THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY, CHENNAI –

32. REGULATIONS - M.Sc. CRITICAL CARE TECHNOLOGY (Post-

Graduate Degree courses under Allied Health Sciences)

In exercise of the powers conferred by Section 44 of the Tamil Nadu Dr. M.G.R. Medical University, Chennai Act 1987 (Tamil Nadu Act 37 of 1987) the Standing Academic Board of the Tamil Nadu Dr. M.G.R. Medical university, Chennai hereby makes the following regulations:-

SHORT TITLE AND COMMENCEMENT

These regulations shall be called as "POST GRADUATE COURSE IN M.Sc. CRITICAL CARE TECHNOLOGY UNDER ALLIED HEALTH SCIENCES" of the Tamil Nadu Dr. M.G.R. Medical University, Chennai

They shall come into force from the academic year 2015-2016.

The regulations framed are subjected to modification from time to time by the Standing Academic Board.

OVER ALL OBJECTIVES

The M.Sc. Degree course in Critical Care Technology under Allied Health Sciences is prepared to assist Doctors for providing High Quality Patient Care in Advanced Critical Care setting in the Hospital and Community.

ELIGIBILITY FOR ADMISSION

The Minimum qualification for admission into M.Sc. Critical Care Technology will be B.Sc. Critical Care Technology/ B.Sc. Accident and Emergency Care Technology/B.Sc. Cardiac Technology/B.Sc. Cardio Pulmonary Perfusion Care Technology / B.Sc. Dialysis Technology / B.Sc. Operation Theatre and Anesthesia Technology/B.Sc. Nursing / Post- Basic B.Sc. Nursing with the minimum of 50% aggregate mark with 2 Years of Work Experience after B.Sc Degree.

Branches of Critical Care Technology

1) Branch I – General Critical Care and Respiratory Critical Care
   Minimum qualification for admission –
   1. B.Sc. Critical Care Technology
   2. B.Sc. Nursing
   3. B.Sc. Post – Basic Nursing
   4. B.Sc. Accident and Emergency Care Technology
   5. B.Sc. Cardiac Technology
   6. B.Sc. Operation Theatre and Anesthesia Technology
2) Branch II – General Critical Care and Cardiac Critical Care
   Minimum qualification for admission –
   1. B.Sc. Critical Care Technology
   2. B.Sc. Nursing
   3. B.Sc. Cardiac Technology
   4. B.Sc. Post – Basic Nursing
   5. B.Sc. Cardio Pulmonary Perfusion Technology
   6. B.Sc. Cardiac Technology
   7. B.Sc. Operation Theatre and Anesthesia Technology

3) Branch III – General Critical Care and Renal Critical Care
   Minimum qualification for admission –
   1. B.Sc. Critical Care Technology
   2. B.Sc. Nursing
   3. B.Sc. Post – Basic Nursing
   4. B.Sc. Dialysis Technology
4) Branch IV – General Critical Care and Neuro Critical Care
   Minimum qualification for admission –
   1. B.Sc. Critical Care Technology
   2. B.Sc. Nursing
   3. B.Sc. Post – Basic Nursing
   4. B.Sc. Accident and Emergency Care Technology

AGE LIMIT FOR ADMISSION

A candidate should have completed the age of 22 years at the time of admission to the M.Sc. Critical Care Technology.

REGISTRATION

A candidate admitted to M.Sc. Critical Care Technology course under Allied Health Sciences in any one of the affiliated institutions of this University shall register his/her name with this University by submitting the prescribed application form for registration duly filled, along with the prescribed fee and a declaration in the format to the Academic Officer of this University through the affiliated Institution within 30 days from the cut- off date prescribed for the course for admission. The application should have the date of admission of the course.

COMMENCEMENT OF THE COURSE:

The course shall commence from 1st September of the Academic Year.

MEDIUM OF INSTRUCTION

English shall be the Medium of Instruction for all the Subjects of study and for examinations of the M.Sc. Critical Care Technology Course under Allied Health Sciences.

CURRICULUM

The curriculum and the syllabus for the course shall be prescribed in these regulations and are subject to modifications by the Standing Academic Board from time to time.

DURATION OF THE COURSE

The duration of certified study for the M.Sc. Critical Care Technology under Allied Health Sciences course shall extend over a period of three academic years.

The candidate should complete this course in 6 years (double the duration) from the date of joining the course.

RE-ADMISSION AFTER BREAK OF STUDY

The regulations for re- admission are as per the University Common Regulation and Re-admission after Break of Study for all courses.

WORKING DAYS IN THE ACADEMIC YEAR

Each Academic year shall consist of not less than 270 Working Days.

ATTENDANCE REQUIRED FOR ADMISSIONS TO APPEAR FOR EXAMINATION

1. No candidate shall be permitted to appear in any one of the parts of M.Sc. Critical Care Technology course under Allied Health Sciences Examinations unless he/she has attended the course in the subject for the prescribed period in an affiliated institution recognized by this University and produce the necessary certificate of Study, attendance and satisfactory conduct from the Head of the Institution.
2. A Candidate is required to put in a minimum of 85% of attendance out of 270 working days in both theory and practical separately in each subject before admission to the examination except for 1 year candidates where attendance will be counted from the date of joining. The academic year should consist of not less than 270 working days

CONDONATION OF LACK OF ATTENDANCE

There shall be no condonation of lack of attendance.

VACATION

There is no vacation

INTERNAL ASSESSMENT MARK

The Internal Assessment should consist of the following points for evaluation

Theory
Practical/Clinical
Viva

Note

1. A minimum of two written examinations shall be conducted in each subject during a year and the average marks of the three performances shall be taken into consideration for the award of Internal Assessment marks
2. A minimum of one practical examination shall be conducted in each subject (wherever practical has been included in the curriculum) and grades of ongoing clinical evaluation to be considered for the award of Internal Assessment Marks.

CUT-OFF DATES FOR ADMISSION TO EXAMINATION

1. 31st October of the Academic Year concerned
2. The candidates admitted up to 30th September of the Academic Year shall be registered to take up 1st year examination during October of the next year.
3. All kinds of admission shall be completed on or before 30th September of the Academic year. There shall not be any admission after 30th September even if seats are vacant

CARRY OVER OF FAILED SUBJECTS

1. A candidate has to pass in theory and practical examinations separately in each of the paper
2. If a candidate fails in either theory or practical examination, he /she has to reappear for both (theory and practical)
3. The candidate has to successfully complete the course in double the duration of the course (i.e. 6 years from date of joining)

NUMBER OF EXAMINERS

One Internal and External examiner should jointly conduct practical/oral examination for each student

REVALUATION/RETOTALING OF ANSWER PAPERS

Revaluation/Re-totaling of answer papers is not permitted

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THE TAMIL NADU DR.M.G.R. MEDICAL UNIVERSITY
CHENNAI – 600 032
SYLLABUS FOR
M.Sc POST GRADUATE DEGREE IN CRITICAL CARE TECHNOLOGY

SCOPE OF M.Sc CRITICAL CARE TECHNOLOGY

There is unprecedented demand for Critical Care services globally. Advances in technology and medicine mean that increasing numbers of severely ill patients are surviving with a corresponding need for intensive medical and surgical care.

Critically ill patients are defined as those patients who are at high risk for actual or potential life -threatening health problems. The critically ill the patient is, the more likely he or she is to be highly vulnerable, unstable and complex, thereby requiring intense and vigilant health care.
Critical care Technology is a sub-specialty in allied health course that deals specifically with human responses to life- threatening problems
M.Sc Critical Care Technology course will provide adequate knowledge and skills and prepare the students to work in a variety of critical care settings

M.Sc Critical Care Technology program qualifies him or her to independently perform comprehensive health assessment, order and interpret full spectrum of diagnostic tests and procedures, under the supervision of a critical care specialist, perform special procedures related to the care of the critically ill as instructed and supervised by the intensive care specialist and evaluate the outcomes of intervention.

M.Sc Critical Care Technology is characterized by the application of relevant theories, research, and evidence-based guidelines to explain human behavior and related phenomena.

The purpose of post graduation in Critical Care Technology is to meet the specialized physiologic as well as psychological needs of patient with acute, critical or complex health condition in various critical care setting.

PHILOSOPHY

1. M.Sc Critical Care Technology prepares a critical care technician to meet the complex needs of critically ill patients and developing the knowledge base along with specialist skills in both the technological and the caring dimensions.
2. M.Sc Critical Care Technology emphasizes application of relevant theories into practice, education, administration and development of research skills.
3. M.Sc Critical Care Technology prepares Critical Care Technician in health fields as advanced critical care technologists to assist critical care specialists and consultants in education, administration and research in a wide variety of critical care settings.
4. M.Sc Critical Care Technology empowers their sound and rapid clinical judgements in vide variety of critical care settings and to recognize and deal with the ethical issues inherent in such an environment.

AIM

The aim of the M.Sc Critical Care Technology is to prepare postgraduates to assume major responsibilities in the critical care setting to assist the critical care specialists and consultants in in patient care, education and administration in the critical care setting.

OBJECTIVES

On Completion of the three years M.Sc Critical Care Technology programme, the graduate will be able to:-

1. Demonstrate advance competence in critical care setting
2. Practice as an Advanced Critical Care Technologist.
3. Apply theories into practice, education, administration and development of research skills.
4. Demonstrate skill in conducting research in critical care, interpreting and utilizing the findings from health related research.
5. Establish collaborative relationship with members of other disciplines
6. Demonstrate interest in continued learning for personal and professional advancement

GUIDELINES AND MINIMUM REQUIREMENTS TO START M.Sc CRITICAL CARE TECHNOLOGY

The institution should be recognized for B.Sc. Critical Care Technology programme and one batch should have passed out to start M.Sc. Critical Care Technology programme.
The Tamil Nadu Dr. M.G.R Medical University on receipt of the proposal from the Institution to start M.Sc. Critical Care Technology will undertake the first inspection to assess suitability with regard to physical infrastructure, clinical facility and teaching faculty in order to give permission to start the programme.
Institution will admit from the students only after taking approval from The Tamil Nadu Dr. M.G.R Medical University.
The Institutions are permitted to take maximum of 3 students of M.Sc. Critical Care Technology programme annually in each branch of Critical Care Technology (Course Director: Student 1:3).

BRANCHES OF CRITICAL CARE TECHNOLOGY

Branch I – General Critical Care and Respiratory Critical Care

Minimum qualification for admission – B.Sc. Critical Care Technology /B.Sc. Nursing/B.Sc. Post – Basic Nursing/ B.Sc. Accident and Emergency Care Technology/B.Sc. Cardiac Technology/B.Sc. Operation Theatre and Anesthesia Technology

Branch II – General Critical Care and Cardiac Critical Care

Minimum qualification for admission – B.Sc. Cardiac Technology /B.Sc. Critical Care Technology /B.Sc. Nursing/B.Sc. Post – Basic Nursing/B.Sc. Cardio Pulmonary Perfusion Technology/ B.Sc. Cardiac Technology /B.Sc. Operation Theatre and Anesthesia Technology

Branch III – General Critical Care and Renal Critical Care

Minimum qualification for admission – B.Sc. Critical Care Technology /B.Sc. Nursing/B.Sc. Post – Basic Nursing/B.Sc. Dialysis Technology

Branch IV – General Critical Care and Neuro Critical Care

Minimum qualification for admission – B.Sc. Critical Care Technology /B.Sc. Nursing/B.Sc. Post – Basic Nursing/B.Sc. Accident and emergency Care Technology

ELIGIBILITY CRITERIA/ADMISSION REQUIREMENTS

The Minimum qualification for admission into M.Sc. Critical Care Technology will be B.Sc. Critical Care Technology/ B.Sc. Accident and Emergency Care Technology/B.Sc. Cardiac Technology/B.Sc. Cardio Pulmonary Perfusion care Technology/B.Sc. Dialysis Technology/B.Sc. Operation Theatre and Anesthesia Technology/B.Sc. Nursing /Post-Basic B.Sc. Nursing with the minimum of 50% aggregate mark.

ELIGIBILITY FOR APPEARING FOR THE EXAMINATION

85% of the attendance for theory and practicals

Classification of results

1. 50% pass in each of the theory and practical separately.
2. If the candidate fails in either practicals or theory paper he/she has to reappear for both the papers (theory and practical)
3. The candidate should complete this course in 6 years (double the duration) form the date of joining the course.
4. Candidate, who fails in any subject, shall be permitted to continue the studies into the second year. However the candidate shall not be allowed to appear for the final year examination till such time that he/she passes all subjects of the first and second year M.Sc critical care technology examination.

Scheme of Examination

Minimum pass marks shall be 50 % in each of the Theory and practical papers separately.

A candidate must have minimum of 90% attendance (irrespective of the kind of absence) in theory and practical in each subject for appearing for examination.

A candidate has to pass in theory and practical exam separately in each of the paper. If a candidate fails in either theory or practical paper he/she has to re-appear for both the papers (Theory and practical).

All practical examinations must be held in the respective clinical areas.

One internal and One external examiners should jointly conduct practical examination for each student

One internal and One external examiners should evaluate dissertation and jointly conduct viva-voce for each student

For Dissertation Internal examiner should be the guide and External examiner should be the Faculty of Critical care

FACILITIES

Faculty

1. Teaching and Non-Teaching Faculty
2. Clinical facilities
3. Physical infrastructure

1. Faculty

Staff Requirements

Course Director : M.D. (Anesthesiology)
M.D. (General Medicine) / Super specialty DM in Cardiology/Neurology

The Course Director should have a Post-Graduate qualification with 8 years experience. Teaching Faculty : **Part Time Lectures**

MD (General Medicine)	-	1
MD (Anesthesiology)	-	1
MS (General Surgery)	-	1
MD (O&G)	-	1
MS (Orthopedic Surgery)	-	1
MCh (Neuro Surgery)	-	1
MCh (Cardio Thoracic surgery)	-	1

The Part-time lecturers should have an experience of 2 years after Post-Graduate qualification.

