



**AMRITA**  
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**PROGRAM**  
**DM Neurology**  
**(Revised with effect from 2016-2017  
onwards)**

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# **REGULATIONS FOR THE POST GRADUATE HIGHER SPECIALITY DEGREE COURSES**

## **SHORT TITLE AND COMMENCEMENT**

These regulations shall come into force from the academic year 2007-2008.

The Regulations and the syllabi are as prescribed under these regulations and are subject to modification by the Standing Academic Board from time to time.

## **PROGRAM OBJECTIVES AND PROGRAM SPECIFIC OBJECTIVES**

### **Program Outcomes**

PO1: Broad understanding of the principles of Neurology necessary in the practice of the subject in the community.

PO2: Competence in intensive care with practical knowledge of working with resuscitative and monitoring equipments.

PO3: Ability to critically appraise published literature, interpret data and to broaden his/her knowledge by keeping abreast with modern developments in Neurology.

### **Program Specific Outcomes**

PSO1: Ability and skills to perform and interpret investigative procedures related to the specialty

PSO2: Skills in the clinical diagnosis, planning of investigations and manage common conditions in the specialty by relevant current therapeutic methods:

PSO3: Capabilities to take independent decisions in emergency situations, perform required procedures in Neurology and manage complications.

PSO4: Ability to search online, use information technology to his/her advantage and critically evaluate medical literature and draw his/her own conclusion.

PSO5: Ability to teach Post graduates, undergraduate and nursing students in the basic management of the diseases in Neurology.

PSO6: Familiarity with allied and general clinical disciplines to ensure appropriate and timely referral.

PSO7: Ability to conduct research.

PSO8: Ability to become a consultant and capability of organizing specialty Departments.

## **BRANCH OF STUDY**

Candidates shall be examined in one of the following branch

**D.M – Branch 1 – Neurology**

## **ELIGIBILITY**

Candidates for admission to the first year D.M Post-graduate Higher Specialty Degree Courses shall be required to have any one of the following qualifications as detailed

		<u>D.M Qualification requirement</u>
Branch	1	M.D
(Medicine)	Neurology	
		M.D (Paediatrics)

## **DURATION OF THE COURSE**

- a) The duration of certified study and training for the D.M Post Graduate Higher Specialty Degree Courses shall be three completed years (including the period of examination) (i.e. completed six academic terms of six months each after obtaining MD degree or equivalent recognized qualification in the required subject.)
- b) No exemption shall be given from this period of study and training for any other experience gained prior to the admission of the course.

## **DURATION OF COMPLETION OF THE COURSE**

The duration for completion of the course is double the duration of the course (i.e) 6/10 years (as the case may be) to pass the examination, from the date of joining the course; otherwise he/she has to get fresh admission.

## **CUT-OFF DATES FOR ADMISSION**

To be decided by the University

## **COMMENCEMENT OF THE COURSE**

To be decided by the University

## **REGISTRATION OF CANDIDATES**

A candidate admitted in D.M Post graduate Higher Specialty degree course in Amrita Institute of Medical Sciences, shall register his/her name in Amrita Vishwa Vidyapeetham by submitting the prescribed application form for Registration duly filled in all respects along with the prescribed fee and a declaration form to the Academic Officer of this University through the Head of the affiliated Institutions within 60 days from the cut-off date prescribed for admission.

## **COMMENCEMENT OF EXAMINATIONS**

To be decided by the University

## **ATTENDANCE REQUIREMENTS FOR ADMISSION TO EXAMINATION**

No candidate shall be permitted to appear for the examination unless he/she has put in a minimum of 80% attendance during hi/her period of study and training in Amrita Institute of Medical Sciences and produces the necessary certificate of study, attendance and progress from the Head of the institution.

## **CONDONATION OF ATTENDANCE**

There shall be no condonation of lack of attendance for the course.

## **REVALUATION OF ANSWER PAPERS**

There shall be no revaluation of answer papers. However, retotalling is allowed in the failed subjects.

## **PRESENTATIONS OF PAPERS / PUBLICATIONS AND TEACHING**

- a. The D.M students should be made as part of their training Programme to present minimum of two papers in National Conference or minimum of one publication in a journal at National/International level.
- b. The D.M students should be encouraged to take classes for MD students on various clinical programmes.

## **NUMBER OF APPEARANCES**

Candidates who do not pass their final examination within three appearances shall undergo a further period of study and training of minimum 3 months duration for every subsequent appearance.

The candidate should submit a certificate of study and training undergone from the concerned Head of the Institution to the Controller of Examinations of this University along with his/her application for admission to every subsequent examination (applicable for candidates who have failed more than 3 times)

The failed candidates will be permitted to appear for a maximum of 6 attempts with 3 years from the date of completion of the course and shall be discharged from the course if he/she fails to fulfill this provision.

