

Faculty of Medicine



JSS Academy of Higher Education & Research

(Deemed to be University)

Accredited "A" Grade by NAAC

Sri Shivarathreshwara Nagar, Mysuru – 570 015

Regulation & Syllabus

DM Neurology
2016

DM Neuro

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DM NEUROLOGY

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REGULATION AND SYLLABUS FOR SUPER SPECIALITY DEGREE PROGRAMS 2016

DM NEUROLOGY



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CHAPTER I

Regulations for Super Speciality Degree in Medical Sciences

1. Branch of Study

Super Speciality Degree courses may be pursued in the following subjects:

- a. **DM (Doctor of Medicine)**
 - i. Neurology
 - ii. Medical Gastroenterology
 - iii. Nephrology

- b. **MCh (Master of Chirurgie)**
 - i. Urology

2. Eligibility for Admission

A candidate should have passed recognised degree of M.D. or M.S. (or its equivalent recognised degree) in the subject shown against them in a medical college recognized by the Medical Council of India, or from a recognized medical college affiliated to any other Deemed to be University recognized as equivalent thereto and has completed one year compulsory rotating internship in a teaching institution or other institution recognized by Medical Council of India and has obtained permanent registration of any State Medical Council shall be eligible for admission.

Sl. No.	Name of the Degree	Eligibility for admission
1	DM Neurology	MD (Medicine) or MD Paediatrics)
2	DM Medical Gastroenterology	MD (Medicine) or MD Paediatrics)
3	DM Nephrology	MD (Medicine) or MD Paediatrics)
4	MCh Urology	MS (Surgery)

3. Obtaining Eligibility Certificate by the Deemed to be University before making admission

No candidate shall be admitted for any Super Speciality courses unless the candidate has obtained and produced the eligibility certificate issued by the Deemed to be University. The candidate has to make an application to the Deemed to be University with the following documents along with the prescribed fee:

- a. UG and PG pass/degree certificate issued by the Deemed to be University.
- b. Mark cards of all the Deemed to be University examinations passed before PG course.
- c. Attempt certificate issued by the Principal.
- d. Certificate regarding the recognition of the medical college by the Medical Council of India
- e. Completion of internship certificate.
- f. In case internship was done in a non- teaching hospital, a certificate from the Medical Council of India that the hospital has been recognized for internship.

g. Registration by any state Medical Council.

h. Proof of ST/SC or Category I, as the case may be.

Candidates should obtain the eligibility certificate before the last date for admission as notified by the Deemed to be University.

A candidate who has been admitted to super speciality course should register his / her name in the Deemed to be University within a month of admission after paying the registration fee.

4. Intake of students

The intake of students to each course shall be in accordance with the MCI and GOI permissions in this regard.

5. Course of study

The course of study shall be for a period of 3 years consisting of 6 terms.

6. Method of training

The training of super specialty degree shall be residency pattern, with graded responsibilities in the management and treatment of patients entrusted to his/ her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, grand rounds, case demonstration, clinics, journal review meetings, CPC and clinical meetings. Every candidate should be required to participate in the teaching and training programme of undergraduate students. Training should include involvement in laboratory and experimental work, and research studies. Basic medical sciences students should be posted to allied and relevant clinical departments or institutions. Similarly, clinical subjects' students should be posted to basic medical sciences and allied specialty departments or institutions.

7. Attendance, Progress and Conduct

- A candidate pursuing super specialty degree course, should work in the concerned department of the institution for the full period as full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduate course, nor can he/she work in a nursing home or other hospitals/clinic/laboratory while studying super specialty course.
- Each year shall be taken as a unit for the purpose of calculating attendance.
- Every student shall attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each year as prescribed by the department and not absent himself / herself from work without valid reasons.
- Every candidate is required to attend a minimum of 80% of the training during each academic year of the post graduate course. Provided, further, leave of any kind shall not be counted as part of academic term without prejudice to minimum 80% attendance of training period every year.
- Any student who fails to complete the course in the manner stated above shall not be permitted to appear for the Deemed to be University Examinations.

8. Monitoring Progress of Studies:

- **Work diary / Log Book:** Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be

made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. The work diary shall be scrutinised and certified by the Head of the Department and Head of the Institution, and presented in the Deemed to be University practical/clinical examination.