Non-Teaching Faculty :	Administrative Officer	-	1
	Accountant	-	1
	Clerical Staff	-	1

2. Clinical Facility

Bed Strength : Own or Tie-up with 100 bedded hospital (Surgical ICU – 5 beds, Medical ICU – 8 beds)

Equipments : Mechanical ventilators
Multi channel monitors
Pulse oximeter
ETCO2
Hemodialysis
ECG Monitors
Defibrillator
Infusion Pumps
Syringe pumps
CRRT
Bedside Echocardiography & Ultrasound
Other standard equipments
Own CT scan and MRI or should have tie-up

Supportive services : Arterial Blood Gas Analysis
Clinical Biochemistry
Radiology – Portable X-Ray
Electrocardiogram – ECG
Blood Bank (tie up with local blood bank)

3. Physical infrastructure

Class Room	:	Two Class Rooms – 150 sq ft. each One Conference Hall
Library	:	Minimum – 500 Books International and Indian Journals Internet facility Photocopy and Printing facility
Laboratory/Skill Lab	:	Airway Mannequin CPR Mannequin CVC Mannequin Basic Model Mannequin Paediatric Mannequin

COURSE OUTLINE

I Year - Advance Basic Sciences applicable to Critical Care (Anatomy, Physiology, Biochemistry, Pharmacology, Pathology & Microbiology)

Paper I	Applied Anatomy and Physiology related to Critical Care
Paper II	Applied Biochemistry and Pharmacology related to Critical Care
Paper III	Applied Pathology and Microbiology related to Critical Care

NO PRACTICALS FOR FIRST YEAR

II Year - General critical care and introduction to research methodology ICU monitoring (basic and advanced), ICU therapy (basic and advanced), biomedical engineering, equipment maintenance, ICU administration, logistics, ethics and communication)

Paper I	General Critical Care (General critical care including ICU Monitoring, Equipment Maintenance and Therapy)
Paper II	General Critical Care including Biomedical Engineering, ICU Administration, Logistics, Ethics, Communication Research, Management and Statistics

III Year -Advanced Critical care – related to the specialty

Branch I:Advanced Respiratory Critical Care Technology
Branch II:Advanced Cardiac Critical Care Technology
Branch III: Advanced Nephro Critical Care Technology
Branch IV: Advanced Neuro Critical Care Technology

Advanced Critical Care Part I	Paper I
Advanced Critical Care Part II	Paper II

APPLIED ANATOMY & PHYSIOLOGY

Placement: I year **Theory: 50 Hrs, Practical: 60 Hrs**

Paper I

COURSE DESCRIPTION

This course is designed to assist students in developing an in depth knowledge in the field of Applied Anatomy and Physiology.

OBJECTIVES

At the end of the course the students will be able to acquire knowledge and develop proficiency in the Anatomical and Physiological aspects of patients with medical and surgical disorders in various health care settings.

CONTENT OUTLINE Block

I: Applied Anatomy

Unit	Course Content	Theory	Practical
1	Introduction to anatomy Section 1: Anatomical terms, planes, and relations etc.	5	10
2	Respiratory system Section 1: Anatomy of thoracic cage bones- *Ribs, spine* *Diaphragm, Intercostal Muscles* *Blood Supply and Nerve Supply* Section 2: Anatomy of upper respiratory tract (Nose to Larynx) *Nose, nasopharynx* *Oral cavity, tongue, oropharynx* *Laryngopharynx* *Blood and nerve supply* Section 3: Anatomy of the lungs (Trachea to bronchial tree) Lungs with bronchopulmonary segments Pleural Blood and nerve supply	10	15
3	Cardiovascular System Section 1: Heart, Pericardium, Myocardium, Endocardium, valves Section 2: Major vessels of circulatory system –	10	15

	Aorta IVC Pulmonary vessels and all major branches		

	Section 3: Coronary circulation		
4	Central Nervous System Section 1: Basic organization of the nervous system Central –Brain, Spinal cord Peripheral Autonomic nervous system o Sympathetic nervous system o Parasympathetic nervous system Section 2: Cerebral circulation Circle of Willis Blood supply of spinal cord Section 3: Pain pathway	10	10
5	Excretory System Section 1: Kidney, Ureter, and Bladder, Blood, Nerve supply	8	5
6	Abdomen Section 1: Liver, pancreas, islet cells Section 2: Thyroid, parathyroid, adrenals	7	5

Block II: Applied Physiology

Theory: 30 Hrs, Practical: 50 Hrs

Unit	Course Content	Hours	
		Theory	Practical
1	Respiratory System Section 1: Homeostasis Section 2: Physiology of Breathing Regulation of respiration Respiratory movements Chest wall mechanics- pressure, volumes, resistance, compliance Lung volume and capacities Work of breathing Section 3: Gas Transport Oxygen transport Carbon dioxide transport	20	30

	Factors affecting		

	oxygen transport Mechanism of hypoxia V/Q mismatch. Section 4: Acid Base Balance Section 5: Artificial airway Indications For o Relieving airway obstruction oSecretion removal o Protecting the airway oPositive pressure o Ventilation Selecting &Establishing An Artificial Airway o Nasal airways oPharyngeal airways oTracheal airways Airway Clearance Techniques o Airway suctioning o Bronchoscope Airway o Securing the airway & confirming placement oProviding adequate humidification oMinimizing nosocomial infections o Providing cuff care oFacilitating clearance of secretion oTrouble shooting airway emergencies Extubation oIndication		

		o Procedure oPost Extubation – care and complication Section 6: Oxygen Therapy Sources of Oxygen for therapy Storage of Oxygen Oxygen delivery system Hazards of Oxygen Section 7: Chest X-Ray Normal Chest X- Ray o Normal anatomy o Basic physics of X –ray and assessment of film quality o Cardiac configuration o Lung fields and airway oOptimum position of – Endotracheal tubes, Nasogastric tubes, Central lines Abnormal Chest X- Ray o Trauma o Pneumothorax o Hemothorax oLung contusion oPulmonary edema o ARDS o Pneumonia oBronchopneu monia oLobar pneumonia oAspiration pneumonia		
2	Cardiovascular System Section 1: Cardiac cycle Cardiac output - Factors affecting cardiac output Preload, after load, stroke volume, contractility		5	10

	Principles of ECG, Normal ECG Section 2: O_2 delivery, uptake in tissues Section 3: Blood pressure Maintenance of normal BP and factors affecting it Systolic, diastolic, pulse pressure, mean arterial pressure		
3	Central Nervous System Section 1: Cerebral auto regulation, cerebral oxygen consumption, Coma Section 2: Cerebrospinal fluid, intracranial pressure Section 3: Cranial nerves III, IV, VI IX, X, Cough reflex, gag reflex Pupils: accommodation reflex, light reflex Section 4: Sedation and analgesia Section 5: Brain death	5	10

PRACTICAL:

Clinical Evaluation
- Case Study/ Case Book
- Practical Record

Observational/ Field Visit

Each student should be given planned healthcare teaching by conducting clinical teachings and case presentations

METHODS OF TEACHING
- Lecture cum discussion
- Demonstration

Lab visit

Practical work record

METHODS OF EVALUATION
- Written Test
- Record Book
- Assignments

Oral Presentations

RECOMMENDED BOOKS

1. Cohen, Memmler: Structure & Function of Human Body, Lippincott Williams & Wilkins; Tenth edition (2012).
2. Waugh: Ross & Wilson Anatomy & Physiology in health and illness Penguin Books Ltd (2010)
3. Tortora: Anatomy & Physiology, John Wiley & Sons (2012)
4. Chaurasia: Human Anatomy CBS Publishers (2012)
5. Standring: Gray's Anatomy Penguin Books Ltd (2008)
6. Venkatesh D: Basics of Medical Physiology for Nursing, LWW (2009).
7. Hall J: Guyton Textbook of Medical Physiology. Elsevier (2012).
8. Tandon: Best & Taylor's Physiologic Basis of Medical Practice (2011).

APPLIED BIOCHEMISTRY & PHARMOCOLOGY

Placement I Year
Paper II

Block I: Applied Biochemistry **Theory: 25 Hrs, Practical: 30 Hrs**

COURSE DESCRIPTION

The course is designed to assist students to acquire the knowledge of the normal biochemical functioning of human body and alterations.

OBJECTIVES

At the end of the course, the student will be able to

1. Identify the basic principles of biochemistry.
2. Synthesize the knowledge of these principles in various situations.

COURSE CONTENT

Unit	Course Content	Theory	Practicals
1	Carbohydrates Section 1: Glucose & Glycogen metabolism	2	2
2	Proteins Section 1: Classification of Proteins and functions	2	3
3	Lipids Section 1: Classification of Lipids and functions	2	3
4	Enzymes Section 1:Definition, Nomenclature, and Classification Section 2: Factors affecting enzymes activity Section 3: Active site, Co-enzyme, enzymes inhibition, units of enzymes, iso enzymes, enzyme pattern in disease	5	6
5	Vitamins & Minerals Section 1: Fats soluble vitamins (A, D, E, K) Section 2: Water soluble vitamins (B complex vitamin) Section 3: Principle elements (Calcium, Phosphorus, Magnesium, Sodium, Potassium) Section 4: Trace elements: Calorific value of foods – Basal Metabolic Rate (BMR) - Respiratory Quotient (RQ), Specific Dynamic Action (SDA), Balanced diet Section 5 : Nutrition Marasmus, Kwashiorkor Assessment of nutrition requirements Normal requirements of calories, proteins, fluid, electrolytes Fluid balance and electrolytes	10	12
6	Acids Base Balance Section 1: Definition, pH values, Henderson – Hasselbach equation, Buffers Section 2: Indicators, Normality, Molarity, and Molality	4	4

PRACTICALS

Benedict's test
Heat coagulation tests

METHODS OF TEACHING

Lecture cum discussion
Demonstration
Lab visit
Practical work record

METHODS OF EVALUATION

Written Test
Record Book
Assignments
Oral Presentations

RECOMMENDED BOOKS

1. U. Sathyanarayana: Essentials of biochemistry. Books & Allied Publications(2013)
2. Ambika Shanmugam: Fundamentals of Biochemistry. Lippincott India (2013) A. C. Deb: Fundamentals of Biochemistry (2001)
3. Murray: Harper's biochemistry. Mac-Graw Hill (2012)
4. Ferrier: Lippincott's Biochemistry. LWW(2013)

Block II: Applied Pharmacology

Placement I Year **Theory: 35 Hrs**
Paper II

COURSE DESCRIPTION

The course is designed to assist students to acquire understanding of fundamentals of drugs and their mode of action. It also provides opportunities for practicing infection control measures in hospital settings. It also helps to assist the students to use knowledge of pharmacology in practice of critical care technology.

OBJECTIVES

At the end of the course, the student will be able to:

To identify drugs used in ICU and describe their pharmacology, administration, uses and adverse effects

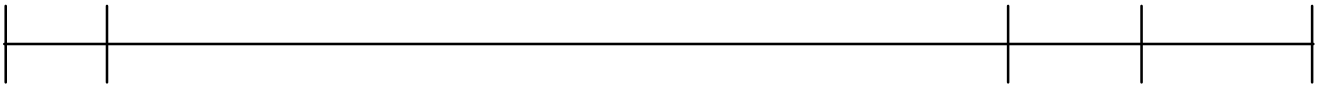
To describe pharmacology of vasopressors and inotropes

COURSE CONTENT

Unit	Course Content	Theory	Practical
1	Introduction to pharmacology Section 1: Pharmacokinetics Section 2: Pharmacodynamics Drug dose calculation – Dilution, infusion rate	2	
2	Medical gases: O_2, N_2O, compressed Air	2	
3	Anaesthetic agents Section1: Sedatives: Barbiturates, Benzodiazepines, Propofol, and Ketamine Section 2: Analgesics: NSAID's, Aspirin, Opioids Section 3: Neuromuscular blockers	5	
4	Drugs Affecting The Autonomic Nervous System Section 1: Adrenergic drugs Inotropic agents, Chronotropic agents Vasopressors & Vasodilators Anti-hypertensive Bronchodilators Section 2: Cholinergic drugs Atropine, Glycopyrolate Ipratropium	7	
5	Mucokinetics agents: Section 1: Expectorant Section 2: Mucolytics Section 3: Mucokinetics Section 4: Mucoregulatory agents	5	

Section 5: Others e.g. Bromohexine, Ambroxol, Saline, Soda Bicarbonate

6	Cough suppressants	4



	Section 1: Peripheral anti tussives Section 2: Central anti tussives Section 3: Peripheral and central anti tussives		
7	Respiratory stimulants Section 1: Specific. E.g: Naloxone, Flumazenil Section 2: Non-specific. E.g. Xanthenes, Nicotine, Doxapram	3	
8	Antihistamines	2	
9	Steroids	2	
10	Antimicrobial drugs Section 1: Antibacterial, antiviral and anti-fungal agents – basic concepts Section 2: Antimicrobial Resistance – Basic concepts Section 3: Antiseptic agents	3	

METHODS OF TEACHING

Lecture cum discussion
Demonstration
Practical work record

METHODS OF EVALUATION

Written Test
Record Book
Assignments
Oral Presentations

RECOMMENDED BOOKS

1. Tripathi K. D: Essentials of Medical Pharmacology. JPB, (2013)
2. Smeltzer – Brunner & Siddhartha Textbook of Medical Surgical Nursing, 2010,LWW
3. Black – Medical Surgical Nursing, 2009, Elsevier
4. Nettina – Lippincott manual of Nursing Practice, 2009. LWW
5. Lewis – medical Surgical Nursing, 2008, Elsevier

APPLIED PATHOLOGY & MICROBIOLOGY

Placement I Year
Paper II

Block I: Applied Pathology **Theory: 60 Hrs**

COURSE DESCRIPTION
The course is designed o assist students to acquire the knowledge of the fundamentals of pathology in disease states.

