REGULATIONS AND CURRICULUM GOVERNING

M.Sc. NEUROSCIENCE PROGRAM

Implemented in Academic Year 2022-23

Name of the Constituent Unit/Centre: YENEPOYA SCHOOL OF ALLIED HEALTH SCIENCES



Deralakatte, Mangalore, Karnataka

NOTIFICATION FROM THE UNIVERSITY

Sl. No.	ACM with date	Decisions/Approvals
1.	47th ACM/ 20.06.2022	Approval of starting the MSc. Neurosciences under the Yenepoya School of Allied Health Sciences from the Academic year 2022-2023 onwards
2.	49th ACM/ 13.12.2022	Curriculum of B.Sc. –M.Sc. Integrated UG –PG programme with NEP regulations has been approved for implementation from the Academic Year 2022-23.
3.	51st ACM/ 16.05.2023	Approval of CBCS regulations: Form CIA 40% and SEE 60% to CIA 50% and SEE 50%. Minimum pass marks for CIA shall be 50% and SEE shall be 50%
4.	58th ACM/ 13.08.2024	Approved the amendment of the dissertation credit distribution from 6 credits to 12 credits.
5.	63rd ACM/ 13.05.2025	Approved the amendment on Structured continuous internal assessment components of PG dissertation

YENEPOYA
(DEEMED TO BE UNIVERSITY)

TABLE OF CONTENTS

Sl.No.	Particulars	Page numbers
1.	Preamble	1
2.	Definitions	1
3.	Eligibility for Admission	4
4.	Duration of the Program	5
5.	Maximum Period for Completion of the Program	5
6.	Aim of the Program	5
7.	Outcomes of the Program • Program Outcomes	6
8.	• Program Structure	9
9.	Attendance	8
10.	Teaching-Learning Methods Course wise	8
11.	Scheme of Examination	11
12.	Eligibility to appear for University Examination	11
13.	Criteria for Passing	12
14.	Grading and Classification	11–12
15.	Declaration of Class	14–29
16.	Journals	30–44
17.	Any other information	45–50
18.	Syllabus	50-54

1. Preamble

Health care sector has become one of the largest employment generation sectors in India and abroad. Rapidly changing and expanding horizon of the health care sector demands formal training programs in all its Allied areas. Postgraduate Program in Allied Health sciences specialty often encompasses a wide range of disciplines. The learning during post-graduation is usually heavily research focused. Professionals in the medical field rely heavily on modern technology to successfully treat, diagnose, and care for patients. By doing post-graduation in Allied health disciplines one will be preparing for a career as an educator, researcher, or technologist. Students may find a variety of options upon completion of post-graduation such as managing the Optical, hospital etc. They can also join as teachers in the faculty of Allied and health professionals. They can also do research pursue doctorate in their field of interest. They can also join biomedical equipment manufacturing company and pharmaceutical company as experts in their field.

The post-graduation in Neuroscience will prepare the candidate for a career as researcher, or therapist. Students may find a variety of options upon completion of post-graduation. Academic and Research pursuit are other areas that offer opportunities for professional growth and development. The scope of growth in the field is tremendous with the improving healthcare system. To match our education system with the international educational pattern all the post-graduate programs are with Choice Based Credit System.

2. Definitions

2.1. Academic Year:

Two consecutive (one odd + one even) semesters constitute one academic year.

2.2. Choice Based Credit System:

The CBCS provides choice for students to select from the prescribed courses (core, elective or minor or soft skill courses).

2.3. Course:

Usually referred to, as ‘papers‟ is a component of a program. The courses shall define learning objectives and learning outcomes. A course shall comprise lectures/tutorials/laboratorywork/fieldwork/outreachactivities/projectwork/vocationaltraining/viva/seminars/termpapers/assignments/presentations/self-studyetc.oracombination of some of these.