- **Periodic tests:** In case of degree courses of three years duration (MD/MS, DM, M Ch.), the concerned departments may conduct three tests, two of them be annual tests, one at the end of first year and the other at the end of the second year. The third test may be held three months before the final examination. The tests may include written papers, practical / clinical and viva voce. Records and marks obtained in such tests will be maintained by the Head of the Department and sent to the Deemed to be University, when called for.
- **Records:** Records and marks obtained in tests will be maintained by the Head of the Department and will be made available to the Deemed to be University or MCI.

9. Dissertation

- Every candidate pursuing super specialty degree course is required to carry out work on a selected research project under the guidance of a recognised post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.
- The dissertation should be written under the following headings
 - a. Introduction
 - b. Aims or Objectives of study
 - c. Review of Literature
 - d. Material and Methods
 - e. Results
 - f. Discussion
 - g. Conclusion
 - h. Summary
 - i. References
 - j. Tables
 - k. Annexure
- The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexure. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.
- Four copies of dissertation thus prepared shall be submitted to the Controller of Examinations, six months before final examination, on or before the dates notified by the Deemed to be University.
- The dissertation shall be valued by examiners appointed by the Deemed to be University. Approval of dissertation work is an essential precondition for a candidate to appear in the Deemed to be University examination.
- Before submitting the dissertation to the Deemed to be University the candidate should have presented at least one scientific paper based on the

dissertation at a national/international conference or Published or submitted for publication with acceptance, at least one scientific paper based on the dissertation in a national/international indexed journal. The candidate should be the first author.

- **Guide:** The academic qualification and teaching experience required for recognition by this Deemed to be University as a guide for dissertation work is as per Medical Council of India, Minimum Qualifications for Teachers in Medical Institutions Regulations, 1998. Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as Lecturer or Assistant Professor gained after obtaining higher specialty degree shall be recognised as post graduate teachers.
- **Co Guide:** A Co-guide may be included provided the work requires sub-

stantial contribution from a sister department or from another medical institution recognised for teaching/training by JSS Deemed to be University / Medical Council of India. The co-guide shall be a recognised post graduate teacher of JSS Deemed to be University.

- **Change of guide:** In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the Deemed to be University.

10. Schedule of Examination

The examination for DM and MCh courses shall be held at the end of three years.

11. Scheme of Examination

DM/MCh

The examination shall consist of theory, clinical/practical and viva voce examination.

- **Theory (Written Examination):** The theory examination shall consist of four question papers, each of three hours duration. Each paper shall carry 100 marks. Out of the four papers, the first paper will be on basic medical sciences. Recent advances may be asked in IV Paper.
- **Practical / Clinical Examination:** In case of practical examination it should be aimed at assessing competence, skills of techniques and procedures as well as testing student's ability to make relevant and valid observations, interpretations and experimental work relevant to his / her subject. In case of clinical examination it should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine at least one long case and two short cases. The maximum marks for Practical / Clinical shall be 200.
- **Viva-Voce:** Viva Voce examination shall aim at assessing thoroughly, depth of knowledge, logical reasoning, confidence and oral communication skills. The maximum marks shall be 100. This also includes spotters like instruments, anaesthesia machines, drugs, ECG, X – ray.
- **Examiners:** There shall be at least four examiners in each subject. Out of them, two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the Medical Council of India.
- **Criteria for declaring as pass in Deemed to be University Examination*:** A candidate shall secure not less than 50% marks in each head of passing which shall include (1) Theory (2) Practical including clinical and viva voce examination. A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Registrar (Evaluation).
- **Declaration of distinction.** A successful candidate passing the Deemed to be University examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate marks is 75 percent and above. Distinction will not be awarded for candidates passing the examination in more than one attempt.

12. Number of Candidates per day

The maximum number of candidates for practical / clinical and viva-voce examination shall be as under:

DM /MCh Course: Maximum of 6 per day.

CHAPTER II

GOALS AND GENERAL OBJECTIVES OF SUPER SPECIALTY MEDICAL EDUCATION PROGRAM

GOAL

The goal of super specialty medical education shall be to produce competent specialists and/or medical teachers:

1. Who shall recognize the health needs of the community and carry out professional obligations ethically and in keeping with the objectives of the national health policy.
2. Who shall have mastered most of the competencies, pertaining to the specialty, that are required to be practiced at the secondary and the tertiary levels of the health care delivery system.
3. Who shall be aware of the contemporary advance and developments in the discipline concerned.
4. Who shall have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology and
5. Who shall have acquired the basic skills in teaching of the medical and para-medical professionals.