OBJECTIVES
At the end of the course, the student will be able to describe the basic pathology of the important disease states of respiratory system, cardiovascular system, CNS, hematology, renal and GI system in ICU settings.

COURSE CONTENT

Unit	Course Content	Hours	
		Theory	Practical
1	General Section 1: Inflammation and healing Section 2: Tumors Section 3: Immune system	4	
2	Respiratory system Section 1: Respiratory failure Section 2: Adult respiratory distress syndrome Section 3: Pneumonia, TB Section 4: Opportunistic infections Section 5: Bronchial asthma and COPD Section 6: Bronchiectasis and Lung abscess Section 7: Atelectasis, collapse Section 8: Pleural disease: Pneumothorax, pleural effusion Section 9: Occupational lung diseases - Smoke inhalation , Pneumoconiosis	10	
3	Cardiovascular Section 1: Shock: Hypovolemic, Cardiogenic, Obstructive, Septic Section 2: Hypertension in ICU Section 3: Congestive cardiac failure, Acute Left Ventricular Failure, Right Ventricular Failure Section 4: Pulmonary edema Section 5: Pulmonary Hypertension Section 6: Pulmonary embolism Section 7: Ischemic heart disease	15	
4	CNS Section 1: Cerebro Vascular Disease (Stroke) Section 2: Coma	10	

	Section 3: Delirium in ICU Section 4: Neuromuscular disease Myasthenia gravis Critical Illness Polyneuropathy Diaphragmatic paralysis Section 5: Guillian Barre syndrome Section 6: Brain death, Persistent vegetative state Section 7: Trauma Head injury Unstable spine and protection		
5	Hematology Section 1: Anemia in ICU Section 2: Neutropenia Section 3: Bleeding disorders Section 4: Clotting disorders	6	
6	GIT, Liver, Pancreas, Renal, Endocrine Section 1: Upper GI bleed Section 2: Hepatic coma Section 3: Pancreatitis Section 4: Renal failure in ICU Section 5: Hypoglycemia Section 6: Hyperglycemia Section 7: Disorders Sodium, Potassium and Fluid balance Section 8: Stress response role of Adrenal	10	
7	Miscellaneous Section 1: Envenomation – snake bite, scorpion sting Section 2: Poisoning – general supportive care, common poisons	5	

PRACTICALS – NONE

METHODS OF TEACHING

Lecture cum discussion
Demonstration
Practical work record

METHODS OF EVALUATION

Written Test
Record Book
Assignments
Oral Presentations

RECOMMENDED BOOKS

1. Smeltzer – Brunner & Suddharth- Textbook of Medical Surgical Nursing, 2010,LWW
2. Black – Medical Surgical Nursing, 2009, Elsevier
3. Nettina – Lippincott manual of Nursing Practice, 2009. LWW
4. Lewis – medical Surgical Nursing, 2008, Elsevier
5. Davidson's Principles &Practice of Medicine, 2010, Elsevier
6. Bailey & Love Short Practice of Surgery, 2008, Hodder Arnold
7. Timby – Introductory Medical Surgical Nursing, 2009, WK
8. Das – textbook of Surgery, SD Publishers
9. Woods – Cardiac Nursing, 2010, LWW
10. Hickey – Neurologic & Neurosurgical Nursing, 2009, LWW

11. Morton – Critical Care Nursing, 2009, LWW
12. Thelan's Critical Care Nursing, 2008, Elsevier
13. Spring House – Medical Surgical Nursing Made Incredibly Easy, 2008, LWW
14. Webber – Health assessment in Nursing, 2010, WK

Block II: Applied Microbiology

Placement I
Year Paper II

Theory: 25 Hrs, Practical: 35 Hrs

COURSE DESCRIPTION

The course is designed to assist students to acquire understanding of fundamentals of microbiology and identification of microorganisms. It also provides opportunities for practicing infection control measures in hospital settings

OBJECTIVES

At the end of the course, the student will be able to:

- Identify common disease producing microorganisms
- Explain the basic principles of microbiology and their significance in health and disease. Demonstrate skill in handling specimens
- Explain various methods of disinfection and sterilization
- Identify the role of the nurse in hospital infection control system

COURSE CONTENT

Unit	Course Content	Hours	
		Theory	Practical
1	Introduction to microorganisms Section 1: Microbiological terms Section 2: History of microbiology	2	5
2	Major groups of microorganisms Section 1: Structure and classification of microbes Section 2: Identification methods of microorganisms	5	5
3	Infection control Section1: Introduction to infection, spread and transmission of infection Section 2: Sterilization and disinfection Section 3: Cleaning and sterilizing equipment Section 4: Disposal of waste Section 5: Surveillance, quality control Section 6: Control of organisms with antibiotics Section7: Vaccines, Toxoids – bacterial, viral, immunization schedule Section 8: Barrier nursing, universal precautions	10	15
4	Specific infections Section 1: Nosocomial infections – VAP, CRBSI, UTI Section 2: Bacterial - Tb Section 3: Viral – HIV, Hep B Section 4: Fungal Section 5: Parasitic Section 6: Tropical infections - TB, Malaria, Leptospirosis, Dengue, Rickettsia, Amoebiasis Section 7: Sepsis	8	10

PRACTICALS

Collection and handling of clinical specimens-urine, sputum, blood and pus
Demonstration and handling of microscope
Staining-gram staining, Zeihl Neelsen
Common examination: stained smears, Fungus-Yeasts and Molds
Sterilization-incineration and Autoclaving
Each student will practice aseptic procedures in the wards and maintain personal and Environmental hygiene.
Observation visit to incinerator, posting in CSSD and infection control department

METHODS OF TEACHING

Lecture cum discussion
Demonstration
Lab visit
Practical work record

METHODS OF EVALUATION

Written Test
Record Book
Assignments
Oral Presentations

RECOMMENDED BOOKS

1. Ananthnarayan R: Textbook of Microbiology. Orient Blackswan (2013)
2. Pommerville J. C: Fundamentals of Microbiology. Jones and Bartlett learning (2013)

ICU MONITORING I (BASIC)

Placement: II Year **Theory: 45 Hrs, Practical: 30 Hrs**
Paper I: General Critical Care

COURSE DESCRIPTION

This course is designed to enable students to understand the principles of monitoring of respiratory, cardiovascular and other systems of the patients in ICU.

OBJECTIVES

At the end of the course the students will be able to:

To describe the basic principles of monitoring of respiratory system, cardiovascular system, CNS, nutritional status, renal function and liver function of patient in ICU

To identify the benefits and risks of ICU monitoring techniques

To describe monitoring techniques used in ICU for a mechanically ventilated patients To describe monitoring techniques used in ICU for patients in shock

To describe monitoring techniques used in ICU to monitor neurological status, renal function and liver function

COURSE CONTENT

Unit	Course Content	Hours	
		Theory	Practical
1	General monitoring Section 1: Temperature monitoring Principles of temperature monitoring Hypothermia and hyperthermia Section 2:Pulse Section 3:Positioning of patient Section 4:Monitoring for pressure sores	5	5
2	Respiratory System Section 1: Airway monitoring Securing ET tube Cuff pressure Section 2: Monitoring Gas Exchange 1: Oxygenation ABG Pulse Oximetry Oxygen delivery and consumption 2: Ventilation ABG Capnography 3: Calculations Oxygen consumption	20	10

	Alveolar gas equations Dead space Section 3: Monitoring muscle strength, work of breathing		

	Section 4: PFT - Recognize the methods & significance of measuring the following lung volume and flow in the ICU. Tidal volume Vital capacity Peak flow rate Negative inspiratory pressure		
3	Cardiovascular System Section 1: ECG Section 2: NIBP Section 3: Invasive arterial blood pressure Section 4: CVP monitoring Section 5: Zeroing, calibration, trouble shooting of pressure transducers.	10	10
4	Nervous system Section 1: Neurological history and examination, pupils, Muscle strength Section 2: Glasgow Coma Scale Section 3: ICP Monitoring	5	3
5	Abdomen / Renal Section 1: Intra-abdominal pressure monitoring Section 2: Monitoring renal function: Clinical – Urine output Laboratory- Creatinine, creatinine clearance	5	2

PRACTICALS

Assignments

METHODS OF TEACHING

Lecture cum discussion
Demonstration
Practical work record

METHODS OF EVALUATION

Written Test
Record Book
Assignments
Oral Presentations

RECOMMENDED BOOKS

1. Egan's Fundamentals of Respiratory Care – Robert L. Wikins, James K Stoller, Craig L Scalan (Mosby)
2. The ICU Book – Paul L Marino (Lippincott, Williams & Wilkins)
3. Practical Methods for Respiratory Care – Raymond Sibberson (Mosby)
4. Respiratory Physiology – The Essentials l John B West (Williams & Wilkins)
5. Ventilation / Blood Flow & Gas Exchange – John B West (Blackwell Scientific Publications)
6. Techniques in Bedside haemodynamic Monitoring – Elaine Kiess Daily & Johnspeer Schroeder (Mosby)
7. All you really need to know to interpret arterial blood gases – Lawrence Martin (Lea & Febiger)
8. Mechanical Ventilation – Susan P Pilbeam & J M Cairo (Elsevier)

9. Critical Care Secrets: Parsons, Wiener – Kronish, Jaypee Brothers
10. Washington Manual of Critical Care

ICU MONITORING- II (ADVANCED) AND EQUIPMENT MAINTENANCE

Placement: II Year **Theory: 30 Hrs, Practical: 40 Hrs**
Paper I: General Critical Care

COURSE DESCRIPTION

This course is designed to enable students to understand in detail the principles of monitoring of respiratory, cardiovascular and other systems of the patients in ICU. It is designed to assist students in understanding the details of the techniques and equipment used for monitoring the patient in ICU and their troubleshooting.

OBJECTIVES

At the end of the course the students will be able to:

Describe in detail the principles of basic and advanced monitoring of respiratory system, cardiovascular system, CNS, nutritional status, renal function and liver function of patient in ICU

Describe in detail monitoring techniques used in ICU for a mechanically ventilated patients. Describe principles and methods of hemodynamic monitoring.

Describe monitoring of brain stem function and nutritional monitoring.

Describe principles of maintenance of equipment used in ICU.

Describe the various aspects of equipment troubleshooting.

COURSE CONTENT

Unit	Course Content	Hours	
		Theory	Practical
1	Respiratory system Section 1: Monitoring lung and chest wall mechanics Compliance Resistance Pressures Auto PEEP Volumes Section 2: Monitoring muscle strength, work of breathing, Maximum inspiratory and expiratory pressures Section 3: Monitoring patient ventilator system, Graphics monitoring Section 4: Bedside PFT	8	10
2	Cardiovascular System Section 1: Assessment of Preload responsiveness static and dynamic parameters Section 2: Basic Echocardiography in ICU Section 3: Defibrillator and Cardioversion Section 4: PICCO Section 5: Monitoring tissue perfusion	7	10

	Section 7: Temporary pacemaker		
3	CNS Section 1: Monitoring brain stem function Section 2: Sedation and analgesia scoring	2	5
4	Nutritional monitoring Section 1: Functional nutritional assessment (history and physical examination) Section 2: Metabolic assessment Section3 :Estimating nutritional requirements	3	3
5	Care & maintenance if ICU equipment & Troubleshooting (Includes quality checks and calibrations of all the equipment) Section 1: Mechanical Ventilators & Non-invasive ventilators Section 2: Pumps: Infusion, syringe Section 3: Monitors: Stand-alone & multi-parameter, Cardiac Output monitors. Section 4: ECG machine Section 5: ABG machine Section 6: Defibrillator Section 7: Ultrasound machine Section 8: Bronchoscope	10	12

PRACTICALS

Log book and project completion for internal assessment
Should know the workings of all ICU equipment
Should know care and maintenance of all ICU equipment
Should be able to monitor ventilator parameters
Should be able to assess fluid responsiveness in a patient

METHODS OF TEACHING

Lecture cum discussion
Demonstration
Practical work record

METHODS OF EVALUATION

Written Test
Record Book
Assignments
Oral Presentations

RECOMMENDED BOOKS

1. Egan's Fundamentals of Respiratory Care – Robert L. Wikins, James K Stoller,
2. The ICU Book – Paul L Marino (Lippincott, Williams & Wilkins)
3. Practical Methods for Respiratory Care – Raymond Sibberson (Mosby)
4. Respiratory Physiology – The Essentials l John B West (Williams & Wilkins)
5. Ventilation / Blood Flow & Gas Exchange – John B West (Blackwell Scientific Publications)
6. Techniques in Bedside haemodynamic Monitoring – Elaine Kiess Daily & Johnspeer Schroeder (Mosby)
7. All you really need to know to interpret arterial blood gases – Lawrence Martin (Lea & Febiger)
8. Text book of Advanced Cardiac Life Support. American Heart Association
9. Mechanical Ventilation – Susan P Pilbeam & J M Cairo (Elsevier)
10. Critical Care Secrets: Parsons, Wiener – Kronish, Jaypee Brothers

11. Washington Manual of Critical Care

ICU THERAPY

Placement: II Year **Theory: 90 Hrs, Practical: 30 Hrs**
Paper I: General Critical Care

COURSE DESCRIPTION

This course is designed to assist students in developing expertise and in depth knowledge in the field of critical care technology. It will help students to appreciate the patient as a holistic individual and develop skill to function as a specialized critical care technologist.

OBJECTIVES

At the end of the course the students will be able to:

Discuss in detail the concept of Mechanical Ventilation

Describe in detail the design features of ventilators, their types, how they work and the various modes of ventilation

Describe in detail the care of patient on ventilator and weaning from ventilator.