2.4. Credits:

Credit defines the quantum of contents/syllabus prescribed for a course and determines the number of hours of instruction required per week. Thus ,normally in each of the courses, credits will be assigned on the basis of the number of lectures/tutorial laboratory work and other forms of learning required, to complete the course contents minimum of 15-weekschedule:Onecredit=1hour of lecture per week/two hours of Laboratory or practical/three hours of clinical rotation, field work/posting. All courses need not carry the same credits.

2.5.Programs:

An educational program leading to award of a degree, diploma or certificate.

2.6.Grade Point:

It is a numerical weight allotted to each letter grade on a10-pointscale.

2.7.Credit Point:

It is the product of grade point and number of credits for a course.

2.8.Cumulative Grade Point Average (CGPA):

It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to two decimal places.

2.9. Letter Grade:

It is an index of the performance of students in a said course. Grades are denoted by letters: O+, O, A+, A, B+, P, F.

2.10. Semester Grade Point Average (SGPA):

It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to two decimal places.

2.11. Transcript or Grade Card or Certificate:

Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester.

Type of Courses

2.12. Core course:

A course that should compulsorily be studied by a candidate as a core requirement is termed as a core course. This is the core requirement to complete the M.Sc. Renal Dialysis Technology Program.

2.13. Skill Enhancement Course:

These courses are aimed at improving practical, professional & procedural knowledge requirement for carrying the highly skilled task related to the field of study.

2.14. Multidisciplinary Elective:

Generally, a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/subject of study or which provides an extended scope or which enables an exposure to some other discipline or subject or domain or nurtures the candidate's proficiency skill.

A candidate shall have the freedom to choose Multidisciplinary Elective courses during the academic duration of the particular PG Program offered by Yenepoya (deemed to be) University through the PG departments or SWAYAM/MOOC external online platforms or a mix of courses offered by Yenepoya(deemed to be) University and SWAYAM/MOOC as appropriate.

i. A candidate opting for SWAYAM/MOOC courses shall have the freedom to choose the courses of once own choice and complete such courses before appearing fourth Semester End Examination.
ii. A candidate shall compulsorily submit the pass certificate of each course successfully completed to the controller of examination of Yenepoya (deemed to be) University through the proper channel before appearing the fourth semester end examination.
iii. A candidate opting multidisciplinary elective courses offered by the Yenepoya (deemed to be) University through the PG departments need to take up these courses generally during second and third semesters of the program.

iv. A candidate shall not take the courses offered by the department in which she/he is enrolled.

v. Registration for the multidisciplinary elective courses offered by the Yenepoya (deemed to be) University shall be at least one week prior to the commencement of the course with the CBCS coordinator. The CBCS unit shall notify the list of courses after being approved by the respective BOS. For SWAYAM/MOOC courses shall be as per the enrollment notification by the respective implementation authorities.

Yenepoya (deemed to be) University shall adapt the regulations of UGC governing SWAYAM/MOOC courses as amended from time to time.

3. Eligibility for Admission

To be eligible for admission a candidate shall have obtained a bachelor degree (B.Sc. Renal Dialysis Technology) from University established under law considered equivalent by thereto by Yenepoya (Deemed to be University). The candidate shall have obtained minimum of 50% aggregate of marks in all the years of University examination of degree course.

In case of SC/ST/OBC candidates the minimum marks shall be 45%.

4. Duration of the Program

The duration of the program shall extend over 4 semesters (2 academic years) of 15 weeks or more each with a minimum of 90 actual working days of instructions in each semester and 2 – 3 weeks of examinations. The successful completion will lead to Masters' degree in Renal Dialysis Technology.

Semester

An academic year shall consist of two semesters;

OddSemester1st&3rd	September/October to February/March
Evensemester2nd&4th	March/April to August/September

5. Maximum period for completion of the Program

Candidate shall complete the four semesters (two years) program within four years from the date of admission.

