLO, CRP, RF &ELISA. Rapid tests forHIVand HbsAg(Technical details toavoid)
		SystematicBacteriology	Morphology, cultivation,diseasescaused,laboratorydiagnosis including specimen collection of the following bacteria(the classification, antigenic structure and pathogen cityare not to be taught) Staphyloccci, Streptococci, Pneumococci, Gonococci, Menigococci, C diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, Eschcoli,Klebsiella, Proteus,vibriocholerae, Pseudomonas &Spirochetes
		Parasitology	Morphology, life cycle, laboratory diagnosis of following parasites E. histolytica, Plasmodium, Tape worms, Intestinal nematodes
		Mycology	Morphology, diseases caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes ,opportunistic fungi.
		Virology	General properties of viruses, d iseases caused, lab diagnosis and prevention of following viruses, Herpes, Hepatitis, HIV, Rabies and Poliomyelitis.
			Practical
		Demonstration and sterilization of equipments– Hot Air oven, Autoclave, Bacterial filters. Demonstration of commonly used culture media, Nutrient broth, Nutrient agar, Blood agar, Chacolate agar, Mac conkey medium, LJ media, Robertson Cooked meat media, Potassium tellurite media with growth, Mac with LF & NLF, NA with staph Anti biotic susceptibility test Demonstration of	

		commonserologicaltests– Widal, VRDL, ELISA. Grams stain Acid Fast staining Stool exam for Helminthic ova Visit to hospital for demonstration of Biomedical waste management. Anaerobic culture methods.	
2nd Year			
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).			
1	Preoperative Anaesthesia Management	• Commonly used monitoring techniques • Echocardiography • Airway Management • Patient Positioning & potential injuries • Monitored Anaesthesia care • Ambulatory Anaesthesia • Non-operating room Anaesthesia • Anaesthesia for older patient • Epidural & Spinal Anaesthesia	
2	Anaesthesia for surgical subspecialties	• Peripheral nerve blockade • Anaesthesia for neurosurgery • Anaesthesia for thoracic surgery • Anaesthesia for vascular surgery • Obstetrical Anaesthesia • Neonatal Anaesthesia • Paediatric Anaesthesia • Anaesthesia & obesity • Endocrine function • Anaesthesia for ophthalmologic surgery • Transplant Anaesthesia	
3.	Pharmacology	Autonomic nerves system.	• Anatomy &functional organisation. • List of drugs acting an ANS including dose, route of administration, indications, contra indications and adverse effects.
		Cardiovascular drugs	• Antihypertensive • Beta Adrenergic antagonists

			• Alpha Adrenergic antagonists • Peripheral Vasodilators • Calcium channel blockers Antiarrhythmicdrugs Cardiac glycosides Sympathetic and no sympathetic inotropicagents. Coronary vasodilators. Antianginalandanti-failureagents Lipid lowering &anti atherosclerotic drugs. Drugs used in Haemostasis - anticoagulants Thrombolytic and antithrombolytics. • Cardioplegicdrugs - History, Principles and types ofcardioplagia. • Primary solutions – History, principles &types. • Drugs used in the treatment ofshock.
		Anaesthetic agents	• Definition of general and local anaesthetics. • Classification of general anaesthetics. • Pharmacokinetics and Pharmacodynamics of inhaled anaesthetic agents. • Intravenous generalanaestheticagents. • Local anaesthetics – classification mechanism of action, duration of action and methods to prolong the duration of action. Preparation, dose and routes of administration.
		Analgesics	• Definition and classification • Routes of administration, dose, frequency of administration, Side effects and management of non opioidand opiodanalgesics
		Antihistamines andantiemetics	Classification, Mechanism of action, adverse effects, Preparations, dose and routes andadministration.
		CNS stimulants and depressants	Alcohol Sedatives, hypnotics andnarcotics CNSstimulants Neuromuscular blocking agents and musclerelaxants.
		Inhalational gases and emergency drugs	
		Pharmacotherapy of respiratory disorders	• Introduction – Modulators of bronchial smooth muscle tone and pulmonary vascular smooth muscle tone • Pharmacotherapy of bronchial asthma • Pharmacotherapy ofcough

			• Mucokineticand mucolyticagents • Use of bland aerosols in respiratory care.
		Corticosteroids – Classification, mechanism of action, adverse effects and complications. Preparation, dose and routes of administration.	
		Diuretics	• Renal physiology • Side of action of diuretics • Adverse effects • Preparations, dose and routesofadministration.
		Chemotherapy of infections	• Definition • Classificationandmechanismofactionofanti microbial agents • Combination of antimicrobialagents • Chemoprophylaxis.
Practical			
	a.	• Preparation and prescription of drugs of relevance. • Experimental pharmacology directed to show the effects of commonly used drugs of relevance and interpretation offewcharts.	
4	Clinical Anaesthesia	Pre operative preparation	Pre-Anaesthetic Assessment History of present assessment Past history with emphasis on previous illness and surgery Personal history – Smoking, alcohol Physical examination– General and systemic
		Pre medications	Narcotics Antihistamines Antacids
		Investigations	Biochemistry – Blood, glucose, Urea, Creatinine Haematology – Haemogram, Prothrombin Time, Patrial thromboplastin time, BT, CT Urine - Complete urineanalysis ECG Chest X-ray ABG
		Equipment	Checking the machine, laryngoscopes, tubes, airways etc. suction apparatus, oxygen Cylinder, anaesthetic drugs and emergency drugs.
		Emergency Drugs	Atropine Epinephrine Isoprenaline Ephedrine

			Aminophylline Hydrocortisone SodaBicarb Dopamine Nor epinephrine Dobutamine
		Protection of the Patient	The eyes The ears The skin The lips, tongue, teeth Veins,arteries Peripheralnerves

CODE OF PROFESSIONAL CONDUCT

INTRODUCTION

The Code of Professional Conduct is designed and set out as guidance for the 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:

- Recognize the limits of your professional competence.
- 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

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