

NAGALAND UNIVERSITY

Regulation and Syllabus for

Bachelor of Science in Anaesthesia & Operation Theatre
Technology

(BSc. AOTT)

(3+1 years) Degree Course

2024

Regulations for the Allied Health Sciences Bachelor Programs of the Nagaland University

The Regulations & syllabus are subject to modifications by the University from time to time.

1. Eligibility for Admission:

- (i) The candidate should have passed the Higher Secondary (10+2) from CBSE or State Education Board or any Govt. recognized Board with at least 50% marks for general candidates (UR) and 45% for SC/ST/OBC/NCL candidates in Physics, Chemistry, and Biology.
- (ii) For B.Sc. (Health Information Management) course, candidates with Physics, Chemistry, and Mathematics in 10+2 may also be considered.
- (iii) The candidate should have attained the minimum age of 17 years during the admission.
- (iv) **Lateral Entry:**

Candidates who have completed a two-year diploma programme in the concerned subject from Boards recognized by Central / State Government(s) / State / Central University with at least 50% marks in aggregate for (UR) candidates and 45% marks in aggregate for SC / ST / OBC / NCL candidates shall be eligible for Lateral Entry to the second year (3rd Semester) of Bachelor Programme in Allied Health Sciences.

2. Duration of the Course:

- (i) Group A: 4 years, i.e., 3 years or 6 semesters of academic studies and one year of internship (B.Sc.HIM, B.Sc.DTT, B.Sc.AOTT, BSc RTT, BSc. MRIT).
Group B: 4 and a half years, i.e., 4 years or 8 semesters of academic studies and six months of internship (BPT, BOT courses).
Group C: 4 years, i.e., 3 and a half year or 7 Semesters of academic studies and six months of internship (BMLS) during the 8th semester.
- (ii) The maximum duration of the Bachelor Programme for Group A, B & C above shall be N+2 where N is the normal duration of the programme. No student shall be allowed to continue beyond the maximum duration.

3. Medium of Instruction:

The medium of instruction for all the Allied Health Sciences courses shall be English.

4. Working Days Per Semester:

Each Semester consists of 90 working days, with eight hours of work per day and 40 hours per week, totalling 720 hours per Semester.

5. Internship Hours:

One-year Internship programs will include 1440 hours of practical training and Six Months Internship will include 720 hours of practical training.

6. Attendance:

- (i) A candidate must secure a minimum of 80% attendance in theory classes. Students who fail to meet the requirement due to illness may be eligible for a 5% condonation, provided they submit a medical certificate from a registered medical practitioner.
- (ii) 100% in skills training (practical/internship) to qualify for the award of degree. In case of insufficient attendance, the candidate's internship period will be extended accordingly. There are no other exceptions to these rules under any circumstances.

7. Submission of Log Books:

- a. At the time of practical examination, each candidate shall submit to the examiners his / her Log book duly certified by the Head of the Department as a bonafide record of the work done by the candidate.
- b. The practical record shall be evaluated by the concerned Head of the Department (Internal Evaluator) and the practical record marks shall be submitted to the University 15 days prior to the commencement of the theory Examinations.
- c. In respect of failed candidates, the marks awarded for record at previous examination will be carried over for the subsequent examination. The candidates shall have the option to improve his performance by submission of fresh records.

8. Revaluation / Scrutiny of Answer Papers:

- (i) There is no provision for candidate to request for revaluation of the answer papers of failed candidates in any examination. However, the failed candidates can apply for scrutiny.
- (ii) Nagaland University shall constitute a Result Moderation Committee of 3 members.

9. Pattern of Question Paper for University Examination:

Descriptive type Questions	=30%
Descriptive Short Notes	=30%
Short Answer questions	=20%
MCQ Type	=20%

10. Assessment:

- (i) Assessment for theory and practical examinations: - Students must attain at least 50% marks in each theory and practical component, both in internal assessments and in the final University examinations to pass the course. The final marks will be 75% from the University examination and 25% will be from the internal assessment.
- (ii) The distribution of marks between theory and practical shall be provided in the **Curriculum and Syllabi** of each course.
- (iii) Assessment for internship: - During the internship, students gain clinical experience and learn to document patient care effectively. Each student must maintain a logbook and a portfolio.

Activity	Marks %	Assessor
Log book	20	Supervisor
Portfolio*	20	Supervisor
Practical	40	Examiners
Viva voce	20	Examiners

*The portfolio provides one with an opportunity to demonstrate the breadth and depth of your knowledge on certain topics

The portfolio incorporates the follow documents:

- Curriculum vitae
- Progress reports
- “Summary of Competency Achievement” demonstrating the level of competency achieved in each sub-module.
- Samples of work prepared by the intern from at least 5 of the modules of internship training guide.

A presentation delivered covering key aspects of the module

The clinical supervisor will examine the portfolio at regular (at least once in three months) intervals and provide feedback to the Intern.

(iv) Mode of Evaluation: -

Evaluation for Theory papers during Odd End Semester Examination shall be internally done by the colleges and Theory papers during Even End Semester Examinations shall be externally evaluated or as notified by the University.

11. Internship Project:

As part of the internship, students are required to choose a relevant subject and prepare an in-depth project report, which should include the objective, scope of the project, and a detailed report.

12. Advancement to the Next Semester:

Advancement to the next semester is contingent upon meeting the following conditions and clearing any backlogs as described: -

A student may not fail in more than two papers in the preceding semester to be eligible to advance to the next semester.

13. Repeat examination for failed candidates:

Failed papers in odd semesters can be repeated during the exams of the subsequent odd semester. Similarly, failed papers in even semesters exams can be repeated during the subsequent even semester exams.

14. Vacation:

Maximum of 15 days including Saturdays and Sundays

15. Re-Admission after Break of Study:

Students shall be allowed to continue after break in studies provided the maximum duration as given in Clause- 2 (ii) is not exceeded.

16. Award of the Degree:

- a. Candidates who have passed all written examinations and successfully completed the compulsory internship as per the university's requirements will be awarded the degree.
- b. Final Consolidated Mark sheet shall be issued by the Nagaland University to the candidate after submission of his/her Internship Completion Certificate by the College.