6. Aim of the Programme

The aim of the M.Sc. Neuroscience Technology program is to prepare competent, ethically responsible, and research-oriented neuroscience technologists with advanced knowledge and skills in neurodiagnostic and neurotherapeutic procedures. The program seeks to develop graduates who can deliver safe, evidence-based, and patient-centred neurological care; perform, manage, and maintain advanced neurodiagnostic technologies such as EEG, EMG, nerve conduction studies, evoked potentials, and neuroimaging support systems; contribute to quality assurance, patient safety, and infection control practices; actively participate in clinical research and innovation in neuroscience; and assume leadership, teaching, and supervisory roles in neurodiagnostic laboratories, hospitals, academic institutions, and healthcare organizations.

7. Outcomes of the Programme

Upon successful completion of the Master'sprogramme, Students gain Knowledgein student centred learning methods in providing basic to advanced level of knowledge in all disciplines of neuroscience, facilitate practical and clinical exposures for skill training and develop key attitude for professional neurological practice. In particular they will:

PO 1: Enhance knowledge from clinical experience, interactions & discussions and research to improve the quality of training and education in Neuroscience. (K,S)

PO 2: Explore a specialized field in depth and develop high degree of expertise to contribute to advancement of knowledge in Neuroscience. (K,S)

PO 3: Develop teaching and presentation skills necessary to become efficient teachers utilizing state-of-the art facilities. (K,S)

PO 4: Build up leadership qualities in education, practice and administration. (K,A,C)

Expected skill to be acquired by the end of the programme:

PO 7. Understand and learn how to use digital EEG including the appropriate use of montage. (K, S)

Reformatting. Learn to interpret adult interictal EEGs. Know the clinical significance of inter-ictal EEG. (K, S)

PO 8. In the neurophysiology lab, assist neurologists in Electromyography (EMG) procedures &amp in Nerve conduction studies (NCV) – procedures to be performed independently and basic interpretation of the findings. (K, S)

PO 9. Know the differential diagnosis of seizure disorders. Learn to diagnose & classify seizure disorders (K, S)

PO 10. Develop a strong knowledge base in neuroanatomy, physiology and pathophysiology as well as pharmacology, fetal and neonatal brain development and neuroscience. (K, S)

PO 11. Improve ability to understand and accept diversity in cultures, lifestyles and coping strategies among their patients, and learn to communicate within the patient's mode of understanding, with a focus on improving overall quality of life for each patient. (K, S, C ,A)

PO 12. Theoretical, technical and basic knowledge of procedures like Visual Evoked Potential (VEP), Somatosensory Evoked Potential (SSEP), Brainstem Auditory Evoked Response (BAER). (K, S)

PO 13. Conduct the various clinical and technical tests in the autonomic lab. Hands-on training in the sleep lab – patient instructions, clinical interpretations, sleep staging based on Epworth's scale and procedure skills in Polysomnography (PSG) to be acquired. (K, S, C)

PO 14. They are taught to demonstrate knowledge and practice of basic patient care and to coordinate with other members of the team Protect and uphold the rights of the patient, Ethical and legal issues and responsibilities and to Maintain professional confidentiality (K, S, C, A)

Program Structure:

	Broad category of course	Hours/Credits	Course
1.	**Discipline-Specific Courses**		
a)	Theory	**I Semester**	
		45Hours / 4 Credits	Neuroanatomy
		45 Hours / 4 Credits	Neurophysiology
		45 Hours / 3 Credits	Biostatistics & Research Methodology
		II Semester	
		45 Hours / 3 Credits	Neuropathology & Neuroimmunology
		45 Hours / 3 Credits	Neuropharmacology
		45 Hours / 3 Credits	Bioethics
		III Semester	
		45 Hours / 3 Credits	Neurology
		45 Hours / 3 Credits	Neurosurgery
		45 Hours / 3 Credits	Neuropsychology
		45 Hours / 3 Credits	Health Care Management
		IV Semester	
		45 Hours / 3 Credits	Neurology II
		45 Hours / 3 Credits	Neurorehabilitation
2.	**Discipline-Specific Courses**		
b)	Practical (SEC)*	**I Semester**	
		120 Hours /4 Credits	Neuroscience clinical skills I (Practical I & II)
		II Semester	
		120 Hours /4 Credits	Neuroscience clinical skills II (Practical I & II)
		III Semester	
		120 Hours /4 Credits	Neuroscience clinical skills III (Practical I)
		IV Semester	
		120 Hours /4 Credits	Neuroscience clinical skills

