

**THE TAMIL NADU Dr M.G.R. MEDICAL UNIVERSITY,  
NO.69, ANNA SALAI, GUINDY, CHENNAI - 32**



**(PostGraduate Degree Course Under Allied Health Science)**

## **Syllabus**

**FOR M.Sc., (NEURO SURGICAL CARE)**

**A.Y 2025 - 2026**

**THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY,  
CHENNAI – 32.**

**SYLLABUS - M.Sc. Neuro Surgical care  
(Post-Graduate Degree Courses under Allied Health Sciences)**

**From the academic year 2025 - 2026**

The course covers a period of 2 years (24months). Theory and practical experience are integrated during the first year. The second year is meant to provide advanced professional experience enriched with academic activities.

**A. Time Schedule for First Year and Second year**

(Clinical 30hrs/week, Academic activities-10hrs/week)

**First Year:**

|                     |                      |
|---------------------|----------------------|
| Academic activities | 420Hrs               |
| Clinical            | 1260hrs (Integrated) |
| Total               | 1680 Hrs             |

**Second Year**

(Clinical 36hrs/week, Academic activities-4hrs/week)

|                     |          |
|---------------------|----------|
| Academic activities | 168      |
| Clinical            | 1512     |
| Total               | 1680 Hrs |

**B. Course of Studies**

Distribution of hours and subject are as below

|   |                                                                                    | Hrs |
|---|------------------------------------------------------------------------------------|-----|
| 1 | Principles of Epidemiology, Research Methodology, Biostatistics and Medical Ethics | 75  |
| 2 | Nursing Basics                                                                     | 75  |
| 3 | Nursing Education                                                                  | 50  |
| 4 | Nursing Administration                                                             | 25  |

|   |                       |     |
|---|-----------------------|-----|
| 5 | Neuro care (Medical)  | 100 |
| 6 | Neuro care (Surgical) | 100 |
|   | Total                 | 425 |

### C. Clinical Rotation

First year (30hrs/week)

|   |                                                        | Hrs         | Weeks<br>of<br>posting |
|---|--------------------------------------------------------|-------------|------------------------|
| 1 | Neurosurgical Intensive Care Unit                      | 300         | 10                     |
| 2 | Neuro medical Intensive care unit                      | 300         | 10                     |
| 3 | Neuro Radiology                                        | 60          | 2                      |
| 4 | Noninvasive diagnostic Labs &<br>Outpatient department | 60          | 2                      |
| 5 | Medical/Surgical Wards                                 | 190         | 6                      |
| 6 | Stroke ICU                                             | 180         | 6                      |
| 7 | Neurosurgery Operation Theatre                         | 90          | 3                      |
| 8 | Neuro orientation & CNS Examination                    | 90          | 3                      |
|   | Total                                                  | <b>1260</b> | <b>42<br/>weeks</b>    |

## Second Year

(Clinical 36hrs/week, Academic activities 4hrs/week)

|                               |          |
|-------------------------------|----------|
| 1. Academic Activities & exam | 168 Hrs  |
| 2. Clinical                   | 1512 Hrs |
| Total                         | 1680 Hrs |

|   |                                                | Hrs  | Weeks of posting |
|---|------------------------------------------------|------|------------------|
| 1 | Neurosurgical Intensive Care Unit              | 288  | 8                |
| 2 | Neuro medical Intensive Care Unit & Stroke ICU | 360  | 10               |
| 3 | Interventional Radiology                       | 144  | 4                |
| 5 | Wards (Neurosurgery, Neuro medical )           | 288  | 8                |
| 6 | Neuroradiology                                 | 144  | 4                |
| 7 | Neurosurgery Operation Theatre                 | 288  | 8                |
|   | Total                                          | 1512 | 42 weeks         |

## 1. Principles of Epidemiology, Research Methodology, Biostatistics and Medical Ethics

### UNIT I: EPIDEMIOLOGY

#### Introduction:

Historical aspects and evolution of epidemiology, definitions and concepts in Epidemiology.

Natural history of disease. Approaches in Epidemiology. Descriptive and Analytical Epidemiology, Disease burden and Measures of risk and death. Epidemiological Investigations.

## **UNIT-II-RESEARCH METHODOLOGY**

Principles of Research study designs, Sampling Methods, Sample size Estimation, Protocol writing and Measures of Association.

Introduction to Operations Research.

## **UNIT III: 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—Range, 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 and Normal distribution—Chi-square test—Hypothesis test- Student's t-test—Correlation and Regression –ANOVA.