17. Academic Calendar:

- a. Odd semester shall be from July to December, and Even semester shall be from January to June.
- b. The odd semester and even semester university (end) examinations shall be conducted in the months of December and June respectively.

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B.Sc. Anaesthesia and Operation Theatre Technology
(BAOTT) Semester Wise Distribution of Subjects
Total Credits= 120; Total Marks=4000

SEMESTER	Code No	Subject	Credits			MARKS					Total Contact hours	
						Internal (50)		Semester (150)		Total		
			Theory	Practical	Total	Theory	Practical	Theory	Practical		Theory	Practical
1st Semester	BAOT-101	Basic Sciences I Anatomy /Physiology	4	1	5	30	20	100	50	200	72	36
	BAOT-102	Basic Sciences II	4	1	5	30	20	100	50	200	72	36
	BAOT-103	English including Terminology/ Ethics/Computer	4	1	5	30	20	100	50	200	72	36
	BAOT-104	Biostatistics/ Sociology	2	3	5	30	20	100	50	200	36	108
Total			20 credits							800	Total Contact Hours= 468	
2nd Semester	BAOT-201	Anatomy & Physiology	3+3	3+3	12	30	20	100	50	200	120	210
	BAOT-202	Pharmacology	3	2	5	30	20	100	50	200	60	72
	BAOT-203	Principles of management	2	1	3	50		150		200	36	36
Total			20 credits							600	Total Contact Hours= 534	
3rd Semester	BAOT-301	Applied Anatomy & Physiology	2	2	4	30	20	100	50	200	36	70
	BAOT-302	Clinical Pharmacology & Clinical Microbiology	3	3	6	30	20	100	50	200	54	104
	BAOT-303	Principles of Anaesthesia-I	3	7	10	30	20	100	50	200	60	250
Total			20 credits							600	Total Contact Hours= 574	
4th Semester	BAOT-401	Principles of Anaesthesia- II (Basic Anaesthetic Techniques & Regional Anaesthesia)	3	7	10	30	20	100	50	200	55	250
	BAOT-402	Medicine related to Anaesthesia-I	2	3	5	30	20	100	50	200	35	105
	BAOT-403	Medicine related to Anaesthesia-II	2	3	5	30	20	100	50	200	35	105
Total			20 credits							600	Total Contact Hours= 585	
5th Semester	BAOT-501	Basics of Surgery + Applied Microbiology (CSSD)	2	2	4	30	20	100	50	200	36	72
	BAOT-502	Anaesthesia for speciality surgeries- I	3	4	7	30	20	100	50	200	54	144
	BAOT-503	Basic ICU care -I	2	4	6	30	20	100	50	200	36	144
	BOAT-504	Research methodology	3		3	25		75		100	54	
Total			20 credits							700	Total Contact Hours= 540	
6th Semester	BAOT-601	Anaesthesia for speciality surgeries- II	2	4	6	30	20	100	50	200	36	145
	BAOT-602	Basic ICU care -II	2	4	6	30	20	100	50	200	36	145
	BAOT-603	Project & VIVA	2	3	5	30	20	100	50	200	36	108

BAOT-604	Choice based credit paper	3		3	-	-	-	-	100	54	-
Total		20 credits							700	Total Contact Hours=560	

**DETAIL SYLLABUS FOR
B.Sc. IN ANAESTHESIA AND OPERATION THEATRE TECHNOLOGY COURSE**

SEMESTER I : 20 CREDITS

Fundamentals of Pre & Para Clinical Subjects:

Subject Description:

This course is designed to provide Allied health Professionals a basic knowledge of Human Anatomy and Physiology, Biochemistry, Pharmacology, Clinical and General Pathology, Microbiology, biostatistics, sociology, computer science and medical ethics

BAOT 101: BASIC SCIENCES I

Anatomy and Physiology

INTRODUCTION TO THE CHEMISTRY OF LIFE:

- Atoms, molecules and compounds.
- Important biological molecules.
- Movements of substances within body fluids.
- Body fluids.

THE CELLS, TISSUES AND ORGANISATION OF THE BODY:

- The cell: structure and functions
- Tissues
- Organisation of the body
- The Skeleton
- Cavities of the body

THE BLOOD

- Blood cell formation and functions.
- Red blood cells.
- Blood grouping

THE CARDIOVASCULAR SYSTEM

- Heart – Position, Structure, Flow of blood through the heart
- Blood Pressure.
- Pulse.
- Circulation of blood
- Pulmonary Circulation
- Systemic or general circulation.

THE LYMPHATIC SYSTEM

- Lymph and Lymph vessels
- Lymphatic organs and Tissues

THE NERVOUS SYSTEM

- Central nervous system
- The meaning and cerebrospinal fluid (CSF)
- Brain
- Spinal Cord
- Peripheral nervous system.

THE SPECIAL SENSE

- Hearing and the ear
- Balance and the ear
- Sight and the eye
- Sense of smell
- Sense of taste

THE ENDOCRINE SYSTEM

- Pituitary gland and hypothalamus
- Thyroid gland
- Parathyroid glands
- Adrenal glands
- Pancreatic islets
- Pineal gland
- Thymus gland
- Local hormones

THE RESPIRATORY SYSTEM

- Nose and Nasal cavity
- Pharynx
- Larynx
- Trachea
- Lungs
- Bronchi and bronchioles
- Respiratory bronchioles and alveoli
- Respiration

INTRODUCTION TO NUTRITION

- The balanced diet
- Carbohydrates
- Proteins (nitrogenous foods)
- Fats
- Vitamins
- Minerals, trace elements and water
- Non- starch polysaccharide (NSP)

THE DIGESTIVE SYSTEM

- Organs of the digestive system
- Basic structure of the alimentary canal

- Mouth
- Salivary glands
- Pharynx
- Oesophagus
- Stomach
- Small intestine
- Large intestine, Rectum and Anal canal
- Pancreas
- Liver

THE URINARY SYSTEM

- Kidneys
- Ureters
- Urinary bladder
- Urethra
- Micturition

THE SKIN

- The Skin - Structure of the skin, Function of the skin, Wound healing.