Discuss in detail the Basic and Advanced Life Support.

Discuss in detail the care of unconscious patient.

COURSE CONTENT

Unit	Course Content	Theory	Practical
1	Mechanical ventilation/ventilator dependence/difficult weaning Section 1: Basic Concepts Mechanics of ventilation Mechanics of exhalation Work of breathing Distribution of ventilation Efficiency and effectiveness of ventilation Indications Mechanical Ventilators How ventilators work Operator interface Types of ventilators Section 2: Modes of Mechanical Ventilation Basic and newer modes	45	10

	Ventilator initiation Initial ventilator settings Adjusting ventilatory settings		

	Oxygenation Ventilation Timing – Inspiratory of gas / Expiratory, inspiratory hold Flow Tidal volume Pressure- Peak /Plateau PEEP POP – OFF Pressure support Proximal airway (VS) distal FiO_2 Section 3: Humidification Humidifier types Advantages & disadvantages Section 4: Non-Invasive Ventilation Types of NIV (CPAP, BIPAP) Goals of & indications of NIV Patient selection and exclusion criteria for NIV Equipment used in the application of NIV Instituting and managing NIV Complications of NIV Time & cost associated with NIV Section 5: Trouble shooting and alarms Section 6: Weaning and Extubation Weaning Definitions Reasons for ventilator dependence Patient evaluation Preparing the patient Methods Newer techniques for facilitating ventilator discontinuance Selecting an approach Monitoring the patient during weaning Chronically ventilator dependent patients & difficulty in weaning Terminal weaning Extubation Indications Procedure Post extubation care Section 7: Nebulization and MDI Inhaled drug therapy Nebulization Different types Advantages & disadvantages MDI with spacer Characteristics of therapeutic aerosols Hazards of aerosols therapy Aerosol drug delivery system		

	Assessment based bronchodilator therapy protocols Special considerations Controlling environmental and contamination Section 8: Suctioning and chest physiotherapy Section 9: Incentive Spirometry Section 10: Inspiratory resistance exercises Section 11: Care of Patient on Ventilator Ensuring proper placement Cuff pressure Tracheo bronchial hygiene & suctioning Humidification, chest physiotherapy Ventilator settings Monitoring ventilatory parameters Section 12: Care of the chest tube Drainage systems of pleural with fluid Section 13: Extubation failure		
2	Airway Assistance Section 1: Tracheal intubation (oral, nasal) Section 2: Cricothyrotomy Section 3: Open/percutaneous tracheostomy Section 4: Fiberoptic bronchoscopy FOB Intubation Therapeutic BAL Section 5: Decanulation of tracheostomy	10	2
3	Cardiovascular system Section 1: Fluid resuscitation and ionotropes Section 2: Basic of IABP /ECMO Section 3: Pericardiocentesis	5	2
4	Life support Section 1: Basic life support AED, Mask ventilation, Chest compression Section 2: Advanced cardiac life support Drugs, defibrillation Section 3: Trauma life support A –Airway and cervical spine stabilization B – Breathing C-Circulation and hemorrhage control D –Disability E -Exposure Manual in line stabilization Basic care of surgical wounds and fractures	15	10

	Section 4: Burns Assessment History and physical assessment Assessment of burns and fluid and electrolyte loss Etiology, classification, Pathophysiology, clinical manifestations, Diagnosis, treatment modalities		
5	Renal / Abdomen Section 1: Basics of Renal Replacement Therapy, modes of dialysis	5	2

	Section 2: Intra-abdominal pressure, abdominal compartment syndrome		
6	Central Nervous system Section 1: Care of Unconscious Patient, Comfort Skin integrity assessment and care Physiotherapy – chest & limbs Nutritional needs & supply Section 2: Pain Control, Care of epidural, Patient controlled analgesia	5	2
7	Infection Control Section 1: Hand hygiene Section 2: Universal precautions	5	2

PRACTICAL

1. Clinical rotations in selected Medical and Surgical areas
2. Patient assignments for patient centered comprehensive care
3. Case presentations,
4. Drug study discussion

METHODS OF TEACHING

1. Lecture cum discussion
2. Demonstration
3. Practical work record

METHODS OF EVALUATION

1. Written Test
2. Record Book
3. Assignments
4. Oral Presentations

RECOMMENDED BOOKS

1. Egan's Fundamentals of Respiratory Care – Robert L. Wikins, James K Stoller,
2. The ICU Book – Paul L Marino (Lippincott, Williams & Wilkins)
3. Practical Methods for Respiratory Care – Raymond Sibberson (Mosby)
4. Respiratory Physiology – The Essentials l John B West (Williams & Wilkins)
5. Ventilation / Blood Flow & Gas Exchange – John B West (Blackwell Scientific Publications)
6. Techniques in Bedside haemodynamic Monitoring – Elaine Kiess Daily & Johnspeer Schroeder (Mosby)
7. All you really need to know to interpret arterial blood gases – Lawrence Martin (Lea & Febiger)
8. Text book of Advanced Cardiac Life Support. American Heart Association
9. Mechanical Ventilation – Susan P Pilbeam & J M Cairo (Elsevier)
10. Critical Care Secrets: Parsons, Wiener – Kronish, Jaypee Brothers
11. Washington Manual of Critical Care
12. Smeltzer – Brunner & Suddharth Textbook of Medical Surgical Nursing, 2010,LWW
13. Black – Medical Surgical Nursing, 2009, Elsevier
14. Nettina – Lippincott manual of Nursing Practice, 2013. LWW
15. Lewis – medical Surgical Nursing, 2008, Elsevier
16. Davidson's Principles &Practice of Medicine, 2010, Elsevier
17. Bailey & Love Short Practice of Surgery, 2013, Hodder Arnold

18. Timby – Introductory Medical Surgical Nursing, 2013, WK

19. Das – textbook of Surgery, SD Publishers
20. Woods – Cardiac Nursing, 2010, LWW
21. Hickey – Neurologic & Neurosurgical Nursing, 2009, LWW
22. Morton – Critical Care Nursing, 2009, LWW
23. Thelan's Critical Care Nursing, 2013, Elsevier
24. Spring House – Medical Surgical Nursing Made Incredibly Easy, 2008, LWW
25. Webber – Health assessment in Nursing, 2010, WK

BIOMEDICAL ENGINEERING

Placement: II Year **Theory – 45 hours**
Paper II

COURSE DESCRIPTION

The course is designed to assist students to acquire the knowledge of basics of electricity and electronics. It is also designed to assist students in understanding the basics of the equipment used in the ICU.

OBJECTIVES

At the end of the course, the student will be able to:

Describe fundamentals of Electricity and Electronics.
Describe the types and uses of medical equipment

COURSE CONTENT

Unit	Course Content	Theory	Practical
1	Fundamentals of Electricity & electronics		
	Section 1: Resistance	2	
	Section 2: Capacitance	3	
	Section 3: Inductance and transformers	5	
	Section 4: Parameters of electricity – voltage, current, power	5	
	Section 5: Difference between AC and DC current, phase, neutral, earth, color coding	10	
	Section 6: Ohm's law, Kirchhoff's law – electrical circuits		
	Section 7: Classification of medical equipment	10	
	According to type of protection: B, C, and F etc.		
	According to mode of protection: Class I – III	10	

RESEARCH

Placement: II Year **Theory: 100 hours, Practical: 55 hours**
Paper II

Course Description:
The course is designed to assist the students to acquire an understanding of the research methodology and statistical methods as a basis for identifying research problem, planning and implementing a research plan. It will further enable the students to evaluate research studies and utilize research findings to improve quality of critical care practice, education and management.

General Objectives:
At the end of the course, the concepts.
Review literature utilizing various sources
Describe research methodology students will be able to
Define basic research terms and
Develop a research proposal.
Conduct a research study.
Communicate research findings
Utilize research findings
Critically evaluate research studies.
Write scientific paper for publication.

CONTENT OUTLINE

Unit	Course content	Theory	Practical
1	Introduction: Research – Definition, characteristics and purposes Basic research terms Ethics in research Overview of Research process	10	
2	Review of Literature Importance, purposes, sources, criteria for selection of resources and steps in reviewing literature	5	5
3	Research Approaches and designs Type: Quantitative and Qualitative Experimental and Non Experimental research design characteristics, Advantages and disadvantages Qualitative: Phenomenology, grounded theory, Ethnography	15	

4	Research problem: Identification of research problem Formulation of problem statement and research objectives Assumptions and delimitations Identification of variables Hypothesis	10	5
5	Developing theoretical/conceptual framework. Theories: Nature, characteristics, Purpose and uses Using, testing and developing conceptual framework, models and theories.	5	5
6	Sampling Population and sample Factors influencing sampling Sampling techniques Sample size Probability and sampling error Problems of sampling	10	
7	Tools and methods of Data collection: Concepts of data collection Data sources, methods/techniques quantitative and qualitative Tools for data collection – types, characteristics and their development Validity and reliability of tools Procedure for data collection	15	10
8	Implementing research plan Pilot Study Review research plan (design) Planning for data collection Administration of tool/interventions Collection of data	5	
9	Analysis and interpretation of data Preparing data for computer analysis and presentation Statistical analysis Interpretation of data Conclusion and generalizations Summary and discussion	10	10
10	Reporting and utilizing research findings	5	
11	Critical analysis of case reports	5	8
12	Developing and presenting a research proposal	5	7

Activities

Review of literature of selected topic and reporting

Formulation of problem statement, objective and hypothesis

Developing theoretical/conceptual framework

Preparation of a sample research tool
Analysis and interpretation of given data
Developing and presenting research proposal
Critical evaluation of selected research studies
Writing a scientific paper.

Method of Teaching

Lecture-cum-discussion
Seminar/Presentations
Project
Class room exercises

Methods of Evaluation

Quiz, Tests (Term)
Assignments/Term paper
Presentations
Project work

ICU ADMINISTRATION, LOGISTICS, ETHICS, COMMUNICATIONS, MANAGEMENT AND STATISTICS

Placement: II Year **Theory - 45 hrs, Practical- 60 hrs**
Paper II

COURSE DESCRIPTION

This course is designed to enable students to understand in the principles of ICU administration, patient safety and transport. It is designed to assist students in understanding the principles of medical ethics and communication.

OBJECTIVES

At the end of the course the students will be able to:

Describe the principles of basic ICU administration
Describe various aspects of medical ethics
Describe the medico-legal aspects of medical records
Describe the principles of communication and counseling
Describe all the aspects of patient safety and patient transport
Understand the basic principles of management

COURSE CONTENT

Unit	Course Content	Theory	Practical
1	Basic administration Section 1: Economic issues in ICU Section 2: Raising purchase orders for equipment	6	5

	Section 3: Maintaining consumable stock Section 4: Equipment repair		
2	CSSD Procedures Section 1: Waste disposal collection of used items from user area, reception protective clothing and disinfection safe guards. Section 2: Disinfection in ICU – Surfaces Reusable equipment and accessories Section 3: Wrapping & packing Section 4: General principles of sterilization Moist heat sterilization Dry Heat Sterilization Chemical sterilization EO gas sterilization H_2O_2 gas plasma vap sterilization	12	10
3	Medical ethics Section 1: Medical ethics –Definition – Goal – Scope Section 2: Code of conduct Introduction Basic principles of medical ethics Confidentiality Autonomy and Informed consent – Right of patients Section 3: Care of the terminally ill – Euthanasia, withdrawal, withholding support Section 4: Organ transplantation Section 5: Medico legal aspects of medical records Section 6: Medico-legal case and type – Records and document related to MLC Section 7: Ownership of medical records Section 8: Confidentiality Privilege communication Release of medical information Unauthorized disclosure – retention of medical records – other various aspects.	5	5
4	Communication and counseling Section 1: Basic principles	2	5
5	Basics of statistics Section 1: Basic concepts in measurement Scales of measurements Validity, reliability, variation, measurement system, conversion. Section 2: Basic descriptive statistics Central tendency, mean, mode, median.	5	10

	Dispersion range, variance, standard deviation Section 3: Concept of normal and abnormal		
6	Patient safety and transport Section 1: Electrical safety Section 2: Fire safety Section 3: Intra-hospital Patient transport	5	10

	Section 4: Inter-hospital Patient transport			
7	Principles of management Section 1: Basic principles of Management – functions, types, importance, 5 10 motivation etc. Section 2: Personnel management – staffing, orientation, disciplining, complaints etc Section 3: Financial management – short and long term			
8	Communication Role Definition Communication Classification of communication Purpose Major difficulties Barriers Characteristics – The seven Cs Communication at the work place Human needs and communication “Mind mapping” Information communication	5	5	

METHODS OF TEACHING

Lecture cum discussion
Demonstration
Practical work record

METHODS OF EVALUATION

Written Test
Record Book
Assignments
Oral Presentations

ADVANCED CRITICAL CARE – RELATED TO THE SPECIALITY

Advanced Respiratory Critical Care Technology

Branch I Placement
: III Year
Paper I Advanced Critical Care – Part I

Hours of instruction
Theory: 85 hours
Practical: 550 hours
Total: 635 hours

Course Description

This course is designed to assist students in developing expertise and in- depth understanding in the field of respiratory critical care technology. It will help students to develop advanced skills for nursing intervention in various respiratory medical and surgical conditions. It will enable the student to function as respiratory critical care specialist. It will further enable the student to function as educator, manager and researcher in the field of respiratory critical care technology.