## **UNIT IV:MEDICAL ETHICS**

Bioethics and Medical ethics: Historical perspectives & Introduction to Bioethics, Nuremberg Code, Declaration of Helsinki, Principle of essentiality, informed consent, confidentiality, minimization 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 frame work and guidelines for conduction of human research: Review processes, Institutional ethical committees, composition of committees, review procedures, WHO, UNESCO and ICMR guidelines.

## **2 . NURSING BASICS**

Unit1.The Nursing Process:-

Concept, elements and Nursing care plans, Documentation, Quality Patient care

Unit2.Health promotion:-

Holistic approach of patient management, Emerging Trends - Speciality nursing, lifestyle

Unit3.Outpatient and emergency management:–

Out patient management, Medico legal cases, management of head injury, Mass casualty preparation and management, Cardiopulmonary resuscitation, medical and surgical emergencies.

Unit4.Hospital environment:-

Therapeutic environment, Hospital Infection control, Biomedical waste management, Ethical and legal issues related to patient care, Consumer protection Act

Unit5.Communication:-

Process, types, channels of communication, barriers, Improving effective communication, public interaction

### **3. NURSING EDUCATION**

To acquire knowledge about teaching and learning so as to assume the responsibility of an educator and mentor in critical Neurocare.

Unit1.Introduction to teaching

- Teaching and Learning
- Principles of teaching
- Methods of teaching

Unit 2.Introduction toLearning

- Learning Process
- Principles of learning
- Factors influencing learning

Unit 3.Lesson Planning

- Principles
- AV aids in teaching—preparation and use

Unit 4.Library Science

- How to use a library
- Cataloguing
- Bibliography
- Computerized medical information system

Unit 5. Evaluation

- Purpose, Planning, Problems
- Nature of instruments used to evaluate
- Advantages &Disadvantages of each instrument.

-

**Practical:**

Each student will conduct a minimum of three practice teaching in the class, and three supervised clinical presentations using different methods of teaching.

## **4. NURSING ADMINISTRATION**

Acquire knowledge about administration so as to assume the responsibility of managing critical care units

### **Unit1.Introduction**

- Current trends in administration of nursing
- Application of principles and techniques of administration
- Job Description and specification

### **Unit2.Nurse as a Manager**

- Concept of Supervision and management
- Qualities of a Supervisor
- Principles of management and methods of supervision
- Responsibilities of nurse manager in Critical Care Units.

### **Unit 3.Role in patient care**

- Planning Care
- Maintaining therapeutic environment
- Supplies and equipment
- Record and Reports
- Assigning duties & responsibilities
- Evaluation of Patient care

### **Unit 4.Role as an educator**

- Planning and conducting Clinical Teaching,
- Supervising members of Health team

### **Unit5.Role as an administrator**

- Delegation of responsibilities
- Performance appraisal
- Planning, Research & Project work assignments
- Co-ordination & Co-operation

## **4. Neuro Care Medical**

**100hrs**

### **Unit 1. Overview of Neuro anatomy and Neurophysiology**

- Embryonic development CNS
- Cranial and spinal Osteology
- Cells of the CNS
- Impulse conduction.
- Functions of nervous system
- Brain and spinal cord.
- Peripheral nervous system.
- Autonomic nervous system.
- Cranial nerves.
- Cerebrospinal fluid.
- Cerebral Blood circulation.
- Blood–Brain –Barrier.

### **Unit 2. Assessment of Patients with Neurologic Disorders**

- Nursing History
- The Neurological examination.
- Invasive and non-invasive diagnostic procedures.
  - X– rays
  - CT, MRI & Radionuclide imaging.
  - Electro Encephalography, Video EEG, Neuro Psychological tests.
    - Lumbar puncture and CSF studies.
    - Evoked potentials –Visual, auditory, somato sensory
    - Electromyography and nerve conduction studies.
    - Special senses examination
    - Digital Subtraction Angiography.
    - Blood tests

### **Unit 3. The Neuro Nurse**

- Principles and organization of Neuro ICU.

- Current concepts
- Nursing in the Neuro Intensive Care Unit
- Hemodynamic monitoring
- Intracranial pressure monitoring.