RESISTANCE AND IMMUNITY

- Non-specific defense mechanism
- Immunity

THE MUSCULOSKELETAL SYSTEM

- Bone
- Axial skeleton
- Appendicular skeleton
- Joints
- Main synovial joints of the limbs
- Muscle tissue
- Principal skeletal muscle

INTRODUCTION TO GENETICS

- Chromosomes, genes and DNA
- Protein synthesis
- Cell division
- The genetic basis of inheritance

THE REPRODUCTIVE SYSTEMS

- Female reproductive system
- External genitalia (vulva)
- Internal genitalia
- Breasts
- The male reproductive system.

Suggested reading: Text Book of Medical Physiology" by Guyton and Hall, 13th edition
(Publisher, Elsevier)

BAOT 102: BASIC SCIENCES II

a) Biochemistry:

Basics of carbohydrates, Amino acids, Protein and Non-protein, Lipids, Enzymes, Minerals- Iron, Calcium & Magnesium, Normal value ranges

b) Pharmacology:

- General definitions- Pharmacology, Drugs, Medical pharmacology, Toxicology, Pharmacodynamic properties, Pharmacokinetic properties
- Introduction to pharmacology, Basic pharmacology terminology and concepts
- Introduction to pharmacodynamics
- Introduction to pharmacokinetics- absorption, distribution, elimination
- Mechanism of drug action, dosage forms, routes of administration
- Common generic and trade names
- Medication errors, Legal aspects in pharmacology

c) Pathology

Introduction of pathology, basics of inflammation, infection, degeneration and tumors (Neoplasm) clinical pathology- Study of body Fluids- CSF, Urine & stool and their variations in common diseases

d) Microbiology

Introduction and historical background of Microbiology, classification special characteristics of organisms, cultivation (Different types of Media) and identification of organisms Sterilization techniques; Basics of Immunology- Ag Ab reaction & Basics in Immune response & Hypersensitivity.

References:

1. Textbook of Biochemistry for Medical Students 6th Edition, DM Vasudevan , Sreekumari S , Kannan Vaidyanathan.
2. 1. R. S. Satoskar, S.D. Bhandarkar, S. S. Ainapure, Pharmacology and Pharmacotherapeutics, 18th Edition, single Volume, M/S Popular Prakashan, Bombay – 400 034.
3. 2. K.D. Tripathi, Essentials of Medical Pharmacology, V. Edition, M/s. Jaypee Brothers
4. Textbook of Microbiology 9th Edition, Ananthanarayan , Paniker.

BAOT 103: ENGLISH INCLUDING TERMINOLOGY/ ETHICS/COMPUTER

a) English Communication Skill

Course Objective

To develop the potential for language use to perform communicative functions, meeting the demands in the student's academic and professional set-ups

The subject covers the aspects of oral communication, Grammar, Reading and Writing.

Subject description:

Phonetics/ Vocabulary& Reading:

Oral Work:/ Grammar / Reading/ Writing:

Reference: Manipal Academy of higher education; English book for Nurse by Selva Rose, 3rd Edition.

b) Medical Terminology- (Including fundamentals of clinical science)

Subject Description: Orientation to medical terminology, terms related to sympathetology, causation investigations and treatment of condition within medicine, surgery, Obstetrics and Gynecology, all specialties including terms related to biological disorders (skin and breast, Musculo-skeletal, Neurological and Psychiatric, Cerebro & Cardiovascular disorders, and Common diseases affecting each of the above system).

Reference: Hand book of Medical Terminology- IR Asher
Medical diagnostic & procedural Terminology- Asher
Medical Dictionary-Oxford &IBH

c) Medical Ethics

- Medical ethics - Definition - Goal - Scope
- Code of conduct - Introduction
- Basic principles of medical ethics – Confidentiality
- Malpractice and negligence - Rational and irrational drug therapy
- Autonomy and informed consent - Right of patients
- Care of the terminally ill- Euthanasia
- Organ transplantation
- Medico legal aspects of medical records – Medico legal case and type- Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication – Release of medical information - Unauthorized disclosure - retention of medical records - other various aspects

Reference: Principles of Bio-Ethics: Tom Beauchamp & Childress.

d) Basics of Computers

Course Content:

Introduction to computer – I/O devices – memories – RAM and ROM – Different kinds of ROM

Networking – LAN, WAN, MAN (only basic ideas)

MS word, MS-Excel, MS-POWERPOINT,

Explorer and Navigator – Uploading and Download of files and images – E-mail ID creation –Sending messages – Attaching files in E-mail – Introduction to “C” language – Practical

Creating a worksheet using MS-Excel with data and sue of functions

Using MS-Excel prepare a worksheet with text, date time and data

Preparing a chart and pie diagrams using MS-Excel

Using Internet for searching, uploading files, downloading files creating e-mail ID

Using C language writing programs using functions

Computer application of statistical data

Reference: 1. Computer Fundamentals: Pearl Software
2. Fundamentals of Computers: E. Balagurusamy

BAOT 104: BIOSTATISTICS/SOCIOLOGY

a) Biostatistics

General Statistics

- Definition and importance of biostatistics
- Types of data, rates and ratio
- Methods of collection of data-primary and secondary data
- Sampling of data
- Measures of central tendency (Mean, median, mode)
- Measures of Dispersion (Mean deviation, standard deviation, Range)
- Presentation of data (Bar diagram, Pie diagram, Histogram, Frequency, Polygon, Frequency curve, Cumulative frequency curve, Line diagram)
- Correlation and Regression analysis
- Basic concept of probability

Reference: Introduction to Biostatistics and Research Methods (5th Edition)– P.S.S. Sundar Rao & J. Richard.

b) Sociology and Environment Health: Practical including field work

Sociology and health

- Difference between community health and clinical medicine
- Concepts in sociology which influence health and disease.
- Social structure, social behaviour , social institutions, socialization, culture, custom, acculturation. standard of living, social problems, social stress and social surveys
- Types of family, functions of family, family and health, broken family.
- Demography and health.
- Influence of social factors on health.