Objectives

At the end of the course the students will be able to:

- Appreciate trends and issues related to respiratory critical care technology.
- Describe the epidemiology, etiology, psychophysiology and diagnostic assessment of respiratory conditions
- Participate in national health programs for health promotion, prevention and rehabilitation of patients with respiratory conditions
- Perform physical, psychosocial & spiritual assessment
- Assist in various diagnostic, therapeutic and surgical procedures
- Apply nursing process in providing comprehensive care to patients with respiratory conditions
- Demonstrate advance skills/competence in managing patients with cardio vascular conditions including Life Support measures.
- Describe the various drugs used in respiratory conditions and nurses responsibility
- Demonstrate skill in handling various equipments/gadgets used for critical care of respiratory patients
- Appreciate team work & coordinate activities related to patient care.
- Practice infection control measures.
- Identify emergencies and complications & take appropriate measures.
- Discuss the legal and ethical issues in respiratory critical care technology.
- Assist patients and their family to cope with emotional distress, grief, anxiety and spiritual needs.
- Appreciate the role of alternative system of medicine in care of patient
- Incorporate evidence based nursing practice and identify the areas of research in the field of respiratory critical care technology.
- Identify the sources of stress and manage burnout syndrome among health care providers.
- Teach and supervise nurses and allied health workers.
- Design a layout of ICCU and ICTU and develop standards for respiratory critical care technology practice.

Course Outline

Unit	Content	Hours
1	Introduction Historical development, trends and issues in the field of respiratory. Respiratory conditions – major health problem. Concepts, principles and perspectives Ethical and legal issues Evidence based nursing and its application in respiratory critical care technology (to be incorporated in all the units)	5
2	Epidemiology Risk factors: hereditary, psycho social factors, hypertension, smoking, obesity, diabetes mellitus etc Health promotion, disease prevention, Life style modification National health programs related to cardio vascular conditions Alternate system of medicine Complementary therapies	5
3	Review of anatomy and physiology of cardio vascular system Review of anatomy and physiology of respiratory system Embryology of lungs. Bio-chemistry of blood in relation to cardio pulmonary function.	5
4	Assessment and Diagnostic Measures: History taking Physical assessment Respiratory rate variability: Mechanisms , measurements, pattern, factors, impact of interventions on HRV Blood gases and its significance, oxygen supply and demand Radiologic examination of the chest: interpretation, chest film findings. Magnetic Resonance Imaging. Cardio electro physiology procedures: Diagnostic studies, interventional and catheter ablation, nursing care Exercise testing: indications and objectives, Cardiac catheterization: indications, contraindications, patient preparation, procedure, interpretation of data Pulmonary function test: Bronchoscopy and graphics Interpretation of diagnostic measures Role in diagnostic tests	20

	Laboratory tests using blood: Blood specimen collection Arterial blood gases, Blood Chemistries, cardiac enzyme studies, Serum Concentration of Selected drugs. Interpretation and role of nurse	
5	Care of a patient with obstructive airway Assessment Use of artificial airway Endotracheal intubation, tracheostomy and its care Complication, minimum cuff leak, securing tubes Oxygen delivery systems.	25

	Nasal Cannula Oxygen mask, Venturi mask Partial rebreathing bag Bi-PAP and C-PAP masks Uses, advantages, disadvantages, nursing implications of each. Mechanical Ventilation, Principles of mechanical ventilation, Types of mechanical ventilation and ventilators. Modes of ventilation, advantage, disadvantage, complications. PEEP therapy, indications, physiology, and complications. Weaning off the ventilator. Assessment and interventions of ventilated patient.	
6	Pharmacology Review Forms of drugs Pharmacokinetics Analgesics/Anti inflammatory agents Antibiotics, antiseptics Drug reaction & toxicity Drugs used in cardiac emergencies Blood and blood components Inotropic agents Beta-blocking agents Vaso constrictors Bronchodilators Broncho constrictors Mucolytic agents Immunotrophic agents Leukotriene agents Vaso dilators Sedatives and tranquilizers. Principles of drug administration, role and responsibilities in taking care of drugs	10
7	Intensive Coronary Care Unit/intensive cardio thoracic unit: Quality assurance Standards, Protocols, Policies, Procedures Infection control; Standard safety measures Nursing audit Design of ICCU/ICTU Staffing; cardiac team	15

	Burn out syndrome Role in the management of I.C.C.U and ICTU. Mobile coronary care unit. Planning in service educational programme and teaching	

Practical

Total – 1050 Hours
1 Weeks = 30 Hours

Dept/ Unit

1 Cardiac –Medical & Surgical

OTs (Cardiac and
thoracic) Casualty
Diagnostic labs including cath lab
ICCU
ICU
CCU
Pediatric Intensive
OPD

Total 35 Weeks 1050 Hours

Essential Nursing Skills
Procedures Observed

Echo cardiogram
Ultrasound
Monitoring JVP , CVP
CT SCAN
MRI
TMT X-
RAY
Pet SCAN
Angiography
Various Surgeries
Any other

Procedures Assisted

Arterial blood gas
analysis Thoracentesis
Lung biopsy
Computer assisted tomography (CAT Scan)
M.R.I.
Pulmonary angiography
Bronchoscopy
Pulmonary function test
ET tube insertion
Tracheostomy tube insertion
Treadmill test
Echo cardiography
Doppler ultrasound
Insertion of chest
tube CVP Monitoring
Measuring pulmonary artery pressure by Swan-Ganz Catheter

Procedures Performed

Preparation of assessment tool for CT client (Cardiac, thoracic and vascular).
ECG – Recording, Reading, Identification of abnormalities
Oxygen therapy – Cylinder, central supply, Catheter, nasal cannula, mask, tent Through
ET and Tracheostomy tube Manual resuscitation bag
Mechanical ventilation

Spirometer
- Tuberculin skin test
- Aerosol therapy
- Nebulizer therapy
- Water seal drainage

Chest physiotherapy including – Breathing Exercises Coughing Exercises Percussion & Vibration
- Suctioning – Oropharyngeal, nasotracheal, Endotracheal Through tracheostomy tube
- Artificial airway cuff maintenance

CPR

Care of client on ventilator
- Identification of different – Arrhythmias Abnormal pulses, respirations B.P. Variation Heart sounds Breath sounds

Pulse oxymetry
- Introduction of intracath
- Bolus I.V. Injection

Life line
- Maintenance of "Heplock"
- Subcutaneous of Heparin
- Obtaining leg measurements to detect early swelling in thrombophlebitis Identification of Homans signs

Buergen – Allen exercises

ADVANCED CRITICAL CARE – RELATED TO THE SPECIALITY

Advanced Respiratory Critical Care Technology

Branch I
Placement : III Year
Paper II Advanced Critical Care – Part II

Hours of instruction
Theory : 65 hours
Practical :600 hours
Total : 665 hours.

Course Description

This course is designed to assist students in developing expertise and in- depth understanding in the field of respiratory critical care technology. It will help students to develop advanced skills for nursing intervention in various respiratory medical and surgical conditions. It will enable the student to function as respiratory critical care specialist. It will further enable the student to function as educator, manager and researcher in the field of respiratory critical care technology.

Objectives

At the end of the course the students will be able to:

- Appreciate trends and issues related to respiratory critical care technology.
- Describe the epidemiology, etiology, psychophysiology and diagnostic assessment of respiratory conditions
- Participate in national health programs for health promotion, prevention and rehabilitation of patients with respiratory conditions
- Perform physical, psychosocial & spiritual assessment
- Assist in various diagnostic, therapeutic and surgical procedures
- Apply nursing process in providing comprehensive care to patients with respiratory conditions
- Demonstrate advance skills/competence in managing patients with cardio vascular conditions including Life Support measures.
- Describe the various drugs used in respiratory conditions and nurses responsibility
- Demonstrate skill in handling various equipments/gadgets used for critical care of respiratory patients
- Appreciate team work & coordinate activities related to patient care.
- Practice infection control measures.
- Identify emergencies and complications & take appropriate measures.
- Discuss the legal and ethical issues in respiratory critical care technology.
- Assist patients and their family to cope with emotional distress, grief, anxiety and spiritual needs.
- Appreciate the role of alternative system of medicine in care of patient
- Incorporate evidence based nursing practice and identify the areas of research in the field of respiratory critical care technology.
- Identify the sources of stress and manage burnout syndrome among health care providers.
- Teach and supervise nurses and allied health workers.
- Design a layout of ICCU and ICTU and develop standards for respiratory critical care technology practice.

Course Outline

UNIT	CONTENT	HOURS
1	**Altered pulmonary conditions** Etiology, clinical manifestations, diagnosis, prognosis, related pathophysiology, treatment modalities and management of: Bronchitis Bronchial asthma Bronchiectasis Pneumonias Lung abscess, lung tumour Pulmonary tuberculosis, fibrosis, pneumonias etc Pleuritis, effusion Pneumothorax, haemothorax and pyothorax Interstitial Lung Disease Cystic Fibrosis Acute and Chronic Obstructive Pulmonary Disease (conditions leading to) Cor pulmonale Acute Respiratory Failure Adult Respiratory Distress Syndrome Pulmonary Embolism Pulmonary Hypertension	**10**
2	**Vascular disorders management** Etiology, clinical manifestations, diagnosis, prognosis, related pathophysiology, treatment modalities and management of: Disorders of arteries Disorders of the aorta Aortic Aneurysms Aortic dissection Raynaud's phenomenon Peripheral arterial disease of the lower extremities Venous thrombosis Varicose veins Chronic venous insufficiency and venous leg ulcers Pulmonary embolism	**10**
3	**Respiratory emergency interventions** CPR- BLS and ALS Use of ventilator, defibrillator, pacemaker Post Resuscitation Care Care of the critically ill patients Psychosocial and spiritual aspects of care Stress management; ICU psychosis	**10**
4	**Congenital Diseases,**	**10**

	Etiology, clinical manifestations, diagnosis, prognosis, related pathophysiology, treatment modalities and management of: Embryological development of heart. Tracheo Oesophageal Fistula	

	Pulmonary atresia Hypoplastic lung Broncho Pulmonary Dysplasia	
5	**Care of patient undergoing respiratory surgery** Indications, selection of patient Preoperative assessment and preparation; counseling. Intraoperative care: Principles of surgery, equipment, anaesthesia, Thoracic surgery: lobectomy, pneumonectomy, tumour excision etc Immediate postoperative care : assessment, post operative problems and interventions Bleeding, Cardiac tamponade, Low cardiac output, Infarction, Pericardial effusion, Pleural effusion, Pneumothorax, Haemothorax, Coagulopathy, Thermal imbalance, Inadequate., ventilation/perfusion, Neurological problems, renal problems, Psychological problems. Chest physiotherapy Nursing interventions- life style modification, complementary therapy/alternative systems of medicine. Intermediate and late post operative care after CABG, valve surgery, others. Follow up care	**20**
6	**Respiratory rehabilitation** Process Physical evaluation Life style modification Physical conditioning for respiratory efficiency through exercise Counseling Follow up care	**5**
7	**Intensive Coronary Care Unit/intensive cardio thoracic unit**: Quality assurance Standards, Protocols, Policies, Procedures Infection control; Standard safety measures Nursing audit Design of ICCU/ICTU Staffing; cardiac team Burn out syndrome Role in the management of I.C.C.U and ICTU Mobile coronary care unit Planning in service educational programme and teaching	**15**
Practical		

Total – 1050 Hours 1
Weeks = 30 Hours

Dept/ Unit

1 Cardiac –Medical & Surgical
OTs (Cardiac and thoracic)
Casualty
Diagnostic labs including cath lab ICCU
ICU

CCU
Pediatric
Intensive OPD

Total 35 Weeks 1050 Hours

Essential Nursing Skills

Procedures Observed

Echo cardiogram
Ultrasound
Monitoring JVP ,
CVP CT SCAN
MRI
TMT X-
RAY Pet
SCAN
Angiography
Various Surgeries
Any other

Procedures Assisted

Arterial blood gas
analysis Thoracentesis
Lung biopsy
Computer assisted tomography (CAT Scan)
M.R.I.
Pulmonary angiography
Bronchoscopy
Pulmonary function
test ET tube insertion
Tracheostomy tube insertion
Treadmill test
Echo cardiography
Doppler ultrasound
Insertion of chest
tube CVP Monitoring
Measuring pulmonary artery pressure by Swan-Ganz Catheter

Procedures Performed

Preparation of assessment tool for CT client (Cardiac, thoracic and vascular).
ECG – Recording, Reading, Identification of abnormalities
Oxygen therapy – Cylinder, central supply, Catheter, nasal canula, mask, tent
Through ET and Tracheostomy tube Manual resuscitation bag
Mechanical ventilation
Spirometer
Tuberculin skin test

Aerosol therapy
- Nebulizer therapy
- Water seal drainage

Chest physiotherapy including – Breathing Exercises Coughing Exercises Percussion & Vibration

Suctioning – Oropharyngeal, nasotracheal, Endotrachieal Through tracheostomy tube
- Artificial airway cuff maintenance
- CPR

Care of client on ventilator

Identification of different – Arrhythmias Abnormal pulses, respirations B.P. Variation Heart sounds Breath sounds

Pulse oxymetry
- Introduction of intracath
- Bolus I.V. Injection

Life line

Maintenance of “Heplock”

Subcutaneous of Heparin

Obtaining leg measurements to detect early swelling in thrombophlebitis

Identification of Homans signs

Buergen – Allen exercises

ADVANCED CRITICAL CARE – RELATED TO THE SPECIALITY

Advanced Cardiac Critical Care Technology

Branch II
Placement : III year
Paper I Advanced Critical Care – Part I

Hours of Instruction
Theory : 85 hours
Practical :550 hours
Total : 635 hours

Course Description

This course is designed to assist students in developing expertise and in- depth understanding in the field of cardiac critical care technology. It will help students to develop advanced skills intervention in various cardiac medical and surgical conditions. It will enable the student to function as Cardiac critical care specialist. It will further enable the student to function as educator, manager and researcher in the field of cardiac critical care technology.