GENERAL OBJECTIVES

At the end of the super specialty training in the discipline concerned the student

shall be able to:

1. Recognize the importance to the concerned speciality in the context of the health needs of the community and the national priorities in the health section.
2. Practice the speciality concerned ethically and in step with the principles of primary health care.
3. Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.
4. Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic, rehabilitative, preventive and primitive measure/strategies.
5. Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
6. Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the speciality.
7. Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
8. Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the societal norms and expectations.
9. Play the assigned role in the implementation of national health programme, effectively and responsibly.
10. Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
11. Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
12. Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
13. Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
14. Function as an effective leader of a health team engaged in health care, research or training.

STATEMENT OF THE COMPETENCIES: Keeping in view the general objectives of postgraduate training, each discipline shall aim at development of specific competencies which shall be defined and spelt out in clear terms. Each department shall produce a statement and bring it to the notice of the trainees in the beginning of the programme so that he or she can direct the efforts towards the attainment of these competencies.

COMPONENTS OF THE SUPER SPECIALTY CURRICULUM:

The major components of the super specialty curriculum shall be:

- Theoretical knowledge
- Practical and clinical skills
- Thesis skills.
- Attitudes including communication skills.
- Training in research methodology.

Chapter III

Syllabus DM Neurology

I. GOALS:

DM (Neurology) course is designed to train the candidates in the principles and practice of advanced Neurology to equip them to function as faculty/consultants and as researcher in Neurology.

- To train physicians in the scientific aspects of the specialty of Neurology.
- To empower them to practice the specialty of Neurology with competence, care, and compassion thereby delivering the highest standard of Neurological care to the community.
- To empower the trainee in academic and research aspects of Neurology; to empower the trainee to become an effective teacher and communicator in Neurology.
- To establish the required training methods, evaluation methodology, and qualifying norms for the successful completion of the DM course in Neurology.

II. OBJECTIVES:

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The objectives may be considered under the subheadings.

1. Knowledge
2. Skills
3. Human values, ethical practice and communication abilities.

1. Knowledge

The candidate shall be proficient in all the fields of Neurology including general neurology, epileptology, cerebrovascular disorders, cognitive neurology, behavioral neurology, neuro-endocrinology, movement disorders, pediatric neurology, geriatric neurology, neuro-ophthalmology, neuro-otology, neuro-degenerative disorders, neurochemistry, neurophysiology, neuroanatomy, neuropathology, neurogenetics, electrophysiology, neuroradiology and related fields that form the specialty of Neurology.

- To provide the candidate with the current, scientific and evidence based knowledge pertaining to the abovementioned areas in Neurology.
- To impart the skills to undertake independent clinical practice in the above areas of Neurology and to provide opportunities to the practice of these skills in a graded manner and under suitable supervision to a point where the candidate is capable of practicing these skills independently.
- To inculcate in the candidate an attitude of responsibility, accountability and caring, to empower the candidate with a good and sound foundation of ethical values in the practice of Neurology, and to develop in the candidate the ability to effectively communicate with patients, peers, superiors, and the community in the discharge of his / her clinical and research role.

2. Skills: The candidate admitted to the DM Neurology course shall master the following skills.

- Clinical evaluation and management of diverse neurological disorders.
- Be proficient in the management of common neurological emergencies.
- Able to perform diagnostic investigations like lumbar puncture, biopsies of the nerve and muscle, etc.
- Able to perform and interpret the neurodiagnostic investigations like nerve conduction studies, electromyography, evoked potentials and electroencephalography.