References – Text book of preventive Medicine by Park and Park Chapters 12 and 13.

Environment health: The influence of environment on health and preventive measures.

- Water, air , soil , housing, waste, radiation
- Water - Sources of water, quality of water, water pollution, purification of water , disinfection.
- Air –air pollutants , sources of air pollution , effects of air pollution.
- Housing – types and influence on health
- Waste disposal - excreta disposal, hospital waste disposal impact on health
- Radiation exposure and effect on health

References – Text book of preventive Medicine by Park and Park Chapters 12 and 13.

SEMESTER II : 20 CREDITS

Main Syllabus

1. Basic Sciences Contd.- Anatomy & Physiology
2. Pharmacology- I
2. Principles of Management

BOAT 201: ANATOMY & PHYSIOLOGY

Anatomy

Cardiovascular System: Heart-size, location, chambers, cardiac valves, Blood supply of heart Systemic & pulmonary circulation, Branches of aorta, common carotid artery, subclavian artery, axillary artery, brachial artery, femoral artery

Excretory system – Kidneys, ureters, bladder

Nervous System- Neuron, Classification of Nervous System, Cerebrum, cerebellum, midbrain, pons, medulla oblongata, spinal cord with spinal nerve, Meninges, Ventricles & cerebrospinal fluid, Blood supply of brain, Cranial nerves, Sympathetic trunk & names of parasympathetic ganglia

Autonomic Nervous System- Sympathetic and parasympathetic distribution and functions and comparison of functions.

Reference Books:

1. Ross and Wilson Anatomy and Physiology in Health and Illness
2. Chaurasia –A Text book of Anatomy, T.S. Ranganathan – A text book of Human Anatomy

Physiology

1. Cardio-Vascular System:

- (i) Physiology of the heart
- (ii) Heart sounds
- (iii) Cardiac cycle, Cardiac output.
- (iv) Auscultatory areas.
- (v) Arterial pulse, blood pressure
- (vi) Hypertension

2. Excretory system:

- (i) Function of kidneys
- (ii) Renal circulation
- (ii) Mechanism of urine formation
- (iii) Renal function tests, renal disorders

3. Central Nervous system:

- (i) Functions of NS
- (ii) Cerebro Spinal Fluid(CSF) : formation, circulation, properties, composition and functions, lumbar puncture.
- (iii) Autonomic Nervous System: Sympathetic and parasympathetic distribution and functions and comparison of functions.

Practical:

Measurement of pulse and blood pressure
Auscultation of heart sounds

Reference Books:

1. Guyton (Arthur) Text Book of Physiology. Latest Ed. Prism publishers
2. Choudhari (Sujith K) Concise Medical Physiology Latest Ed. New Central Book
3. Ganong (William F) Review of Medical Physiology. Latest Ed . Appleton.

BAOT 202: PHARMACOLOGY

Introduction to pharmacology

General concepts about pharmacodynamic and Pharmacokinetic

Principles involved in drug activity.

I. Autonomic nerves system.

- Anatomy & functional organisation
- List of drugs acting on ANS including dose, route of administration, indications, contra indications and adverse effects.

II. Cardiovascular drugs- Enumerate the mode of action, side effects and therapeutic uses of the following drugs.

- a. Antihypertensives
- b. Antiarrhythmic drugs
- c. Cardiac glycosides
- d. Sympathetic and nonsympathetic inotropic agents.
- e. Coronary vasodilators.
- f. Antianginal and anti failure agents
- g. Drugs used in Haemostasis – anticoagulants Thrombolytics and antithrombolytics.

III. Anaesthetic agents.

- Definition of general and local anaesthetics.
- Classification of general and local anaesthetics.

IV Analgesics

- Definition and classification
- Routes of administration, dose, frequency of administration, Side effects and management of non opioid and opioid analgesics

V. Antihistamines and antiemetics-

- Classification, Mechanism of action, adverse effects

VI. CNS stimulants and depressants

- Sedatives, hypnotics and narcotics
- CNS stimulants
- Neuromuscular blocking agents and muscle relaxants.

VII. Antibiotics

- Classification, spectrum of activity, dose, routes of administration and adverse effects of penicillin, cephalosporins, aminoglycosides, tetracyclines, chloramphenicol, antitubercular drugs.

Reference Books:

1. R. S. Satoskar, S.D. Bhandarkar, S. S. Ainapure, Pharmacology and Pharmacotherapeutics, 18th Edition, single Volume, M/S Popular Prakashan, 350, Madan Mohan Marg, Tardeo, Bombay – 400 034.
2. K.D. Tripathi, Essentials of Medical Pharmacology, V. Edition, M/s. Jaypee Brothers
3. Laurence and Bennet, Clinical Pharmacology, ELBS Edition, 9th Edition.

BOAT 203: PRINCIPLE OF MANAGEMENT**(a): Principle of management**

Development of management: Definitions of management.

Functions of management: Planning – organizing – directing – controlling

Planning: Types of planning – short term and long plans – corporate or strategic communication

Types of communication – Barriers of effective communication – Techniques for improved communication

Directing: Principles relating to direction process – principles and theories of leadership – leadership styles – delegation of authority

Co-ordination: Co-ordination and co-operation – principles of co-ordination – techniques of coordination charts and records – standard procedure instructions

(b): personnel and financial management

Objective of personnel management – Role of personnel manager in an organization – staffing and work distribution techniques – job analysis and description – recruitment and selection processes – orientation and training – coaching and counselling – disciplining – complaints and grievances- termination of employees – performance appraisal – health and safety of employees – consumer Protection act as applicable to health care services insurance – health schemes – reimbursement.

SEMESTER III :20 CREDITS**Main Syllabus**

1. Applied Anatomy and Physiology
2. Clinical Pharmacology
3. Clinical Microbiology
4. Principles of Anaesthesia

BOAT 301: APPLIED ANATOMY AND PHYSIOLOGY RELATED TO ANAESTHESIA**I. Respiratory system****a) Structure and function of the respiratory tract in relation to respiratory system**

Nose - Role in humidification

Pharynx - Obstruction in airways

Larynx - Movement of vocal cords, Cord palsies.