Objectives

At the end of the course the students will be able to:

- Appreciate trends and issues related to cardiac critical care technology.
- Describe the epidemiology, etiology, psychophysiology and diagnostic assessment of cardiac conditions
- Participate in national health programs for health promotion, prevention and rehabilitation of patients with cardiac conditions
- Perform physical, psychosocial & spiritual assessment
- Assist in various diagnostic, therapeutic and surgical procedures
- Apply nursing process in providing comprehensive care to patients with cardiac conditions
- Demonstrate advance skills/competence in managing patients with cardio vascular conditions including Advance Cardiac Life Support.
- Describe the various drugs used in cardiac conditions and nurses responsibility
- Demonstrate skill in handling various equipments/gadgets used for critical care of cardiac patients
- Appreciate team work & coordinate activities related to patient care.
- Practice infection control measures.
- Identify emergencies and complications & take appropriate measures.
- Discuss the legal and ethical issues in cardiac critical care technology.
- Assist patients and their family to cope with emotional distress, grief, anxiety and spiritual needs.
- Appreciate the role of alternative system of medicine in care of patient
- Incorporate evidence based nursing practice and identify the areas of research in the field of cardiac critical care technology.
- Identify the sources of stress and manage burnout syndrome among health care providers.
- Teach and supervise nurses and allied health workers.
- Design a layout of ICCU and ICTU and develop standards for cardiac critical care technology practice.

Course Outline

UNIT	CONTENT	HOURS
1	**Introduction** Historical development, trends and issues in the field of cardiology. Cardio vascular conditions – major health problem. Concepts, principles and nursing perspectives Ethical and legal issues Evidence based nursing and its application in cardiac critical care technology (to be incorporated in all the units)	5
2	**Epidemiology** Risk factors: hereditary, psycho social factors, hypertension, smoking, obesity, diabetes mellitus etc Health promotion, disease prevention, Life style modification National health programs related to cardio vascular conditions Alternate system of medicine Complementary therapies	5
3	**Review of anatomy and physiology of cardio vascular system** Review of anatomy and physiology of heart and blood vessels. Embryology of heart. Coronary circulation Hemodynamics and electro physiology of heart. Bio-chemistry of blood in relation to cardio pulmonary function	5
4	**Assessment and Diagnostic Measures**: History taking Physical assessment Heart rate variability: Mechanisms , measurements, pattern, factors, impact of interventions on HRV Diagnostic tests o Hemodynamic monitoring: Technical aspects, monitoring, functional hemodynamic indices, ventricular output measurements (Arterial and swan Ganz monitoring). ➢ Blood gases and its significance, oxygen supply and demand o Magnetic Resonance Imaging. o Cardio Electro Physiology procedures: Diagnostic studies, interventional and catheter ablation, nursing care ➢ Exercise testing: indications and objectives, ➢ Cardiac catheterization: indications, contraindications, patient preparation, procedure, interpretation of data ➢ Pulmonary function test: Bronchoscopy and graphics	20

- Interpretation of diagnostic measures
- Nurse's role in diagnostic tests

Laboratory tests using blood: Blood specimen collection, Cardiac markers, Blood lipids, Hematologic studies, Blood cultures, Coagulation studies, Arterial blood gases, Blood Chemistries, cardiac enzyme studies, Serum Concentration of Selected drugs.

	Interpretation and findings	
5	**Pharmacology** Review Pharmacokinetics Analgesics/Anti inflammatory agents Antibiotics, antiseptics Drug reaction & toxicity Drugs used in cardiac emergencies Blood and blood components Antithrombolytic agents Inotropic agents Beta-blocking agents Calcium channel blockers. Vaso constrictors Vaso dilators ACE inhibitors. Anticoagulants Anti arrhythmic drugs. Anti hypertensives Diuretics Sedatives and tranquilizers. Digitalis Antilipemics Principles of drug administration and care to be taken in drug administration.	**10**
6	**Care of patient undergoing cardiac surgery** Indications, selection of patient Preoperative assessment and preparation; counseling. Intraoperative care: Principles of open heart surgery, equipment, anaesthesia, cardiopulmonary bypass Surgical procedures for Coronary Artery Bypass Grafting, recent advances and types of grafts, Valve replacement or reconstruction, cardiac transplant, Palliative surgery and different Stents, vascular surgery, other recent advances. Immediate postoperative care : assessment, post operative problems and interventions	**20**

	Bleeding, Cardiac tamponade, Low cardiac output, Infarction, Pericardial effusion,Pleural effusion, Pneumothorax, Haemothorax, Coagulopathy, Thermal imbalance, Inadequate., ventilation/perfusion, Neurological problems, renal problems, Psychological problems. Chest physiotherapy Life style modification, complementary therapy/alternative systems of medicine. Intermediate and late post operative care after CABG, valve surgery, others. Follow up care	
7	**Cardiac rehabilitation**	**5**

	Process Physical evaluation Life style modification Physical conditioning for cardiovascular efficiency through exercise Counseling Follow up care	
8	**Intensive Coronary Care Unit/intensive cardio thoracic unit**: Quality assurance Standards, Protocols, Policies, Procedures Infection control; Standard safety measures Nursing audit Design of ICCU/ICTU Staffing; cardiac team Burn out syndrome Role in the management of I.C.C.U and ICTU. Mobile coronary care unit. Planning in service educational programme and teaching	**15**

Practicals

Total – 1050 Hours
1 Weeks = 30 Hours

Dept/ Unit

Cardiac –Medical & Surgical
OTs (Cardiac and thoracic) Casualty
Diagnostic labs including cath lab ICCU
ICU
CCU
Pediatric
Intensive OPD

Total 35 Weeks 1050 Hours

Essential Nursing Skills
Procedures Observed

Echo cardiogram
Ultrasound
Monitoring JVP, CVP
CT SCAN
MRI
Pet scan
Angiography

Cardiac catheterization
Angioplasty
Various Surgeries
Any other

Procedures Assisted

Arterial blood gas analysis Thoracentesis
Lung biopsy
Computer Assisted Tomography (CAT scan) M.R.I
Pulmonary angiography
Bronchoscopy
Pulmonary function test ET tube insertion
Tracheostomy tube insertion
Cardiac catheterization
Angiogram
Defibrillation
Treadmill test
Echo cardiography
Doppler ultrasound
Cardiac surgery
Insertion of chest tube CVP Monitoring
Measuring pulmonary artery pressure by Swan-Ganz Catheter
Cardiac Pacing

Procedures Performed

Preparation of assessment tool for CT client (Cardiac, thoracic and vascular) ECG – Recording, Reading, Identification of abnormalities
Oxygen therapy – Cylinder, central supply, Catheter, nasal cannula, mask, tent Through ET and Tracheostomy tube Manual resuscitation bag Mechanical ventilation Spirometer
Tuberculin skin test
Aerosol therapy
Nebulizer therapy
Water seal drainage
Chest physiotherapy including – Breathing Exercises Coughing Exercises Percussion & Vibration
Suctioning – Oropharyngeal, nasotracheal, Endotracheal Through tracheostomy tube
Artificial airway cuff maintenance
CPR
Care of client on ventilator
Identification of different – Arrhythmias Abnormal pulses, respirations B.P. Variation Heart sounds Breath sounds

Pulse oxymetry
- Introduction of intracath
- Bolus I.V. Injection

Life line
- Maintenance of “Heplock”
- Subcutaneous of Heparin

Obtaining leg measurements to detect early swelling in thrombophlebitis

Identification of Humans signs

Buergen – Allen exercises

ADVANCED CRITICAL CARE – RELATED TO THE SPECIALITY

Advanced Cardiac Critical Care Technology

Branch II
Placement : III year
Paper II Advanced Critical Care – Part II

Hours of Instruction
Theory : 65 hours
Practical :500 hours
Total : 565 hours

Course Description

This course is designed to assist students in developing expertise and in- depth understanding in the field of cardiac critical care technology. It will help students to develop advanced skills intervention in various cardiac medical and surgical conditions. It will enable the student to function as Cardiac critical care specialist. It will further enable the student to function as educator, manager and researcher in the field of cardiac critical care technology.

Objectives

At the end of the course the students will be able to:

- Appreciate trends and issues related to cardiac critical care technology.
- Describe the epidemiology, etiology, psychophysiology and diagnostic assessment of cardiac conditions
- Participate in national health programs for health promotion, prevention and rehabilitation of patients with cardiac conditions
- Perform physical, psychosocial & spiritual assessment
- Assist in various diagnostic, therapeutic and surgical procedures
- Apply nursing process in providing comprehensive care to patients with cardiac conditions
- Demonstrate advance skills/competence in managing patients with cardio vascular conditions including Advance Cardiac Life Support.
- Describe the various drugs used in cardiac conditions and nurses responsibility
- Demonstrate skill in handling various equipments/gadgets used for critical care of cardiac patients
- Appreciate team work & coordinate activities related to patient care.
- Practice infection control measures.
- Identify emergencies and complications & take appropriate measures.
- Discuss the legal and ethical issues in cardiac critical care technology.
- Assist patients and their family to cope with emotional distress, grief, anxiety and spiritual needs.
- Appreciate the role of alternative system of medicine in care of patient
- Incorporate evidence based nursing practice and identify the areas of research in the field of cardiac critical care technology.
- Identify the sources of stress and manage burnout syndrome among health care providers.
- Teach and supervise nurses and allied health workers.
- Design a layout of ICCU and ICTU and develop standards for cardiac critical care technology practice.

Course Outline

UNIT	CONTENT	HOURS
1	**Cardiac disorders management**: Etiology, clinical manifestations, diagnosis, prognosis, related pathophysiology, treatment modalities and management of: Hypertension Coronary Artery Disease. Angina of various types. Cardiomegaly Myocardial Infarction, Congestive cardiac failure Heart Failure, Pulmonary Edema, Shock. Rheumatic heart disease and other Valvular Diseases Inflammatory Heart Diseases, Infective Endocarditis, Myocarditis, Pericarditis. Cardiomyopathy, dilated, restrictive, hypertrophic. Arrhythmias, heart block Associated illnesses	25
2	**Altered pulmonary conditions** Etiology, clinical manifestations, diagnosis, prognosis, related pathophysiology, treatment modalities and management of: Bronchitis Bronchial asthma Bronchiectasis Pneumonias Lung abscess, lung tumour Pulmonary tuberculosis, fibrosis, pneumonias etc Pleuritis, effusion Pneumothorax, haemothorax and pyothorax Interstitial Lung Disease Cystic fibrosis Acute and Chronic obstructive pulmonary disease (conditions leading to) Cor pulmonale Acute respiratory failure Adult respiratory distress syndrome Pulmonary embolism	**10**

	Pulmonary Hypertension	

3	**Vascular disorders management** Etiology, clinical manifestations, diagnosis, prognosis, related pathophysiology, treatment modalities and management of: Disorders of arteries Disorders of the aorta Aortic Aneurysms, Aortic dissection Raynaud's phenomenon Peripheral arterial disease of the lower extremities Venous thrombosis Varicose veins Chronic venous insufficiency and venous leg ulcers Pulmonary embolism	**10**
4	**Cardiac emergency interventions** CPR- BLS and ALS Use of ventilator, defibrillator , pacemaker Post resuscitation care. Care of the critically ill patients Psychosocial and spiritual aspects of care Stress management; ICU psychosis	**10**
5	**Congenital Heart Diseases,** Etiology, clinical manifestations, diagnosis, prognosis, related pathophysiology, treatment modalities and management of: Embryo logical development of heart. Classification – cyanotic and acyanotic heart disease. Tetralogy of Fallot. Atrial Septal Defect, Ventricular Septal Defect., Eisenmenger's complex. Patent ductus arteriosus, AP window Truncus Arteriosus. Transposition of great arteries. Total Anomaly of Pulmonary Venous Connection. Pulmonary stenosis, atresia. Coarctation of aorta. Ebstein's anomaly Double outlet right ventricle, Single ventricle, Hypo-plastic left heart	**10**

syndrome.

Practicals

Total – 1050 Hours

1 Weeks = 30 Hours

Dept/ Unit

Cardiac –Medical & Surgical

OTs (Cardiac and thoracic)

Casualty

Diagnostic labs including cath lab
ICCU
ICU
CCU
Pediatric
Intensive OPD

Total 35 Weeks 1050 Hours

Essential Nursing Skills

Procedures Observed

Echo cardiogram
Ultrasound
Monitoring JVP, CVP
CT SCAN
MRI
Pet scan
Angiography
Cardiac catheterization
Angioplasty
Various Surgeries
Any other

Procedures Assisted

Arterial blood gas analysis
Thoracentesis
Lung biopsy
Computer assisted tomography (CAT scan)
M.R.I
Pulmonary angiography
Bronchoscopy
Pulmonary function
test ET tube insertion
Tracheostomy tube insertion
Cardiac catheterization
Angiogram
Defibrillation
Treadmill test
Echo cardiography
Doppler ultrasound
Cardiac surgery
Insertion of chest
tube CVP Monitoring
Measuring pulmonary artery pressure by Swan-Ganz Catheter
Cardiac Pacing

Procedures Performed

Preparation of assessment tool for CT client (Cardiac, thoracic and vascular)
ECG – Recording, Reading, Identification of abnormalities
Oxygen therapy – Cylinder, central supply, Catheter, nasal cannula, mask, tent Through ET and Tracheostomy tube Manual resuscitation bag
Mechanical ventilation
Spirometer
Tuberculin skin test
Aerosol therapy
Nebulizer therapy
Water seal drainage
Chest physiotherapy including – Breathing Exercises Coughing Exercises Percussion & Vibration
Suctioning – Oropharyngeal, nasotracheal, Endotracheal Through tracheostomy tube
Artificial airway cuff maintenance
CPR
Care of client on ventilator
Identification of different – Arrhythmias Abnormal pulses, respirations B.P. Variation Heart sounds Breath sounds
Pulse oxymetry
Introduction of intracath
Bolus I.V. Injection
Life line
Maintenance of “Heplock”
Subcutaneous of Heparin
Obtaining leg measurements to detect early swelling in thrombophlebitis
Identification of Homans signs
Buergen – Allen exercises

ADVANCED CRITICAL CARE – RELATED TO THE SPECIALITY

Advanced Nephro Critical Care Technology

Branch III
Placement : III year
Paper I Advanced Critical Care – Part I

Hours of Instruction
Theory : 60 hours
Practical :550 hours
Total : 610 hours

Course Description

This course is designed to assist students in developing expertise and in- depth understanding in the field of nephro critical care technology. It will help students to develop advanced skills for nursing intervention in various nephro conditions. It will enable the student to function as nephro critical care specialist and provide quality care. It will further enable the student to function as educator, manager, and researcher in the field of nephro critical care technology.