3. Human values, ethical practice and communication abilities.

- Adopt ethical principles in all aspects of his/her practice; professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his / her team in a congenial working atmosphere.
- Apply high moral and ethical standard while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed,
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

III. COURSE CONTENTS:

Basic Sciences

- **Neuroanatomy**

- Neuroanatomy of Central, Peripheral and Autonomic nervous system
- Neuromuscular junction & muscle
- Histology of central and peripheral nervous system
- Functional Neuroanatomy
- Cerebrospinal fluid
- Blood brain barrier
- Embryology & development of nervous system
- Cerebral circulation

- **Neurophysiology & Neurochemistry**

- Neuronal signaling
- Synapse
- Neurotransmission (chemical & electrical)
- Somatosensory physiology
- Visual perception
- Auditory perception
- Motor control & generation of normal movement
- Tone
- Posture and Gait
- Higher cerebral functions, Memory, Language
- Sleep
- Neuro-endocrinology

- Autonomic nervous system
- **Neuropharmacology**
- **Neuro-Genetics**
- **Neuroradiology**
 - Plain radiography of skull & spine
 - Myelography
 - Angiography
 - C.T. Scan
 - Magnetic resonance imaging
 - Doppler study of the cerebral circulation
 - Functional cerebral imaging (PET, SPECT)
- **Neuropathology:**
 - Interpretation of gross specimens of cerebral pathology
 - Histology of nerve, muscle, and brain.
 - Histopathology of muscle
 - Histopathology of brain
 - Histochemistry and immuno-histochemistry
- **Neurology**
 - Disorders of consciousness
 - Disorders of cortical functions
 - Language disorders
 - Cerebrovascular disorders
 - Epilepsies
 - Headache
 - Movement disorders
 - Ataxias & disorders of cerebellum
 - Gait disorders
 - Cranial Neuropathies
 - Demyelinating & dysmyelinating disorders
 - Infections of central and peripheral nervous system
 - Metabolic disorders of nervous system
 - Nutritional disorders of the nervous system
 - Diseases due to toxins, chemicals & drugs
 - Congenital and Developmental disorders of nervous system
 - Neoplasia of nervous system
 - Craniospinal trauma
 - Cerebrospinal Fluid disorders
 - Hydrocephalus
 - Mental retardation
 - Cerebral palsy
 - Disease of peripheral nerves
 - Neuromuscular junction disorders
 - Disease of muscles
 - Neuropsychology
 - Neuropsychiatry
- **Clinical Neurophysiology:**

- **Electroencephalography (EEG)**
 - Neurophysiological basis of EEG
 - EEG Recording techniques
 - Normal EEG including Sleep EEG
 - Maturation of EEG
 - Abnormal EEG
 - Video EEG and Long-term recording
 - Quantitative EEG
 - Brain death
- **Magnetoencephalography**
- **Nerve Conductions**
 - Principles of nerve conduction studies
 - Late responses
 - Repetitive nerve stimulation
 - Refractory period and Collision technique
 - Autonomic nervous system evaluation
- **Electromyography (EMG)**
 - Principles of needle EMG
 - EMG in peripheral Nervous system diseases
 - EMG in central nervous system diseases
 - Qualitative EMG
 - Quantitative EMG
 - MUAP analysis
 - Interference analysis and Turns-Amplitude Ratio
 - Single Fiber EMG
- **Evoked potentials**
 - Visual evoked potentials
 - Somatosensory evoked potentials
 - Brainstem auditory evoked potentials
 - Event related potentials
 - Movement related cortical potentials
- **Magnetic Stimulation**

IV. TEACHING AND LEARNING ACTIVITIES:

a. Theoretical Teaching:

1. **Lectures:** Lectures are to be kept to a minimum. Certain selected topics can be taken as lectures. Lectures may be didactic or integrated.
2. **Journal Club:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book the relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable with names of the students and the moderator should be announced in advance.
3. **Subject Seminar:** Recommended to be held once a week. All the PG

students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. The presentations would be evaluated using checklists and would carry weightage for internal assessment. A timetable for the subject with names of the students and the moderator should be announced in advance.