Trachea & Bronchial tree - vessels, nerve supply, respiratory tract, reflexes, bronchospasm

Alveoli - Layers, Surfactants

b) Respiratory Physiology

- Control of breathing

- Respiratory muscles - diaphragm, intercostals
 - Lung volumes - dead space, vital capacity, FRC etc.
 - Pleural cavity - intrapleural pressure, pneumothorax.
 - Work of breathing - airway resistance, compliance
 - Respiratory movements under anaesthesia.
 - Tracheal tug - signs, hiccup
- c) Pulmonary Gas Exchange and Acid Base Status
- Pulmonary circulation
 - Pulmonary oedema,
 - Pulmonary hypertension
 - Pulmonary function tests.
 - Transfer of gases - oxygen & Carbondioxide
 - Acid base status, definitions, acidosis types, Alkalosis types, buffers in the body.
- d). Oxygen: properties, storage, supply, hypoxia
- e). Respiratory failure, type, clinical features, causes.

II. Cardiovascular system

Anatomy - Chambers of the heart, major vasculature.

Coronary supply, innervation.

Conduction system.

Cardiac output - determinants, heart rate, preload, after load.

Coronary blood flow & myocardial oxygen supply

ECG

Arrhythmias

Cardiovascular response to

Anaesthetic & surgical procedures.

SHOCK – (Shock) types, definition, causes, effects, management.

Cardio pulmonary resuscitation – Basic life support of advanced life support

III. Fluids and electrolytes

- Body Fluids - Composition
 - Water, sodium and potassium balance
 - I.V. Fluids and plasma Expanders - composition & administration
- Peri-operative fluid administration
- I.V. Cannulation, Drip infusion sets.
- *Fluid Calculation and administration-Adult & Paediatric

IV. Blood transfusion

Blood grouping, storage, administration various Blood Products

V. Nervous system

- (i) Spinal cord and Nerve Plexus anatomy - Cervical plexus- Brachial Plexus- Lumbar plexus
- (ii) Cerebral circulation: Circle of willis, Blood supply of spinal cord
- (iii) Cerebrospinal fluid (CSF): formation, circulation, properties, composition and functions. Intracranial pressure, Lumbar puncture.
- (iv) Autonomic Nervous System: Sympathetic and parasympathetic distribution and functions and comparison of functions
- (v) Pain Pathways

Reference Books:

1. Ross and Wilson Anatomy and Physiology in Health and Illness
2. Chaurasia –A Text book of Anatomy, T.S. Ranganathan – A text book of Human Anatomy
3. Guyton (Arthur) Text Book of Physiology. Latest Ed. Prism publishers
4. Choudhari (Sujith K) Concise Medical Physiology Latest Ed. New Central Book
5. Ganong (William F) Review of Medical Physiology. Latest Ed . Appleton.

BAOT 302 : CLINICAL PHARMACOLOGY AND CLINICAL MICROBIOLOGY

Clinical pharmacology

ANTISIALAGOGUES: Atropine, Glycopyrrolate

SEDATIVES AND ANXIOLYTICS: Diazepam, Midazolam, Phenergan, Lorazepam, Chlorpromazine, Trichlophos

NARCOTICS: Morphine, Pethidine, Fentanyl, Pentazocine

ANTIEMETICS: Metoclopramide, Ondansetron, Dexamethasone

ANTACIDS: Sodium citrate, Gelusil, Mucaine gel.

H2 BLOCKERS: Cimetidine, Ranitidine, Famotidine

INDUCTION AGENT: Thiopentone , Diazepam, Midazolam, Ketamine, Propofol, Etomidate.

MUSCLE RELAXANTS: Depolarising - Suxamethonium, Non depolarising -Pancuronium, Vecuronium, Atracurium, Rocuranium

INHALATIONAL GASES: Gases - O₂, N₂O, Air Agents – Ether, Halothane, Isoflurane, Sevoflurane, Desflurane

REVERSAL AGENTS: Neostigmine, Glycopyrrolate, Atropine, Nalorphine, Naloxone, Flumazenil (Diazepam)

LOCAL ANAESTHETICS: Xylocaine, Preparation, Local – Bupivacaine - Topical, Prilocaine-jelly, Emla - Ointment, Etidocaine, Ropivacaine

EMERGENCY DRUGS:

- Adrenaline : Mode or administration, dilution, dosage, Effects
- Atropine, bicarbonate, calcium, ephedrine, xylocard, Isoprenaline
- Ionotropes : dopamine, dobutamine, amiodarone
- Aminophylline, hydrocortisone, antihistaminics, potassium.
- Cardiovascular drugs
- Antihypertensives
- Antiarrhythmics
- Beta - Blockers

- Ca - Channel blockers.
- Vasodilators – nitroglycerin & sodium nitroprusside
- Respiratory system - Bronchodilators, respiratory stimulants
Broncholytic agents
- Renal system - Diuretics, furosemide, mannitol
- Obstetrics - oxytocin, methergin
- Miscellaneous – Antibiotics, NSAIDs, Anticoagulants, Insulin

Reference Books:

1. R. S. Satoskar, S.D. Bhandarkar, S. S. Ainapure, Pharmacology and Pharmacotherapeutics, 18th Edition, single Volume, M/S Popular Prakashan, 350, Madan Mohan Marg, Tardeo, Bombay – 400 034.
2. K.D. Tripathi, Essentials of Medical Pharmacology, V. Edition, M/s. Jaypee Brothers
3. Laurence and Bennet, Clinical Pharmacology, ELBS Edition, 9th Edition.