## **MAINTENANCE OF LOG BOOK**

- a) Every Post-graduate candidate shall maintain a record of skills he/she acquired during the training period certified by the various Heads of Departments where he/she has undergone training including outside the institution.
- b) The candidate should also be required to participate in the teaching and training programme of Post-graduate and intern students.
- c) In addition, the Heads of the Departments will involve their postgraduate candidates in Seminars, Journal Clubs, Group Discussions and participation in clinical, clinic pathological conferences.
- d) Every Post-graduate candidate should present short title papers in conferences and improve on it and submit them for publication in reputed medical journals.
- e) The head of the Department will scrutinize the Log Book every three months.
- f) At the end of the course, the candidate should summarize the contents and get the Log Book certified by the Head of the Department.
- g) The Log Book should be submitted at the time of practical examination for the scrutiny of the Board of Examiners.
- h) The Log Book should contain Journal Club details, Clinical Case presentations, Procedures assisted and done independently and papers published. These details should be mentioned date wise.

## **DISSERTATIONS**

- a) All candidates admitted to undergo D.M Post-graduate Higher Specialty Degree courses shall be assigned a topic for dissertation/thesis by the head of the concerned Unit and the title of the topics assigned to the candidates be intimated to the Controller of Examinations of this University by the Head of the Department

through the Head of the Institution, before end of the first year for 3 years course.

- b) The dissertation/thesis shall be a bound volume of minimum 50 pages and not exceeding 75 pages of typed matter (Double line spacing and on one side only) excluding certification, acknowledgements, annexures and Bibliography.
- c) 4 copies of dissertation shall be submitted six (6) months prior to the commencement of the examinations on the prescribed date to the Controller of Examinations of this University.
- d) Two copies are to be submitted as an electronic version of the entire dissertation in a standard CD format by mentioning the details and technicalities used in the CD format.
- e) The concerned Professors/Readers are to supervise and to see that the Dissertations are done properly utilizing the clinical materials of their own department/institution. The students must learn the design and interpretation of research studies, responsible use of informed consent and research methodology and interpretation of data and statistical analysis. They should seek the help of qualified staff members in the conduct of research. They must learn to use the library and computer based research. This training will help them to develop skills in planning, designing and conduct of research studies.

## **EVALUATION OF DISSERTATION**

- a) The dissertation should be approved by the Professor of that branch and the same has to be forwarded to the Controller of Examinations by the Head of the Department through the Dean/Principal of that college six months prior to practical examination and examined by a set of two examiners.
- b) No marks will be allotted for dissertation in DM Postgraduate Higher Specialty degree courses and the Board of Examiners should mark the dissertation either “Approved” or “Not Approved”.
- c) No grading should be given as “Good, “Very Good” or “Excellent” for the approved dissertation.
- d) Two copies of the evaluation report of the dissertation should be submitted by the Examiners to the Controller of Examinations of this University.



- e) If the dissertation is “Not Approved” or “Rejected” by the majority of the examiners the results shall be withheld till the resubmitted dissertation is approved.
- f) If the candidate fails in the written/practical examination but his/her dissertation is “Approved, the approval of the dissertation shall be carried over to the subsequent examinations.

## **SYLLABUS**

### **BRANCH-I-D.M. NEUROLOGY**

- Neuroanatomy: It includes anatomy of central and peripheral nervous system and muscles including microscopic appearance, relevant embryology and its application to the related developmental disorders.
- Neurophysiology – Physiology of central and peripheral nervous system and muscles.
- Neuro Biochemistry: The normal biochemistry of the nervous system and muscles; and its application in different neurological disorders.
- Neuropathology: Pathology of different diseases affecting the nervous system and muscles, including macroscopic and microscopic appearances.
- Neuro – bacterio – virology – with special reference to the various neurological Disorders.
- Neurogenetics: Normal as well as the abnormalities in different genetically inherited neurological disorders.
- Biostatistics and clinical epidemiology : Fundamentals of biostatistics, ability to conduct a clinical trial independently and interpret the final reports.
- Neuro immunology: Normal and various abnormalities, seen in neuro Immunological disorders.
- Neuropsychiatry: Related neuropsychiatric disorders such as nonepileptic seizure etc.
- Neuro Psychology.
- Pediatric Neurology.
- Neuro radiology including plain X-ray, CT scan, Angiogram, Magnetic Resonance Imaging, Myelogram etc.
- Electrophysiology : Electrophysiology, nerve conduction studies, EEG including sleep EEG and Video EEG, evoked potentials etc.