4. **Case Discussion:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the case presentation with names of the students should be announced in advance.
5. **Ward Rounds:** Ward rounds may be service or teaching rounds.
 - a. Service Rounds: Postgraduate students should do service rounds every day for the care of the patients. Newly admitted patients should be worked up by the post graduate student and presented to the faculty members the following day.
 - b. Teaching Rounds: Every unit should have 'grand rounds' for teaching purpose at the bed side. A diary should be maintained for day-to-day activities by the post-graduate students. Entries of 5(a) and 5(b) should be made in the Log book.
6. **Clinicopathological Conference:** Recommended once a month for all post graduate students. Presentation to be done by rotation. Presentations will be assessed using checklist. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.
7. **Inter-Departmental Meetings:** Recommended particularly with departments of Pathology and Radio-Diagnosis at least once a month. These meetings should be attended by post-graduate students and relevant entries must be made in the Log Book.
8. **Radio-diagnosis:** Interesting cases and the imaging modalities should be discussed. Emphasis should be given for the radiological differential diagnosis.
9. **Mortality Meeting:** The mortality meeting should be conducted in the department every month. The post graduate student should prepare the details regarding the cause of death after going through the case records in detail, and should present during the mortality meeting. The death records will be discussed in detail during this meeting.
10. **Teaching Skills:** Post-graduate students must teach under graduate students (e.g. Medical, Nursing) by taking demonstrations, bedside clinics, tutorials, lectures etc. Assessment is made using a checklist by medical faculty as well as by the students. Record of their participation is to be kept in Log Book. Training of postgraduate students in Educational Science and Technology is recommended.
11. **Continuing Medical Education Programs (CME):** Recommended that at least one national level CME programs should be attended by each student during the course.
12. **Conferences:** Attending conference is compulsory. Post-graduate stu-

dent should attend at least one national and one state level conference during the course.

13. Research Activities: The Post-graduate students to be encouraged to carry out research activities in the department.

- a. The candidate shall publish at least one research paper in a national or international indexed journal during the course period.
- b. In addition, the candidate shall present at least one paper in the national or international conference.

b. Clinical / Practical Training:

1. Rotational Postings in other Departments:

i. Neurology	30 months
ii. Neurosurgery	1 month
iii. Psychiatry	1 month
iv. Clinical Neurophysiology	1 month
v. Radiology	1 month
vi. Neuropathology	15 days
vii. Neuropsychology	15 days
viii. Mandatory postings(Paediatrics)	1 month

During the course the student shall undergo the training on par the standards of the MCI. They are expected to attend routine ward duties (writing case sheets, daily progress notes and discharge summaries) and learn the practical procedures like lumbar puncture, muscle biopsy and nerve biopsy. In addition the students are expected to attend emergency call duties to enhance their skills in practical management of acute neurological conditions. During their clinical neurophysiology posting the candidates are expected to learn the practical aspects of recording electroencephalograms and perform the recording under the supervision. Also they are expected to learn the techniques of performing nerve conduction studies, electromyography and evoked potentials and perform the procedures. Following completion of their posting in clinical neurophysiology the students are encouraged to perform the procedures on a ongoing basis.

During the course of their ancillary postings the students are expected to improve their skills by observing procedures or by learning administration of specialized tests relevant to their needs in the field of Neurology. The units / Institutions where the students are posted shall be requested to monitor the progress, punctuality and report back to the institution if any deficiencies are noted in the candidates.

Any short coming in the students' progress shall be subject to the rules of the Deemed to be University as may be decided by the relevant authorities.

V. Other Criteria to Fulfill for the Degree Course:

1. Internal evaluation:

During the course of three years, the department will conduct three tests. Two of them will be annual, one at the end of first year and other at the end of second year. The third test will be a preliminary examination which may be held three

months before the final examination. The test may include the written papers, practicals / clinical examination and viva-voce. Records and marks obtained in such tests will be maintained by the head of the department and will be sent to the Deemed to be University when called for.

Results of all evaluations should be entered into PG's diary and departmental file for documentation purposes. Main purpose of periodic examination and accountability is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

2. Maintenance of Log Book:

Every candidate shall maintain a Log book/work diary and record his/her participation in the training programs conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. All the procedures performed by the post graduate students should be entered in the Log book. All the daily activities including the ward rounds and the routine procedures performed on day to day basis should be entered in the Log book and it should be verified and signed by the faculty member. The Log book shall be scrutinized and certified by the Head of the Department and Head of the Institution, and presented in the Deemed to be University practical/clinical examination.

VI. SCHEME OF EXAMINATION:

Candidates will be allowed to appear for examination only if attendance (minimum 80%) and internal assessment are satisfactory and research / publication work is satisfactory.

i. Theory: 400 Marks

The theory examination shall consist of four question papers, each of three hours duration. Each paper shall carry maximum of 100 marks and the total maximum marks would be 400.