#### Unit 4. Nursing of Infections of the Nervous system

- Meningitis
- Encephalitis
- Parasitic Infections
- HIV and CNS

#### Unit 5. Nursing Process of Cerebrovascular Diseases

- Ischemic Cerebrovascular Disease
- Intra cerebral Hemorrhage

#### Unit 6. Nursing of Degenerative Diseases

- Alzheimer's disease
- Multiple sclerosis
- Parkinson's Disease
- Wilson's disease
- Dementia
- Motor Neuron Diseases

#### Unit 7. Nursing of Autoimmune/Neuro muscular Disorders

- Guillain Barre Syndrome
- Myasthenia gravis
- Muscular Dystrophies

#### Unit 8. Nursing in

- Coma
- Pain
- Epilepsy
- Hydrocephalus
- Mental retardation
- Neuromedical emergencies

- Drug therapy in neurologic disorders

#### Unit 9. Special Consideration in Neuro Care

- Discharge, Homecare.
- Rehabilitation
- Dementia, Pain, Dysphagia, Gait disorders, speech and language problems

### 5. Neuro Care Surgical

**100Hrs**

#### Unit 1. Neuro anatomy and Neuro physiology-applied surgical aspects

- Embryonic development CNS
- Cranial and spinal Osteology
- Cells of the CNS
- Impulse conduction.
- Functions of nervous system
- Brain and spinal cord.
- Peripheral nervous system.
- Autonomic nervous system.
- Cranial nerves.
- Cerebrospinal fluid.
- Cerebral Blood circulation.
- Blood–Brain –Barrier

## Unit 2. Assessment of Patients with Neurosurgical Problems

- X-rays
- CT, MRI & Radionuclide imaging.
- Electro Encephalography, Video EEG, Neuro Psychological tests.
  - Lumbar puncture and CSF studies.
  - Evoked potentials –Visual, auditory, somato sensory
  - Electromyography and nerve conduction studies.
  - Special senses examination
  - Digital Subtraction Angiography.
  - Blood tests

## Unit 3. Nursing of Congenital & Developmental Anomalies

- Hydrocephalus
- Cranio synostosis

## Unit 4. Nursing of trauma to the Neurological system

- Poly Trauma.
- Cranio cerebral Trauma.
- Vertebral and Spinal cord injury.
- Back pain and Inter vertebral Disc Prolapse
- Peripheral Nerve injuries.

## Unit 5. Nursing of Cerebro vascular Diseases

- Cerebral Aneurysms and subarachnoid hemorrhage
- Arteriovenous Malformations

## Unit 6. Nursing of

- Raised Intracranial Pressure
- Cerebral Edema

## Unit 7. Nursing of infections of the CNS

- Brain abscess
- CSF Leak

## Unit 8. Nursing of Neurosurgical and Interventional Procedures

- Intracranial Tumors
- Paediatric brain tumours
- Spinalcord tumors
- Craniovertebral anomalies.
- Neurosurgical procedures and other interventional procedures
  - Interventional Neuroradiology
  - Stereotactic Surgery
  - Neuro endoscopy
  - Radio surgery
  - Deep Brain Stimulation
  - Surgery for Epilepsy

## Unit 9. Special Consideration in Neurosurgical nursing

- Discharge and Homecare.
- Post operative Problems , Rehabilitation
  - Psychosocial Problems, Pain, Dysphagia, Gait disorders, Impairment of speech and language
- Radiotherapy coping strategies

## METHOD OF EVALUATION

Sessional tests, Written assignments, Assessment of seminars and project, Term paper, Clinical presentation, Evaluation of clinical performance, Practical examinations and viva voce.

## References & Recommended Books

### **Principles of Epidemiology, Research Methodology, Biostatistics and Medical Ethics**

1. Epidemiology: An Introduction. Kenneth J.J.Rothman. Latest edition / Pub. Date: May 2002. Publisher: Oxford University Press.
1. Epidemiology. Leon Gordis. Latest edition / Pub. Date: November 2004. Publisher: Elsevier Health Sciences.
2. Diseases and Human Evolution. Ethne Barnes. Latest edition / Latest edition / Pub. Date: March 2005. Publisher: University of New Mexico Press.
3. Epidemiology: Beyond the Basics. F. Javier Nieto, Moyses Szklo. Latest edition / Pub. Date:

- November 2003. Publisher: Jones & Bartlett Publishers, Inc.
4. Basic and Clinical Biostatistics. Beth Dawson, Robert G.Trapp, Robert Trapp. Latest edition/Pub. Date: March 2004.
  5. Discovering Statistics Using SPSS. Andy Field. Latest edition / Pub. Date: April 2005. Publisher : SAGE Publications.
  7. Arora PN & Malhon PK (1996). Biostatistics Imalaya Publishing House, Mumbai.
  8. Sokal & Rohif (1973). Introduction to Biostatistics, Toppan Co. Japan.
  9. Stanton A & Clantz, Primer of Biostatistics — The McGraw Hill Inc.,New York.
  10. Government of India. Good Clinical Practices for Clinical Research inIndia. NewDelhi:2001
  11. Indian Council of Medical Research. Ethical Guidelines for BiomedicalResearchonHumanSubjects.NewDelhi:2000
  12. United Nations Educational, Scientific and Cultural Organisation (UNESCO). Universal Declaration on Bioethics and Human Rights. Paris;2005

## **NURSING BASICS**

1. Gulanick Meg et al. Nursing Care Plans, Nursing Diagnosis and Interventions (5<sup>th</sup>ed).St.Louis: Mosby, 2003.
2. Lynda, Juall Carpenito. Nursing Diagnosis-Application to clinical Practice(9<sup>th</sup> ed) .Philadelphia: Lippincott; 2002.