Clinical microbiology

- Sterilization & decontamination
 - Dry Heat
 - Moist Heat
 - Chemical methods
 - Gaseous methods
 - Filtration
- Wound Infection & Urinary Tract Infections
- Blood stream Infections
- Respiratory tract Infection
- S.Typhi, Salmonella Paratyphi 'A', Salmonella typhimurium
- Catheter, IV associated Infections
- Hospital acquired infections & prevention of hospital acquired infections
- Hepatitis C, HBV, HIV
- * Hyper sensitivity reaction – Type I, II, III, IV

Reference Books:

- Textbook of Microbiology 9th Edition, Ananthanarayan , Paniker
 Textbook of Microbiology 4th Edition, C. P. Baveja
 Mackie and McCartney Practical Medical Microbiology 14th Edition (REFERENCE)

BAOT 303 : PRINCIPLES OF ANAESTHESIA

1. Medical gas supply

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

2. Anaesthesia machine

- Hanger and yoke system
- Cylinder pressure gauge
- Pressure regulator

- Flow meter assembly
- Vapourizers - types, hazards, maintenance, filling and draining, etc.

3. Breathing system

- General considerations: humidity & heat
- Common components - connectors, adaptors, reservoir bags.
- Methods of humidification.
- Classification of breathing system Mapleson system, Jackson Rees system, Bain circuit
- Non rebreathing valves - ambu valves
- The circle system Components Soda lime, indicators

4. Gas analysers, pulse oximeter, Co2 monitor

- Gas analysis
- Types and care
- Transcutaneous oxygen monitors
- Pulse oximeters
- Capnographs

5. Oxygen therapy

- Definition
- Causes and responses to hypoxemia
- Clinical signs of hypoxemia
- Goals of oxygen therapy
- Evaluation of patients receiving oxygen therapy
- Hazards of oxygen therapy

6. Face masks & airway equipment

- Face masks- Types, sizes
- Laryngoscopes, Endotracheal tubes - Types, sizes.
- Cuff system
- Fixing, removing and inflating cuff, checking tube position complications.
- Bougie
- LMA

7. Methods of cleaning and sterilization of anaesthetic equipment

8. Anaesthesia ventilator and working principles

9. Monitoring

- ECG
- SPO2
- Temperature
- IBP
- CVP
- ETCO2

Bio Medical engineering of Trouble sorting Management, care of cleaning

10. History of Anaesthesia

- Prehistoric (Ether) era
- Inhalational anaesthetic era
- Regional anaesthetic era
- Intravenous anaesthetic era
- Modern anaesthetic era

Reference Books:

1. Anaesthesia Equipments by A.K. Paul
2. Understanding Anaesthesia Equipment, by Jerry A. Dorsch
3. Basics of Anaesthesia, 6th edition, by Ronald D. Miller
4. Anaesthesia Technicians and Technologist manual- by Glenn Woodworth, Jeffrey R. Kirsch, Shannon Sayers-Rana
5. Manual of Anesthesia for Operation Theatre Technicians by Pillai Ahanatha

SEMESTER IV: 20 CREDITS**Main Syllabus**

1. Basic Anaesthetic Techniques
2. Medicine related to Anaesthesia - 1
3. Medicine related to Anaesthesia - 11

BAOT 401 : PRINCIPLES OF ANAESTHESIA–II (BASIC ANAESTHETIC TECHNIQUES & REGIONAL ANAESTHESIA)**Basic Anaesthetic techniques**

- Introduction to Anaesthesia
- General Anaesthesia
- * Regional Anaesthesia
- * Local Anaesthesia
- * Intravenous Anaesthesia
- Minimum standard of anaesthesia
- Who should give anaesthesia?

Pre-op preparation

Pre anaesthetic assessment~ History – past history - disease / surgery / and personal history - smoking / alcohol

General physical assessment, systemic examination – CVS, RS, CNS

Investigations

Routine - Haematological - their significance

- Urine
- E.C.G.
- Chest X – ray

Special -Endocrine, hormonal assays

- Echocardiography
- Angiography
- Liver function test
- Renal function test
- Others

Case acceptance: ASA grading - I, II, III, IV. V

Pre - anaesthetic orders:

- Patient - Informed consent
- NPO guidelines
- Premedication - advantages, drugs used
- Special instructions - if any

Machine - Checking the machine, O₂, N₂O, suction apparatus
Laryngoscopes, Endotracheal tubes, LMA, Oral airways

- Things for IV accessibility
- Monitoring systems- ECG, SpO₂, EtCO₂, NIBP, Temp
- Drugs - Emergency drugs
- Anaesthetic drugs

Intraoperative management

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

Post operative complications & management

- Delayed recovery
- Hypoxia and Oxygen Therapy
- PONV
- Shivering

Regional Anaesthesia

Regional Anaesthetic techniques

- a. Local anaesthetic technique
- b. Nerve blocks
- c. Spinal Anaesthesia
- d. Epidural anaesthesia

Reference Books:

1. Basics of Anaesthesia, 6th edition, by Ronald D. Miller
2. Anaesthesia Technicians and Technologist manual- by Glenn Woodworth, Jeffrey R. Kirsch, Shannon Sayers-Rana
3. MANUAL OF ANESTHESIA FOR OPERATION THEATER TECHNICIANS by PILLAI AHANATHA

BAOT 402: MEDICINE RELATED TO ANAESTHESIA I

1. Disorder of haemopoiesis - Anaemia - iron deficiency anaemia,
2. Diseases of CVS – Congenital heart disease, Valvular Heart Disease, Hypertension, CAD, Heart Failure, Peripheral vascular diseases.
3. Respiratory diseases – Asthma, COPD, Pneumonia
4. Liver and biliary tract diseases - Viral hepatitis, alcoholism, CLD

BAOT 403: MEDICINE RELATED TO ANAESTHESIA II

1. Pregnancy associated diseases
2. Paediatric patient- infant/ neonate, Paediatric diseases
3. Infectious diseases - Sepsis and septic shock, infective endocarditis, Tetanus, Necrotizing soft-tissue infection, infection control in hospital, diseases caused by bacteria, viruses, mycobacterium, viruses, fungi, protozoa and helminthes, HIV & AIDS
4. Kidney & Urinary tract - ARF, CRF, Glomerulonephritis, Haemodialysis, Transplant, Urinary tract infection
5. Endocrine Diseases - Diabetes mellitus, Thyroid diseases, Pheochromocytoma

Reference Books:

1. Stoelting's Anaesthesia and coexisting diseases 2nd South-Asian Edition (Reference)
2. Basics of Anaesthesia, 6th edition, by Ronald D. Miller
3. Anaesthesia Technicians and Technologist manual- by Glenn Woodworth, Jeffrey R. Kirsch, Shannon Sayers-Rana

SEMESTER V: 20 CREDITS

Main Syllabus

1. Basics of Surgery and CSSD
2. Anaesthesia for speciality surgeries- I
3. Basic ICU care –I

BAOT 501 : BASICS OF SURGERY + APPLIED MICROBIOLOGY (CSSD)

Basics of surgery

1. Surgical Team work.
2. Surgical terminology, types of incision and indications for the use of particular incision;
3. Haemorrhage-signs and symptoms of internal and external; classification and management;
4. Identification of types of tourniquets reasons for use and duration of application, dangers of use;
5. Wounds, types, process of healing, treatment and complications; process of wound healing, personal cleanliness and aseptic techniques; universal precautions, hand washing principles
6. Pre-operative and post-operative care of the surgical patient;
7. Emergency procedures; e.g: Tracheotomy, ICD insertion.
8. Knowledge of surgical asepsis, skin preparation for invasive procedures

CSSD Procedures

1. Waste disposal collection of used items from user area, reception protective clothing and disinfections sage guards, Bio-medical wastes, Colour coding and management
2. Use of disinfections, sorting and classification of equipment for cleaning purposes, sharps, blunt etc. contaminated high risk baby care - delicate instruments or hot care instruments,
3. Cleaning process - use of detergents. Mechanical cleaning apparatus, cleaning instruments, Cleaning jars, receivers bowls etc. trays, basins and similar hand ware utensils. Cleaning of catheters and tubing, cleaning glass ware, cleaning syringes and needles.
4. Materials used for wrapping and packing assembling pack contents. Types of packs prepared. Inclusion of trays and galliparts in packs. Method of wrapping and making use of indications to show that a pack of container has been through a sterilization process date stamping.
5. General observations principles of sterilization. Moist heat, Dry heat sterilization. ETO gas sterilization. H₂O₂ gas plasma capto sterilization.

Reference Books:

1. MANUAL OF ANESTHESIA FOR OPERATION THEATER TECHNICIANS by PILLAI AHANATHA
2. Anaesthesia Technicians and Technologist manual- by Glenn Woodworth, Jeffrey R. Kirsch, Shannon Sayers-Rana

BAOT 502: ANAESTHESIA FOR SPECIALITY SURGERIES- I

Obstetric anaesthesia

- Differences between a pregnant and a normal lady
- Risks for anaesthesia.
- Precautions to be taken
- Check list
- Regional vs general anaesthesia
- Anaesthesia for LSCS
- Epidural analgesia
- Special situations: pre -eclampsia
- Induction / maintenance and recovery
- Resuscitation of the new born, APGAR score
- Reversal and extubation
- Emergencies
 - manual removal of placenta
 - A.P.H.
 - P.P.H.
 - Ruptures uterus
 - Ectopic Pregnancy

Paediatric Anaesthesia

- Theatre setting
- Check list
- * Fluid Calculation and administration
- Premedication - modes

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

ENT Anaesthesia

- Anaesthesia for adenotonsillectomy
- Anaesthesia for mastoidectomy
- Bronchoscopy and oesophagoscopy

Day care Anaesthesia

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

Geriatric Anaesthesia

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

Post-operative problems

Nausea & Vomiting

Sore throat

Laryngeal edema, Bronchospasm

Neurological complications.

Awareness

Vascular complications.

Trauma to teeth

Headache

Backache

Ocular complications

Auditory complication

Reference Books:

1. Basics of Anaesthesia, 6th edition, by Ronald D. Miller
2. Miller's Anaesthesia 7th Edition (Reference Book)
2. Anaesthesia Technicians and Technologist manual- by Glenn Woodworth, Jeffrey R. Kirsch, Shannon Sayers-Rana
3. MANUAL OF ANESTHESIA FOR OPERATION THEATER TECHNICIANS by PILLAI AHANATHA

BAOT 503: BASIC INTENSIVE CARE UNIT I

1. Monitoring and diagnostic procedures in I.C.U.

- Central Venous access.
- ECG monitoring.
- Invasive hemodynamic monitoring

2. General care of patient in I.C.U.

- Eye
- Bladder and Skin
- Care of mechanically ventilated patient
- Tracheotomy, humidification
- Vascular lines - arterial, venous line
- Radiography
- Physiotherapy - chest physiotherapy

3. Fluid balance and parenteral nutrition

4. Infectious diseases in I.C.U.

Antibiotics in I.C.U

5. Oxygen therapy

Reference Books:

1. Morgan and Mikhail's Clinical Anaesthesia
2. Miller's Anaesthesia 7th Edition (Reference Book)
3. Anaesthesia Technicians and Technologist manual- by Glenn Woodworth, Jeffrey R. Kirsch, Shannon Sayers-Rana

BAOT 503: RESEARCH METHODOLOGY

- Research in medicine and healthcare
- Clinical research and clinical trials
- Research models
- Research process
- Selecting an instrument
- Gathering data
- Analyzing the data
- Presenting results
- Publishing research
- Search techniques
- Research's relationship with the professional body of knowledge

SEMESTER VI: 20 CREDITS

Main Syllabus

1. Anaesthesia for speciality surgeries- II
2. Basic ICU care –II
3. Project work
4. Choice based credit paper

BAOT 601: ANAESTHESIA FOR SURGICAL SPECIALITIES- II

Neuro Anaesthesia

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

Cardiac Anaesthesia :

- NYHA classification
- Arrhythmias
- Angina
- Dyspnoea
- Special investigations
- Echocardiography
- angiography
- 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

Anaesthesia outside the O.R.