The format for the theory paper shall be as follows:

Type of Questions	No. of Questions	Marks for each question	Total Marks
Long essay	02	20	40
Short essay	06	10	60
Grand Total			100

- Paper I - Basic Science (Neuroanatomy, Neurophysiology, Neurochemistry, Neuropathology, Neuropharmacology)
- Paper II - Clinical Neurology
- Paper III - Clinical Neurology and Investigative Neurology
- Paper IV - Recent Advances

Note: The distribution of topics shown against the papers is suggestive only and may overlap or change.

ii. Clinical Examination: 200 Marks

Types of Cases	No. of Cases	Marks	Duration
Long Case	1	80	1 Hour
Short Case	3	120(40x3)	30 Min. each
Total	4	200	

iii. Viva-Voce Examination including specimen, radiology, electrophysiological data: 100 Marks

Aims: To elicit candidate's knowledge and investigative/ therapeutic skills.

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be given gross specimens, histopathology slides, clinical neurophysiological investigations like electroencephalogram, nerve conduction studies, electromyography and evoked potentials; Radiological investigations including CT scan and Magnetic Resonance Imaging, etc., for interpretation and questions on these as well as use of instruments will be asked. Student's knowledge on use of instruments and drugs will also be evaluated during viva-voce examination.

iv. Maximum Marks:

Theory	Clinical Examination	Viva including spotters	Grand Total
400	200	100	700

v. Passing criterion

To pass the examination the candidate must secure at least 50% of marks in each head of theory and practicals including viva separately.

VII. Recommended Books:

a. Essential Books (Latest Editions)

Serial Number	Title	Author	Publisher
1	Adams and Victor's Principles of Neurology	Ropper AH, Brown RH	Mc Graw –Hill
2	Neurology in Clinical Practice (Volume 1&2)	Bradley WG, Daroff R B	Butterworth Heinemann
3	Localization in Clinical Neurology	Brazis P W, Masdeu J C	Lippincott- Williams & Wilkins
4	De Jong's Neurological Examination	Haerer A F	Lippincott –Raven
5	Principles of Neural Sciences	Kandel ER , Schwartz J H	Mc Graw –Hill
6	Core Text Book of Neuroanatomy	Carpenter	Churchill Livingstone

7	Greenfield's Neuropathology (vol. 1 & 2)	Graham DI, Lantos P	Arnold Heinemann
8	Merritt's Textbook of Neurology	Rowland L P	Lea and Febriger
9	Brain's Diseases of the Nervous system	Donaghy M.	Lippincott – Raven
10	Pediatric Neurology	Swaiman and Wright	Mosby

The authors / editors may change with newer editions.

b. References (Latest Editions)

Serial Number	Title	Author	Publisher
1	Mayo Clinic Examinations In Neurology	Mayo Clinic	Mosby
2	Technique of The Neurologic Examination A Programmed Text	De Meyer WE	Mc – Graw Hill
3	Current Therapy In Neurologic Diseases	Johnson RT, Griffin JW	Mosby
4	Introduction to clinical Neurology	Gelb D J	Butterworth Heinemann
5	Text Book of Clinical Neurology	Goetz C G.	Butterworth Heinemann
6	Current Practice of Clinical Electroencephalography	Ebersole JS, Pedley TA.	Lippincott – Williams & Wilkins
7	Atlas and Classification of Electroencephalography	Luders HO, Hoachtar S	Mosby
8	Epilepsy- A Comprehensive Textbook (Volume 1, 2,& 3)	Engel J, Pedley TA	Lippincott – Williams & Wilkins
9	Antiepileptic Drugs	Levy RH, Mattson RH	Churchill Livingstone
10	Electromyography in Clinical Practice	Katirji B.	Mosby
11	Electrodiagnosis in Clinical Neurology	Aminoff M J.	Churchill Livingstone
12	Peripheral neuropathy Volume I & II	Dyck PJ, Thomas PK	W.B.Saunders Company
13	Myology Basic and Clinical (Vol. I & II)	Engel AG, Franzi-Armstrong C.	Mc Graw Hill
14	Diabetic Neuropathy	Dyck PJ , Thomas PK.	W.B. Saunders Company
15	Sleep And Movement Disorder	Chokraverty S, Hening WA.	W.B. Saunders Company