## **NURSING EDUCATION**

1. Aggarwal JC. Essentials of Educational Technology: Teaching Learning Innovations in Education. NewDelhi: Vikas Publishing House Pvt Ltd.1996.
2. Bastable, Susan b. Nurse as Educator (2<sup>nd</sup> ed). Boston: Jones and BartlettPublishers,2003.

## **NURSING ADMINISTRATION**

1. Huber, Diane. Leadership and Nursing care Management (2<sup>nd</sup> ed). Philadelphia: WBS aunders Co; 2000.
- 2.Yoder-wise, Patricia S. leading and Managing in Nursing (3<sup>rd</sup>ed). St.Louis:Mosby,2003.
3. Best Practices—A Guide to Excellence in Nursing Care. Philadelphia: Lippincott William and Wilkins, 2002

## **NEURO NURSING TEXTS**

1. Hickey,J oanneV. The Clinical Practiceof Neurological and Neurosurgical Nursing (8<sup>rd</sup>ed) : Philadelphia: JB LippincottCo., 2016
2. Chipps, Esther. Neurologic Disorders .St. Louis : Mosby Year book,1992.
3. Pallet, PhyllisJ, and MTO' Brien. Textbook of Neurological nursing. St.Louis: The CV MosbyCo., 1984.
4. Rudy, EllenB. Advanced Neurological and Neurosurgical Nursing.St. Louis: The CV MosbyCo., 1984.

5. Purchase Gillian and Douglas Allan. Neuromedical and Neurosurgical Nursing (2<sup>nd</sup> ed). London : Bailliere Tindall, 1984.
6. Nikas, Diana L. The critically ill Neurosurgical patient. New York: Churchill Livingstone, 1982.
7. Lindsay, Margot. Communicating with neurological patients. The nurses role. London: Scutari Press, 1990
8. Swift–Bandini. Manual of Neurologic nursing' Boston: Little Brown and Co., 1982.
9. Snyder. M. A guide to neurological Neurosurgical nursing. New York : Wiley Publishing, 1983.
10. Mitchell, Marylynne. Neuro Science Nursing—a nursing diagnosis approach. Baltimore: William Wilkins, 1989.
11. Shoran, SD. Neurological emergencies-London: Butterworths, 1989.
12. Sinclair G. Morag. Nursing the Neurosurgical patient. London, Butterworths, 1991.
13. Barbara Verran Pamela Aisbitt. Neurological and Neurosurgical Nursing. Edward Arnold Publishers.
14. Marshall, Marshal Vos Chestnut. Neuro science Critical care—Pathophysiology and patient management. WB Saunders , 1990.
15. AANN. Core Curriculum for Neuro science Nursing (3<sup>rd</sup> ed). 1996.
16. Barker, Ellen. Neuro science Nursing. St .Louis : CV Mosby Co., 1994
17. Stewart-Amidei Chris and Joyce A Kunkel. A ANN's Neuroscience Nursing: Human Responses to Neurologic Dysfunction (2<sup>nd</sup> Ed). Philadelphia: WB Saunders Co; 2001.
18. Lindsay, Margot. Communicating with Neurological Patients: The Nurses Role. London: Scutari Press 1990.

## **CRITICAL CARE NURSING**

- a. Morton P G, Fontaine D K. Essentials of Critical Care Nursing: A Holistic Approach. Tenth Edition. Philadelphia : Lippincott Williams & Wilkins; 2013.
- b. Sole M L, Klein D G, Moseley M J. Introduction to Critical Care Nursing. Sixth Edition. Missouri: Elsevier; 2013.
- c. Schell HM, Puntillo KA. Critical Care Nursing Secrets. Second Edition. Missouri: Mosby Elsevier; 2006.

## **JOURNALS**

- a. Journal of Neuroscience Nursing
- b. Critical Care Nurse
- c. Journal of Radiology Nursing
- d. Journal of Peri anaesthesia Nursing
- e. International Journal of Trauma Nursing
- f. International National Journal of Nursing Studies
- g. Nursing Education in Practice

\*\*\*\*\*