Objectives

At the end of the course the students will be able to:

- Appreciate trends and issues related to nephro critical care technology
- Describe the epidemiology, etiology, pathophysiology and diagnostic assessment of nephro conditions
- Perform physical, psychosocial & spiritual assessment
- Assist in various diagnostic, therapeutic and surgical interventions
- Provide comprehensive nursing care to patients with nephro conditions
- Describe the various drugs used in nephro conditions and nurses responsibility
- Demonstrate skill in handling various equipments/gadgets used for patients with nephro conditions
- Appreciate team work & coordinate activities related to patient care.
- Practice infection control measures.
- Identify emergencies and complications & take appropriate measures
- Assist patients and their family to cope with emotional distress, grief, anxiety and spiritual needs.
- Discuss the legal and ethical issues in nephro critical care technology
- Identify the sources of stress and manage burnout syndrome among health care providers
- Appreciate the role of alternative system of medicine in the care of patient
- Incorporate evidence based nursing practice and identify the areas of research in the field of nephro critical care technology.
- Teach and supervise nurses and allied health workers.
- Design a layout of kidney transplant unit and dialysis unit
- Developstandardsofnephrocriticalcarenursingpractice

Course Outline

UNIT	CONTENT	HOURS
1	**Introduction** Historical development: trends and issues in the field of nephro critical care nursing , nephro and urological problems Concepts, principles and nursing perspectives Ethical and legal issues Evidence based nursing and its application in nephro and urological nursing(to be incorporated in all the units)	5
2	**Epidemiology** Major health problems- urinary dysfunction, urinary tract infections, Glomuerular disorders, obstructive disorders and other urinary disorders Risk factors associated with nephro and urological conditions conditions- Hereditary, Psychosocial factors, smoking, alcoholism, dietary habits, cultural and ethnic considerations Health promotion, disease prevention, life style modification and its implications to nursing Alternate system of medicine/complementary therapies	15
3	**Review of anatomy and physiology of urinary system** Embryology Structure and functions Renal circulation Physiology of urine formation Fluid and electrolyte balance Acid base balance Immunology specific to kidney	5
4	**Assessment and diagnostic measures** History taking Physical assessment, psychosocial assessment Common assessment abnormalities-dysurea, frequency, enuresis, urgency, hesistancy, hematuria, pain, retention, burning on urination, pneumaturia, incontinence, nocturia, polyurea, anuria, oliguria. Diagnostic tests-urine studies, blood chemistry, radiological procedures-KUB, IVP,nephrotomogram, retrograde pylogram, renal arteriogram, renal ultrasound, CT scan, MRI, cystogram, renal scan, biopsy, endoscopy-cystoscopy, urodynamics studies - cystometrogram, urinary flow study - sphincter electromyography, voiding pressure flow study- videourodynamics, Whitaker study - Interpretation of diagnostic measures	20

	Nurse’s role in diagnostic tests	
5	**Renal immunopathy/ Immunopathology** General Concept of immunopathology Immune mechanism of glomerual vascular disease Role of mediater systems in glomerula vascular disease	5
6	**Critical care units- dialysis , KTP unit** Philosophy, aims and objectives Policies, staffing pattern, design and physical plan of Dialysis and KTP units	10

		Team approach, functions Psychosocial aspects in relation to staff and clients of ICU, dialysis unit In-service education Ethical and legal issues	

Practicals
Total = 1050 Hours
1 Week = 30 Hours

Dept./ Unit
- Nephrology
- Ward Pediatrics
- Critical Care Unit
- Urology Ward
- Dialysis Unit
- Kidney Transplantation
- URO OT
- Emergency Wards
- Uro Nephro OPDs
- Diagnostic Labs

Total 35 Weeks 1050 Hours

Procedures Observed
- CT Scan
- MRI
- Radiographic studies Urodynamics
- Hemodialysis
- Renal Surgeries

Procedures Assisted
- Blood transfusion
- IV cannulation therapy
- Arterial Catheterization
- Insertion of central line/cvp line
- Connecting lines for dialysis
- Peritoneal dialysis
- Renal biopsy
- Endoscopies- Bladder, urethra

Procedure Performed
- Health assessment
- Insertion of urethral and supra pubic catheters
- Urine analysis
- Catheterization
- Peritoneal dialysis
- Bladder irrigation

Care of ostomies

Care of urinary drainage

Bladder training

Care of vascular access

Setting up dialysis machine and starting, monitoring and closing dialysis

Procedures for prevention of infections:

Hand washing, disinfection & sterilization surveillance, and fumigation universal precautions.

Collection of specimen

Administration of drugs: IM, IV injection, IV cannulation & fixation of infusion pump, calculation of dosages, blood administration. monitoring -fluid therapy, electrolyte imbalance.

Nutritional needs , diet therapy & patient

education. Counseling

Field/ Observational visit : 10

ADVANCED CRITICAL CARE – RELATED TO THE SPECIALITY

Advanced Nephro Critical Care Technology

Branch III
Placement : III year
Paper II Advanced Critical Care – Part II

Hours of Instruction
Theory : 90 hours
Practical :500 hours
Total : 590 hours

Course Description

This course is designed to assist students in developing expertise and in- depth understanding in the field of nephro critical care technology. It will help students to develop advanced skills for nursing intervention in various nephro conditions. It will enable the student to function as nephro critical care specialist and provide quality care. It will further enable the student to function as educator, manager, and researcher in the field of nephro critical care technology.

Objectives

At the end of the course the students will be able to:

- Appreciate trends and issues related to nephro critical care technology
- Describe the epidemiology, etiology, pathophysiology and diagnostic assessment of nephro conditions
- Perform physical, psychosocial & spiritual assessment
- Assist in various diagnostic, therapeutic and surgical interventions
- Provide comprehensive nursing care to patients with nephro conditions
- Describe the various drugs used in nephro conditions and nurses responsibility
- Demonstrate skill in handling various equipments/gadgets used for patients with nephro conditions
- Appreciate team work & coordinate activities related to patient care.
- Practice infection control measures.
- Identify emergencies and complications & take appropriate measures
- Assist patients and their family to cope with emotional distress, grief, anxiety and spiritual needs.
- Discuss the legal and ethical issues in nephro critical care technology
- Identify the sources of stress and manage burnout syndrome among health care providers
- Appreciate the role of alternative system of medicine in the care of patient
- Incorporate evidence based nursing practice and identify the areas of research in the field of nephro critical care technology.
- Teach and supervise nurses and allied health workers.
- Design a layout of kidney transplant unit and dialysis unit
- Developstandardsofnephrocriticalcarenursingpractice

Course Outline

UNIT	CONTENT	HOURS
1	**Urological Disorders Management** Etiology, clinical manifestations, diagnosis, prognosis, related pathophysiology, medical , surgical management of Urinary tract infections- pyelonephritis, lower urinary Disorders for ureters, bladder and urethera Urinary tract infections- Urinary dysfunctions- urinary retention, urinary incontinence, urinary reflux Bladder disorders- neoplasms, calculi, neurogenic bladder, trama, congenital abnormalities. Benign prostrate hypertrophy(BPH) Ureteral disorders: ureteritis, ureteral trauma, congenital anomalies of ureters Uretheral disorders- tumours, trauma, congenial anomalies of ureters.	15
2	**Glomerular disorders management** Etiology, clinical manifestations, diagnosis, prognosis, related pathophysiology, medical , surgical management of Glomueralo nephritis- chronic, acute , nephritic syndrome Acute Renal failure and chronic renal failure. Renal calculi Renal tumours-benign and malignant Renal trauma Renal abscess Diabetic nephropathy Vascular disorders Renal tuberculosis Polycystic Congenital disorders Hereditary renal disorders	25
3	**Management of Renal emergencies** Anuria Acute Renal failure Poisoning Trauma Urine retention Acute graft rejection Hematuria	10
4	**Dialysis**	10

	Dialysis- Historical, types, Principles, goals • Hemodialysis- vascular access sites- temporary and permanent • Peritoneal dialysis Dialsyis Procedures- steps, equipments, maintenance, Role of nurse- pre dialysis, intra and post dialysis Complications- Counseling patient education Records and reports	

5	**Kidney transplantation** Management of a patient with Kidney transplantation Kidney transplantations- a historical review Immunology of graft rejections The recipient of a renal transplant Renal preservations Human Leucocytic Antigen(HLA) typing matching and cross matching in renal transplantation Surgical techniques of renal transplantations Chronic renal transplant rejection Complication after KTP: Vascular and lymphatic, Uroloical, cardiovascular, liver and neurological, infectious complication KTP in children and management of pediatric patient with KTP KTP in developing countries Results of KTP Work up of donor and recipient for renal transplant Psychological aspect of KTP and organ donations Ethics in transplants Cadaveric transplantation	10
6	**Rehabilitation of patient with nephrological problems** Risk factors and prevention Rehabilitation of patients on dialysis and after kidney transplant Rehabilitation of patients after urinary diversions Family and patient teaching	5
7	**Pediatric urinary disorders** Etiology, clinical manifestations, diagnosis, prognosis, of children with Renal Diseases -UTI, ureteral reflux, glomerulo Nephritis, nephrotic syndrome infantile nephrosis, cystic kidneys, familial factors in renal diseases in childhood, Haemolytic uraemic Syndrome Benign recurrent haemturia, nephropathy, tumour	10
8	**Quality assurance in nephrological practice** Role of advance practioner in nephrological nursing Professional practice standards Quality control in nephrological nursing Nursing audit	5

Practicals

Total = 1050 Hours
1 Week = 30 Hours

Dept. / Unit

Nephrology

Ward Pediatrics

Critical Care Unit

Urology Ward

Dialysis Unit

Kidney Transplantation

URO OT
Emergency Wards
Uro Nephro OPDs
Diagnostic Labs

Total 35 Weeks 1050 Hours

Procedures Observed

CT Scan
MRI
Radiographic
studies Urodynamics
Hemodialysis
Renal Surgeries

Procedures Assisted

Blood transfusion
IV cannulation therapy
Arterial Catheterization
Insertion of central line/CVP line
Connecting lines for dialysis
Peritoneal dialysis
Renal biopsy
Endoscopies- Bladder, urethra

Procedure Performed

Health assessment
Insertion of urethral and supra pubic catheters
Urine analysis
Catheterization
Peritoneal dialysis
Bladder irrigation
Care of ostomies
Care of urinary drainage
Bladder training
Care of vascular access
Setting up dialysis machine and starting, monitoring and closing dialysis
Procedures for prevention of infections:
Hand washing, disinfection & sterilization surveillance, and fumigation universal precautions.
Collection of specimen.
Administration of drugs: IM, IV injection, IV cannulation & fixation of infusion pump, calculation of dosages, blood administration. Monitoring -fluid therapy, electrolyte imbalance.
Nutritional needs diet therapy & patient education.
Counseling

Field/ Observational visit: 10

ADVANCED CRITICAL CARE – RELATED TO THE SPECIALITY

Advanced Neuro Critical Care Technology

Branch IV
Placement : III year
Paper I Advanced Critical Care – Part I

Hours of Instruction
Theory : 50 hours
Practical :550 hours
Total : 600 hours

Course Description

This course is designed to assist students in developing expertise and in- depth knowledge in the field of neurology and neurosurgical Nursing. It will help students to develop advanced skills for nursing intervention in caring for patients with neurological and neurosurgical disorders. It will enable the student to function as neuroscience nurse practitioner/ specialist. It will further enable the student to function as educator, manager and researcher in the field of neurology and neurosurgical Nursing.