- Other Neurology oriented investigatory procedures in relation to neurology/Neuro ophthalmology etc.
- Neurosurgery
- Clinical Neurology
- Neuro pharmacology of various neurological disorders.

### 1<sup>st</sup> Year

During the first year, the student will be working fully in the Department of Neurology. In the morning time, he/she will be familiarized with clinical neurology, neurological examination, localization and differential diagnosis, relevant laboratory and radiological investigations and pharmacotherapeutics. He/she will attend all the outpatient services and get himself/herself aware of the common neurological problems. In addition, he/she will work in the electrophysiology laboratories and get himself/herself fully familiar with EMG, evoked potential and electroencephalography (EEG). He/she should be competent to handle the equipments and report independently. In the afternoon, he/she will concentrate on the basic sciences and will undertake the research study within 3 months after admission.

### 2<sup>nd</sup> year

The candidate may be sent to the best centre for training and learning the following subjects; This comes under 'visit to other centres'. The total period is for three months or four months depending on the centre.

**Following will be the subject and duration of training: -**

<b>Subject</b>	<b>Duration of Training</b>
Neuropathology	15 days
Neuro-radiology ( including interventional radiology)	15 days
Intensive Care in Neurology	30 days
Psychiatry	15 days
Neurosurgery	30 days
Electrophysiology	60 days
Neurorehabilitation	15 days
<b>Total</b>	<b>6 months</b>

### **3<sup>rd</sup> YEAR**

During the period, the candidate will work in the Neurology department concentrating on clinical and theoretical neurology, clinical psychiatric relevant investigations and medical as well as paramedical management of the patients. Besides, he shall handle and report the EEG and EMG by himself.

Examination will be conducted at the end of third year.

### **Courses**

#### **Course I Basic Sciences (Code DMNU1)**

CO1: Knowledge of Neuro anatomy, including anatomy of central and peripheral nervous system and muscles including microscopic appearance, relevant embryology and its application to the related developmental disorders.

CO2: Knowledge of Neuro physiology, including physiology of central and peripheral nervous system and muscles.

CO3: Knowledge of Neurochemistry, including the normal biochemistry of the nervous system and muscles; and its application in different neurological disorders.

CO4: Knowledge of Neuropathology, including pathology of different diseases affecting the nervous system and muscles, including macroscopic and microscopic appearances.

CO5: Knowledge of Microbiology & Parasitology with special reference to with special reference to the various neurological Disorders. Knowledge of Neuro immunology: Normal and various abnormalities, seen in neuro Immunological disorders.

CO6: Knowledge of Biostatistics and clinical epidemiology : Fundamentals of biostatistics, ability to conduct a clinical trial independently and interpret the final reports.

CO7: Knowledge of Genetics as applicable in the practice of neurology with special reference to the normal as well as the abnormalities in different genetically inherited neurological disorders.

**Neuroanatomy:** It includes anatomy of central and peripheral nervous system and muscles including microscopic appearance, relevant embryology and its application to the related developmental disorders.

**Neurophysiology – Physiology of central and peripheral nervous system and muscles.**

Neuro Biochemistry: The normal biochemistry of the nervous system and muscles; and its application in different neurological disorders.

Neuropathology: Pathology of different diseases affecting the nervous system and muscles, including macroscopic and microscopic appearances.

**Neuro – bacterio – virology** – with special reference to the various neurological Disorders.

**Neurogenetics:** Normal as well as the abnormalities in different genetically inherited neurological disorders.

**Biostatistics and clinical epidemiology :** Fundamentals of biostatistics, ability to conduct a clinical trial independently and interpret the final reports.

**Course II Neuroradiology, Electrophysiology, Neurootology, Neuroophthalmology and other investigative Procedures. (DMNU2)**

CO1: Knowledge of neuro Radiology, as applicable in the practice of neurology.

CO2: Knowledge of electro Physiology, as applicable in the practice of neurology.

CO3: Expertise in neuro Otology as applicable in the practice of neurology.

CO4: Knowledge of neuro Ophthalmology as applicable in the practice of neurology.

CO5: Expertise in investigatory procedures as applicable in the practice of neurology. Such as Neuro radiology including plain X-ray, CT scan, Angiogram, Magnetic Resonance Imaging, Myelogram etc.

Electrophysiology : Electrophysiology, nerve conduction studies, EEG including sleep EEG and Video EEG, evoked potentials etc. & Neurology oriented investigatory procedures in relation to neurology/Neuro ophthalmology etc.

**Neuro radiology including plain X-ray, CT scan, Angiogram, Magnetic Resonance Imaging, Myelogram etc.**

**Phakomatosis**

**Electrophysiology :** Electrophysiology, nerve conduction studies, EEG including sleep EEG and Video EEG, evoked potentials etc.