	Broad category of course	Hours/Credits	Course
			IV (Practical I)
c)	Clinical (SEC)*	**I Semester**	
		180 Hours /5 Credits	Neuroscience clinical skills I (Practical III)
		II Semester	
		180 Hours /4 Credits	Neuroscience clinical skills II (Practical III)
		III Semester	
		180 Hours /4 Credits	Neuroscience clinical skills III (Practical II)
		IV Semester	
		180 Hours /4 Credits	Neuroscience clinical skills IV (Practical II)
3.	**Curriculum Enrichment Courses**		
a)	Research Project	12 credits	Dissertation
4.	**Electives**		
a)	Interdisciplinary Courses	90 Hours/6 Credits	Coursera/Swayam
	Total	**92 Credits**	

8. Attendance

8.1. Each course (theory, practical, clinical etc.) shall be treated as an independent unit for the purpose of attendance. Candidates having minimum 80% attendance in each of the Courses can only qualify to appear for the Semester End Examination. The Candidates with less than 80% of attendance shall be required to repeat that Course by attending the semester.

8.2. There shall be no provision for condonation of shortage of attendance.

8.3. For SWAYAM/MOOC/NPTEL it shall be as per the regulations governing the courses of implementing authority.

8.4. The HOD/Course Coordinator through the Dean of Faculties shall announce the names of the candidates who will not be eligible to take the Semester End-Examinations (SEE) in the various courses and send a copy of the same to the Controller of Examinations (COE) Office. Registrations of such candidates for those courses shall be treated as cancelled.

9. Teaching - Learning methods course-wise

Teaching - Learning method	**Courses**
Experiential learning	Neuroscience Clinical skills I - IV
Integrated/Inter-disciplinary learning	Bioethics, Healthcare Management,
Participatory learning	Bioethics, Healthcare Management, Neurosurgery, Neuropsychology, Neuro Rehabilitation, Neurology
Problem-solving methodologies	Bioethics, Healthcare Management,
Self-directed learning	Coursera / SWAYAM, Neuroanatomy Neurophysiology
Patient-centric and Evidence-based learning	Neurogenetics & Molecular Biology, Neuropathology and Neuroimmunology, Neuropharmacology, Neuroscience Clinical skills I – IV.
The Humanities	Bioethics, Neuropsychology, Healthcare Management
Project-based learning	Dissertation, Biostatistics & Research Methodology

10. Scheme of Examination

10.1. Continuous Internal assessment format (distribution of marks)

Continuous Internal assessment components	Maximum marks
Average of two IA tests	20
Case Studies/Seminar/Assignments/Quizzes etc.	30
Total marks	50

10.2. Question Paper Pattern

Subjects having maximum marks = 50				Duration
Type of question	**Number of questions**	**Marks for each question**	**Total**	
Long essay type	02	15	30	150 min
Short essay Type	02	10	20	
Total			50	

10.3. Practical Examination

SI.NO	Components	Marks
1	Spotters	10
2	Case Scenario/OSCE/OSPE	20
3	Viva Voce	20
Total Marks		50

10.4. Particulars of practical, viva-voce & dissertation

10.4.1. Practical examination will be aimed at examination of clinical skills and competence of the candidates for undertaking independent work as a specialist.

10.4.2. Viva-Voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence &oral communication skills.

10.4.3. Special emphasis shall be given to dissertation work during the M. Sc .Neuroscience 2nd Year examination.

10.4.4. The marks of Viva-Voce examination shall be included in the clinical examination to calculate the percentage and declaration of results.

10.4.5. OSCE/OSPE-shall have minimum of 5 stations.

10.5. Evaluation and Certification of online courses:

10.5.1. Evaluation will be based on predefined norms and parameters and announced in the overview of the Course at the time of offering the course. Formative continuous online assessments and end of course proctored exams shall be completed by the student.