Objectives

At the end of the course the students will be able to

Appreciate trends and issues related to neurology and neurosurgical Nursing.
Review the anatomy and physiology of nervous system
Describe the epidemiology, etiology, pathophysiology and diagnostic assessment of patients with neurological and neurosurgical disorders
Perform neurological assessment and assist in diagnostic procedures
Describe the concepts and principles of neuroscience nursing
Describe the various drugs used in neurosciences and nurses responsibility
Assist in various therapeutic and surgical procedures in neuroscience nursing
Demonstrate advance skills/competence in managing patients with neurological and neurosurgical disorder following nursing process approach
Identify psychosocial problems of patients with disabilities and assist patients and their family to cope with emotional distress, spiritual, grief and anxiety
Participate in preventive, promotive and rehabilitative services for neurological and neurosurgical patients.
Explain the legal and ethical issues related to brain death, organ transplantation and practice of neuroscience nursing
Incorporate evidence based nursing practice and identify the areas of research in the field of neuroscience nursing
Organize and conduct in-service education program for nursing personnel.
Develop standards of care for quality assurance in neuroscience nursing practice
Identify the sources of stress and manage burnout syndrome among health care providers. Teach and supervise nurses and allied health workers.
Plan and develop physical layout ofneuro intensive care unit

Course Outline

UNIT	CONTENT	HOURS
1	**Introduction** Introduction to neuroscience(neurological and neurosurgical) History-Development in neurological and neurosurgical, Service & education Emerging trends and issues in neurology and neuro surgery and its implication to critical care practice. neurological and neurosurgical problems Concepts, principles and perspectives Ethical and legal issues Evidence based practice and its application in neurological and neurosurgical practice	5
2	**Epidemiology** Major health problems- Risk factors associated with neurological conditions- Hereditary, Psychosocial factors, smoking, alcoholism, dietary habits, cultural and ethnic considerations, occupational and infections. Health promotion, disease prevention, life style modification Alternate system of medicine/complementary therapies	5
3	**Review of Anatomy and Physiology** Embryology Structure and functions of Nervous system- CNS, ANS, Cereberal Circulation , Cranial and Spinal Nerves and Reflexes, Motor and Sensory Functions Sensory organs	10
4	**Assessment and diagnostic measures** Assessment History taking Physical assessment, psychosocial assessment Neurological assessments, Glasgow coma scale interpretation & its relevance Common assessment abnormalities **Diagnostic measures** Cerebro spinal fluid analysis • Radiological studies-Skull and Spine X-ray, Cerebral Angiography, CT Scan, Single Photon Emission Computer Tomography(SPECT), MRI (Magnetic Resonance Imaging), MRA, MRS, Functional MRI, Myelography, PET(Positron Emission Test), Interventional radiology.	15

- Electrographic studies- Electro Encephalography, MEG, EMG, video EEG,
- Nerve conduction studies-Evoked potentials, visual evoked potentials,
- Ultrasound studies -Carotid duplex, transcranial Doppler sonography,

	• Immunological studies • Biopsies – muscle, nerve and Brain.	
5	**Meeting Nutritional needs of neurological patients** Basic nutritional requirements Metabolic changes following injury and starvation Nutritional assessment Common neurological problems that interfere with nutrition and strategies for meeting their nutritional needs Special metabolic and electrolyte imbalances Chronic fatigue syndrome	5
6	**Drugs used in neurological and neurosurgical disorders** Classification Indications, contraindications, actions and effects, toxic effects	5
7	**Ethical and legal issues in neuroscience** Brain death and organ transplantation Euthanasia Negligence and malpractice Nosocomial infections	5

Practical

Total = 1050 Hours
1 Week = 30 Hours

Area of Posting

O.P.D.
Casualty
Diagnostics
Neuro psychiatry
Neuro Medical wards
Paediatric Neuro ward
Neuro surgical wards
Head Injury ward
ICU- neuro medicine
I.C.U.- neuro surgical
Rehabilitation
Operation Theatre

Total 35 Weeks 1050 Hours

Procedures Observed

CT scan
MRI
PET
EEG

EMG
Sleep pattern studies/Therapy
Radiographical studies

Neuro surgeries
Nerve conduction studies
Ultrasound studies
Any other

Procedures Assisted

Advanced Cardiac life support
Lumbar Puncture
Biopsies – muscle, nerve and Brain
Arterial Blood Gas
ECG Recording
Blood transfusion
IV cannulation – open method
Endotracheal intubation
Ventilation
Tracheostomy
ICP monitoring
Gama Knife
Cereberal angiography
Myelography
Neuro surgeries

Procedures Performed:

Airway management
Application of OroPharyngeal
Airway Care of Tracheostomy
Conduct Endotracheal Intubation
use of AMBU bag, artificial respirators
Setting of Ventilators and Care of patients on ventilators
Cardio Pulmonary Resuscitation -Defibrillation
Neurological assessment -Glasgow coma
scale Gastric Lavage
IV Cannulation
Administration of emergency IV Drugs, fluid
Care of patients with incontinence, bladder training Catheterization
Care of patients on traction related to the neurological conditions
Blood Administration.
Muscle strengthening exercises
Guidance and counseling
Monitoring – management and care of monitors.

ADVANCED CRITICAL CARE – RELATED TO THE SPECIALITY

Advanced Neuro Critical Care Technology

Branch IV
Placement : III year
Paper II Advanced Critical Care – Part II

Hours of Instruction
Theory : 100 hours
Practical :500 hours
Total : 600 hours

Course Description

This course is designed to assist students in developing expertise and in- depth knowledge in the field of neurology and neurosurgical Nursing. It will help students to develop advanced skills for nursing intervention in caring for patients with neurological and neurosurgical disorders. It will enable the student to function as neuroscience nurse practitioner/ specialist. It will further enable the student to function as educator, manager and researcher in the field of neurology and neurosurgical Nursing.

Objectives

At the end of the course the students will be able to

- Appreciate trends and issues related to neurology and neurosurgical Nursing.
- Review the anatomy and physiology of nervous system
- Describe the epidemiology, etiology, pathophysiology and diagnostic assessment of patients with neurological and neurosurgical disorders
- Perform neurological assessment and assist in diagnostic procedures
- Describe the concepts and principles of neuroscience nursing
- Describe the various drugs used in neurosciences and nurses responsibility
- Assist in various therapeutic and surgical procedures in neuroscience nursing
- Demonstrate advance skills/competence in managing patients with neurological and neurosurgical disorder following nursing process approach
- Identify psychosocial problems of patients with disabilities and assist patients and their family to cope with emotional distress, spiritual, grief and anxiety
- Participate in preventive, promotive and rehabilitative services for neurological and neurosurgical patients.
- Explain the legal and ethical issues related to brain death, organ transplantation and practice of neuroscience nursing
- Incorporate evidence based nursing practice and identify the areas of research in the field of neuroscience nursing
- Organize and conduct in-service education program for nursing personnel.
- Develop standards of care for quality assurance in neuroscience nursing practice
- Identify the sources of stress and manage burnout syndrome among health care providers. Teach and supervise nurses and allied health workers.
- Plan and develop physical layout of neuro intensive care unit

Course Outline

UNIT	CONTENT	HOURS
1	**Traumatic conditions**. Causes, pathophysiology, Clinical types, Clinical features, diagnosis, Prognosis, Management: medical, surgical management of Cranio cerebral injuries. Spinal & Spinal cord injuries. Peripheral nerve injuries. Unconsciousness	10
2	**Cerebro vascular disorders**. pathophysiology, Clinical types, Clinical features, diagnosis, Prognosis , Management: medical, surgical management of Stroke & Arterio Venous Thrombosis Haemorrhagic embolus Cerebro vascular accidents Intracranial aneurysm Subarachnoid Haemorrhage Arterio Venous Fistula Brain Tumors Diseases of cranial nerves; Trigeminal neuralgia, Facial palsy, Bulbar palsy	10
3	**Degenerating and desalinating disorders** Causes, pathophysiology, Clinical types, Clinical features, diagnostic, Prognosis, Management: medical, surgical management of Motor neuron diseases. Movement disorders- Tics, dystopia, chorea, Wilson's disease, Essential tremors Dementia Parkinson's disease Multiple sclerosis Alzheimer's	10
4	**Neuro infections** Causes, pathophysiology, Clinical types, Clinical features, diagnostic, Prognosis, Management: medical, surgical management of Neuro infections Meningitis-types Encephalitis Poliomyelitis	10

	Parasitic infections Bacterial infections Neurosyphilis HIV & AIDS Brain abscess	
5	**Paroxysmal disorders.** Causes, pathophysiology, Clinical types, Clinical features, diagnosis, Prognosis ,Management: medical, surgical and management of	10

	Epilepsy and seizures Status epilepticus Syncope Menier's syndrome Cephalgia	
6	**Developmental disorders.** Causes, pathophysiology, Clinical types, Clinical features, diagnostic, Prognosis Management: medical, surgical management of Hydrocephalus. Craniosynostosis. spina bifida- Meningocele, Meningomyelocele encephalocele syringomyelia. Cerebro vascular system anomalies. Cerebral palsies. Down's syndrome	10
7	**Neuro muscular disorders**. Causes, pathophysiology, Clinical types, Clinical features, diagnostic, Prognosis, Management: medical, surgical management of Polyneuritis – G B Syndrome Muscular dystrophy. Myasthenia gravis. Trigeminal neuralgia. Bell's palsy. Menier's disease Carpal tunnel syndrome Peripheral neuropathies	10
8	**Neoplasms – surgical conditions**. Causes, pathophysiology, Clinical types, Clinical features, diagnostic, Prognosis , management of Space occupying lesions -types Common tumors of CNS,	5
9	**Other disorders** Causes, pathophysiology, Clinical types, Clinical features, diagnostic, Prognosis, Management: medical, surgical management of Metabolic disorders- diabetes, insipidus, metabolic encephalopathy Sleep disorders Auto immune disorders – multiple sclerosis inflammatory myopathies	5
10	**Neuro emergencies**	10

	Causes, pathophysiology, Clinical types, Clinical features, diagnostic, Prognosis, Management: medical, surgical management of Increased intra cranial pressure Unconscious Herniation syndrome Seizures Severe head injuries Spinal injuries Cerebro vascular accidents	

11	**Rehabilitation**. Concept and Principles of Rehabilitation. Factors affecting quality of life and coping Rehabilitation in acute care setting, and following stroke, head injury and degenerative disorders of brain Physiotherapy. Counselling Care giver's role Speech & Language. - Neurogenic communication disorders, Speech therapy	5
12	**Quality Care in Neuroscience** Quality assurance in neurological practice Role of advance practitioner in neurological condition Quality control in neurologic problems Nursing audit **Neuro ICU** Philosophy, aims and objectives Policies, staffing pattern, design and physical plan of neuro ICU Team approach, functions Psychosocial aspects in relation to staff and clients of neuro ICU, In-service education	5

Practical

Total = 1050 Hours
1 Week = 30 Hours

Area of Posting

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Neuro surgical wards
Head Injury ward
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Procedures Observed

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MRI

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EMG

Sleep pattern studies/Therapy

- Radiographical studies
- Neuro surgeries
- Nerve conduction studies
- Ultrasound studies

Any other

Procedures Assisted

- Advanced Cardiac life support
- Lumbar Puncture
- Biopsies – muscle, nerve and Brain
- Arterial Blood Gas
- ECG Recording
- Blood transfusion
- IV cannulation – open method
- Endotracheal intubation
- Ventilation
- Tracheostomy
- ICP monitoring
- Gama Knife
- Cereberal angiography
- Myelography

Neuro surgeries

Procedures Performed:

Airway management

- Application of Oropharyngeal Airway
- Care of Tracheostomy

Conduct Endotracheal Intubation

use of AMBU bag, artificial respirators

- Setting of Ventilators and Care of patients on ventilators
- Cardio Pulmonary Resuscitation -Defibrillation
- Neurological assessment -Glasgow coma scale Gastric Lavage

IV Cannulation

Administration of emergency IV Drugs, fluid

Care of patients with incontinence, bladder training Catheterization

- Care of patients on traction related to the neurological conditions
- Blood Administration.
- Muscle strengthening exercises
- Guidance and counseling

Monitoring – management and care of monitors.

SCHEME OF EXAMINATION

FIRST YEAR

SUBJECTS	THEORY				
	Hours	**Internal**	**University**	**Internal**	**University**
Paper 1: Applied Anatomy & Physiology related to critical care	3	50	100	-	-
Paper 2: Applied biochemistry and pharmacology related to critical care	3	50	100	-	-
Paper 3: Applied pathology and Microbiology related to critical care	3	50	100	-	-

SECOND YEAR

SUBJECTS	THEORY				
	Hours	**Internal**	**University**	**Internal**	**University**
Paper 1: General Critical care	3	50	100	50	100
Paper 2: General Critical care including basic statistics	3	50	100	-	-

THIRD YEAR

SUBJECTS	THEORY				
	Hours	**Internal**	**University**	**Internal**	**University**
Paper 1: Advanced Critical care part I	3	50	100	50	100
Paper 2: Advanced Critical care part II	3	50	100	50	100

SYLLABUS

Epidemiology, Biostatistics and Medical Ethics

UNIT I: Epidemiology

Introduction: Historical aspects and evolution of epidemiology, definitions and concepts in Epidemiology.
Approaches in epidemiology: Descriptive and analytical epidemiology, disease burden, natural history of diseases and measures of risk and death.
Study design and sampling: Sample size estimation and introduction to study design in epidemiological investigations.

UNIT II: Biostatistics

Fundamentals of biostatistics: Introduction, types of data, tabular and graphical presentation of data. Measures of location, dispersion and correlation: Measures of central tendency. Mean, mode, median, GM, HM, quartiles Measures of dispersion—ra nge, standard deviation, variance, coefficient of variation.
Probability and statistical inference: Concept and probability distribution. Normal distribution—density curves, applications and statistical tables. Concept of significance tests, parametric and nonparametric tests, standard error and confidence intervals.
Inferential statistics: Probability and distributions – Poisson, Binomial a nd Normal distribution – Chi-square test – Hypothesis test - Student's t-tes t – Correlation and Regression – ANOVA.

UNIT III: Medical Ethics

Bioethics and Medical ethics: Historical perspectives & Introduction to Bioethics, Nuremberg Code, Declaration of Helsinki, Principle of essentiality, informed consent, confidentiality, minimisation of risk, accountability and responsibility. Ethics of clinical trials: Drug trials, vaccine trials, Clinical trials with medical devices/surgical procedures/radioactive materials, Research in transplantation and stem cell therapy. Regulatory framework and guidelines for conduction of human research: Review processes, Institutional ethical committees, composition of committees, review procedures, WHO, UNESCO and ICMR guidelines.

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Epidemiology: Beyond the Basics. F. Javier Nieto, Moyses Szklo. Latest edition / Pub. Date: November 2003. Publisher: Jones & Bartlett Publishers, Inc.

Basic and Clinical Biostatistics. Beth Dawson, Robert G. Trapp, Robert Trapp. Latest edition / Pub. Date: March 2004.

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