**Electromyography and its applications**

**Other Neurology oriented investigatory procedures in relation to neurology/Neuro ophthalmology etc.**

**Indications of Brain biopsy**

**Course III Neurology, Neuropsychiatry, Neuropsychology, Paediatric Neurology (DMNU3)**

CO1: Knowledge of Neuro Psychiatry (related neuropsychiatric disorders such as nonepileptic seizure etc) as applicable in the practice of neurology.

CO2: Knowledge of neuro psychology as applicable in the practice of neurology.

CO3: Knowledge of pediatric neurology as applicable in the practice of neurology.

CO4: Knowledge of neurosurgery as applicable in the practice of neurology.

CO5: Expertise in clinical neurology and neuro pharmacology of various neurological disorders.

**Neuropsychiatry:** Related neuropsychiatric disorders

**Differentiation of autoimmune encephalopathy from psychiatric diseases**

**Neuro Psychology application**

**Management of pediatric case in neurology**

**Low Glasgow Coma Scale in Pediatric age group**

Neurosurgery and its application

Clinical Neurology

Neurologic manifestations of various systemic diseases

**Neuro pharmacology of various neurological disorders.**

**Course IV Recent advances in Neurology (DMNU4)**

CO1: Updated knowledge of technologies and instrumentations used in Neurology

CO2: Updated knowledge on the drugs used in the practice of neurology

CO3: Knowledge about the recent published research papers in neurology.

**Knowledge about latest instruments , treatment modalities in the international setting as well as knowledge of recent /prestigious research papers**

**Soft Skills (DMNU5) – Elective Course**

CO1: Competency to conduct a clinical research.

CO2: Acquisition of pedagogical skills for students (MBBS, Specialities)

CO3: Ability to work as a member of a healthcare team.

CO4: Communication skills with patients, caregivers and colleagues including non medical staff and an understanding of economics in cardiovascular management.

CO5: Attitude to be a lifelong learner.

**Research Study : -**

All candidates during the first year within three months of admission into the D.M. Post Graduate Higher specialty degree course shall be assigned a topic for dissertation by the Head of Neurology Department in consultation with the concerned Unit Chief. The title of the topics assigned to the candidates should be intimated to the Controller of Examinations of the University by the Head of the Department through the Head of the Institution before the end of first year. Four copies of dissertation shall be submitted five months prior to the commencement of examination, as in the prescribed date to the controller of Examinations of the University.

**Branch-I - D.M Neurology**

<b>Theory- 4 papers</b>	<b>100 Marks each Duration:</b>	<b>Three Hours each</b>
Paper I	Basic Science – consisting of Neuro anatomy, Neuro physiology, Neurochemistry, Neuropathology, Neuro Microbiology, Parasitology, Immunology, Epidemiology and Genetics.	100
Paper II	Neuro Radiology, Electro Physiology, Neuro Otology, Neuro Ophthalmology and other investigatory procedures	100
Paper III	Neurology, Neuro Psychiatry, Neuro Psychology, Paediatric Neurology.	100
Paper IV	Recent advances in Neurology	100

**DISTRIBUTION OF MARKS**

One Essay 20 Marks

Two Essays 15 Marks each (15x2) 30 Marks

Five Short notes 10 Marks each (10x5) 50 Marks

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**TOTAL**

**100 Marks**

**PRACTICAL /CLINICAL AND ORAL EXAMINATION**

	<b>NO OF CASES</b>	<b>DURATION</b>	<b>MARKS</b>
<b>LONG CASE</b>	One	One Hour	150
<b>SHORT CASE</b>	Two	One Hour (30 mts. Each)	75 x 2
		<b>Total</b>	300
<b>Oral / Viva Examination</b>			100
		<b>TOTAL</b>	<b><u>400</u></b>

The Viva includes Pathology slides, specimens, EEG, EMG and other diagnostic records, x-ray, CT scan, MRI, Angiogram and others.

**Note:** Not more than three candidates will be examined in Practical examinations per day.

**DISSERTATION:** Approved/Not approved (No Marks)

**MARKS QUALIFYING FOR A PASS:**

	<b>Maximum Marks</b>	<b>Marks Qualifying for a pass (50%)</b>
Theory	400	200
Practical/Clinical	200	100
Oral	100	50
<b>Aggregate</b>	<b>700</b>	<b>350</b>

The Viva and Clinical Examination may be conducted on the same day, because all the candidates need not have to be present till the last day of examination.

**Recommended Reading: -**

Books and Journals as per the advice of the Head of the Department of Neurology.

Sample question paper

Reference books

Journals