16	Behavioral Neurology	Kirshner H S.	Butterworth Heinemann
17	Dementias	Mendez MF, Cum- mings JL	Butter worth Heinemann
18	Non- Epileptic Seizures	Gates JR, Rowan AJ.	Butterworth Heinemann
19	Clinical Neurophysiology of Infancy, Childhood And Adolescence.	Holmes GL , Moshe SL.	Butterworth Heinemann
20	Central Nervous system infectious diseases and therapy	Roos K L	Marcel Dekker Inc.
21	AIDS and the Nervous System	Levy RM , Berger JR.	Lippincott Raven
22	Viral Infections of the Ner- vous System	Johnson RT.	Lippincott Raven
23	Text Book of Neurology	Chopra JS , Arjun- das G.	Churchill Livingstone
24	Principles and Practice of Sleep Medicine	Kryger MH , Roth T.	Orient Longman
25	Synopsis of Psychiatry	Kaplan and Sad- dok	Lippincott William & Wilkins
26	Organic Psychiatry	Leishman	
27	Principles And Practice of Behavioral Neurology Neu- ropsychology	Rizzo M , Elsinger PJ.	W. B. Saunders Company
28	Neurologic and Neurosur- gical Emergencies	Cruz J	W. B. Saunders Company
29	Coma And Impaired Con- sciousness.	Young GB , Ropper A H.	MC- Graw – Hill
30	Neurological and Neuro- surgical Intensive Care	Ropper A H , Gress DR.	Lippincott Williams & Wilkins
31	Neurological Complications of Pregnancy	Hainline B.	Lippincott Williams & Wilkins
32	Cancer Neurology in Clini- cal Practice	Schiff D , Wen P.	Humana Press
33	Handbook of Dystonia.	Tsui J K, Colin DB.	Marcel Dekker Inc.
34	Handbook of Tremor Dis- orders	Findley L J , Koller W	Marcel Dekker Inc

35	Therapy with Botulinum toxin	Jankovic J , Hallett M.	Marcel Dekker Inc
36	Handbook of Cerebellar Diseases	Lechtenberg R	Marcel Dekker Inc
37	Gait Disorders	Ruzicka E , Hallett M.	Urban Schwarzenberg
38	Parkinson's Diseases	Duvoisin R , Sage J.	Lippincott Williams & Wilkins
39	Neurology in General Medicine	Aminoff MJ.	Churchill Livingstone
40	Office Practice of Neurology	Samuels M A , Feske S.	Churchill Livingstone
41	Diagnostic Testing In Neurology	Evans RW.	W.B. Saunders Company
42	Neuroimaging (Vol I & II)	Orrison WW	W.B. Saunders Company
43	Neuroradiology	Grossman RI , Yosem DM.	Mosby
44	Text Book of Neurological Surgery	Youmans	W. B. Saunders Company
45	Neurosurgery Principles And Practice	Setty R , Wilkins	Wolfe
46	Neurological Disabilities Assessment And Treatment	Bennett SE, Karnes.JL.	Urban Schwarzenberg
47	Clinical Neurology of the Older Adult	Sirven J I , Malamut B L.	Lippincott Williams & Wilkins
48	Mechanism And Management of Headache	Lance JW, Goadsby PJ.	Butterworth Heineemann
49	Channelopathies of the Nervous system	Rose MR, Griggs RC.	Butterworth Heineemann
50	Applications of The International Classifications of Diseases To Neurology	World Health Organization.	World Health Organization

The authors / editors may change with newer editions.

c. Reference Series

Sl. No.	Reference Series	Publisher
1	Handbook of Clinical Neurology	Elsevier
2	Advances in Neurology	Raven Press
3	Annual Review of Neurosciences	Annual Review, Palo Alto
4	Neurologic Clinics	Elsevier
5	Year Book of Neurology and Neurosurgery	Mosby

6	Butterworth's International Medical Reviews in Neurology	Butterworth Heine-mann
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VIII. RECOMMENDED JOURNALS:

Sl. No.	Journal	Publisher
1	Neurology	Lippincott Williams Wilkins
2	Journal of Neurology, Neurosurgery and psychiatry	B.M.J. Pub Group
3	Brain	Oxford University Press
4	Annals of Neurology	Wiley Blackwell
5	Stroke	American Medical Association
6	Neurology India	Medknow Publications
7	Annals of Indian Academy of Neurology	Medknow Publications
8	Clinical Neurophysiology.	Elsevier
9	Archives of Neurology	American Medical Association
10	Epilepsia	Wiley Blackwell



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