- Situations
- Cath Lab
- Radiology
- E.C.T.
- Short comings

Anaesthesia for trauma & shock

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

Thoracic Anaesthesia

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

Major catastrophes

- Mortality
- Causes of death
- Cerebral damage
- Prevention

Reference Books:

1. Morgan and Mikhail's Clinical Anaesthesia
2. Miller's Anaesthesia 7th Edition (Reference Book)
3. Anaesthesia Technicians and Technologist manual- by Glenn Woodworth, Jeffrey R. Kirsch, Shannon Sayers-Rana

BAOT 602: BASIC ICU CARE-II

1. Acid - Base disorders

2. Mechanical ventilation

3. Cardiovascular failure

- Inotropic support
- Vasodilator drugs

4. Renal failure & liver failure

5. Head injury

6. Principles of transfusion therapy

- Whole blood, erythrocyte products
- Blood components
- Platelets concentrate
- Massive transfusion, acute transfusion reactions.

BAOT 603: PROJECT PREPARATION AND VIVA

BAOT 604: CHOICE BASED CREDIT PAPER

Option 1. Principles of basic nursing & Hospital infection control

Option 2. Disaster management & human resource management

Option 3. Social psychology & counseling

Syllabus for Option 1. (Principles of basic nursing & hospital infection control)

Admission to the hospital.

- Unit and its preparation admission bed.
- Admission procedure.
- Medico-legal issues.
- Roles and Responsibilities of the nurse.

Discharge from the hospital

- Types: Planned discharge, LAMA and abscond,
- Referrals and transfers.
- Medico-legal issue.
- Roles and Responsibilities of the nurse.
- Care of the Unit after discharge.

Communication:

- Levels, Elements, Types, Modes, Process, Factors influencing Communication.
- Methods of Effective Communication.
- Helping Relationships (NPR) : Dimensions of Helping Relationships, Phases of a helping relationship
- Communication effectively with patient, families and team members and maintain effective human relations with special reference to communicating with vulnerable group.
- Patient Teaching: Importance, Purpose, Process, role of nurse and Integrating teaching in Nursing Process.

Vital Signs

- Guidelines for taking vital signs
- Body temperature
- Pulse:
- Respiration
- Blood Pressure:
- Recording of vital signs.

Health Assessment

- Purposes.
- Process of Health assessment.

Documentation

- Purposes of Recording and reporting.
- Guidelines for Reporting: Factual Basis, Accuracy, Completeness, Current issue, Organization and Confidentiality.
- Methods of Recording.

Meeting patient needs

Hygienic needs, Nutritional needs, Elimination needs, Comfort needs, Psychological needs,

Infection control

- Organization of the Infection Control Programme at the CMCH.
- Surveillance & Reporting of Infection.
- Employee Health Programme.
- Preventing Transmission of Blood Borne Pathogens.
- Regulation of Staff with Specific Diseases.
- Techniques.
- Care of Access Systems, Indwelling Devices and Wound.
- Isolation Policies and Procedures.
- Disinfection and Sterilization.
- Hospital Waste Management.
- Housekeeping.
- Common Areas of Patient Care.
- Specific Areas of Patient Care.
- Outbreak Management.
-

References- Hospital Infection Control Manual, 6th edition 2015, CMC, Vellore.

Syllabus for Option 2. (Disaster management & human resource management)

Disaster management

Introduction to disaster

- What is Disaster Management?
- Aim of Disaster Management
- Types of Disasters
- Identifying potential Disasters
- Risk and threats

Disaster Management Process

- Prevention / Mitigation
- Preparedness
- Response
- Recovery
- Rehabilitation

Hospital Disaster Preparedness and Emergency Response Plan

- Introduction to Hospital Emergency Incidence Command System (HEICS)
- Basic Units of HEICS.
- Job action sheets/ cards.
- Disaster Triage.
- Types of Triage.
- Triage exercise (Practical exercise)

Mock drills in a healthcare facility

- Disaster codes
- Fire drill

References:

- CMAI Disaster management workshop.
- EHA – Emergency Response framework.
- WHO – Disaster management.

Human resource management

Recruitment and selection

- Definition
- Recruitment and Planning
- Process of Recruitment
- Flow chart of recruitment
- Joining Formalities

Performance appraisal

- Definition
- Types of Performance appraisal
- Procedure of appraisal
- Importance of appraisal

Compensation and Benefits

- Definition
- Different types of Compensation and Benefits

Business communication

- Definition
- Business writing

Disciplinary procedures and employee misconduct

- Definition
- Important of Disciplinary procedure

Grievance and its procedures

- Definition of Employee Grievance
- Procedure of Employee Grievances
- Importance of Grievance procedure

Exit Interview

- Definition
- Procedure of Exit Interview
- Importance of Exit Interview

Reference:

1. Human Resource Management - by Biswajeet P
2. Human Resource Development - by P Murali Krishna
3. Human Resource Management in Hospitals - D Samuel Abraham

SYLLABUS FOR OPTION 3. (SOCIAL PSYCHOLOGY & COUNSELLING)

Basic skills of counseling, Basics of Theory and Practice of Counseling and Psychotherapy, Basics of group counseling and its dynamics

Social Self

Self and identity. Culture and development of self. Social cognition; impression management

Attribution, bias and errors in attribution.

Prejudice, stereotypes and discrimination;

Attitude organization; methods of attitudes change

Social Relationships

Nature, dimensions and dynamics of interpersonal relationships; Interpersonal attraction;

Sexuality and intimacy; Alternate gender/ sexual minorities

Altruism: Influences of helping; Long-term helpfulness

Aggression: Nature and characteristics; Violence- sexual harassment, domestic violence, terrorism.

Culture and Behaviour

Cross-cultural psychology.

Diversity in socialization; Individualism in a collectivistic culture; Poverty and deprivation. Culture and psychopathology; Traditional healing methods for mental illness.

Social and Cultural Issues

Gender and mental health

Complex environment and behaviour

Social psychology in educational context

Social psychology at work- application in job satisfaction and performance

References: Berry, J.W., Mishra, R.C. &Tripathi, R.C. (Eds). (2003). *Psychology in human and social development: lessons from diverse cultures*. New Delhi: Sage
Dasen, P.R. Berry, J.W. & Sartorius, N. (1988) (Eds.). *Health and cross- cultural psychology: toward applications*. New Delhi: Sage.