10.5.2. The certificate obtained shall be submitted to the college office which will be communicated to the office of the Controller of Examinations of Yenepoya (Deemed to be University).

10.5.3. The Yenepoya (Deemed to be) University will give the equivalent credit weightage to the students for the credits earned through online learning courses through MOOCS/Coursera as per the credit plan of the program.

10.6. Credit Mobility of Online Courses:

10.6.1. The Yenepoya (Deemed to be University) will give the equivalent credit weightage to the students for the credits earned through online learning courses as per the credit plan of the program.

10.6.2. In case a student fails to complete the online course he/ she may be allowed to complete the course requirements by registering for another online course in subsequent semester or opt for a course offered at Yenepoya (Deemed to be University), provided such a course is offered during that semester.

10.6.3. The elective course offered by the Yenepoya (Deemed to be University) shall be restricted to a maximum of 3 credits.

10.6.4. A candidate shall compulsorily complete total 6 Credits of Multidisciplinary courses.

10.6.5. These courses shall be selected either from the Generic Electives offered by the Yenepoya (Deemed to be) university or from the SWAYAM/Coursera courses. A Candidate shall have freedom to choose the courses of once own choice and learn at their own pace but, require to complete minimum 3 credits before second semester and 6 credits before third semester SEE.

10.6.6. A candidate who wishes to earn additional credits may be permitted to do so during the academic duration.

10.7. Continuous Internal Assessment Components of PG Dissertation

<table>
<tr><th>Sl. No</th><th>Parameters</th><th></th><th>Marks</th></tr>
<tr><td>1.</td><td colspan="2">Maintaining the timeline</td><td>10</td></tr>
<tr><td rowspan="4">2.</td><td colspan="2">Presentation a Conference /CME/Publication (student can choose any of the criteria to avail 40 marks)</td><td rowspan="4">40</td></tr>
<tr><td>Criteria</td><td>Marks Allocated</td></tr>
<tr><td>Online Oral/Online Poster/Offline Poster presentation/Conference proceeding publications in Scopus/WoS indexed
journals/Publication of Copyright</td><td>20</td></tr>
<tr><td>Offline oral presentation at National/International Conference/Patents/Publication of Review Paper/Pilot Study/Study
Protocol in Indexed Journal</td><td>40</td></tr>
<tr><td>3.</td><td colspan="2">Manuscript submission (Based on the dissertation) to the Indexed journals (SCOPUS/WoS) along with submission
of final dissertation</td><td>50</td></tr>
<tr><td></td><td colspan="2">Total</td><td>100</td></tr>
</table>

10.8. Assessment of Research project

A declaration by the candidate that the work was done by him/her shall be included. The guide, Head of the Department and Head of the Institution shall certify the bonafide of the project.

Total 200 marks shall be awarded for the research project and the marks distribution as follows:

- 100 marks – Dissertation evaluation by Internal and External examiners
- 100 marks – Continuous Internal Assessment

10.9. Evaluation of Dissertation

10.9.1. Dissertation shall be evaluated by two examiners, one external & one Internal for 100 marks from the panel of examiners approved by the Board of Studies and by the University.

10.9.2. The criteria for the evaluation shall be as prescribed by the Board of Studies.

10.9.3. Acceptance of the dissertation is a pre-requisite for a candidate to be eligible to appear in the final examination.

10.10. Guide:

10.10.1. The academic qualification and teaching experience required for recognition of guide shall be as given under:

10.10.2. DM in Nephrology with 2 years of teaching experience after MD/DM programme or Ph.D in Renal Dialysis or M.Sc. Renal Dialysis Technology with teaching experience of four years after the Masters programme.

10.10.3. Student guide ratio: A recognized guide shall supervise dissertation work of not more than five students per academic year. The age of the guide shall not exceed 65 years.

10.10.4. Co-Guide may be included provided the work requires substantial contribution from a sister department, another institution recognized for teaching in Yenepoya (Deemed to be University), or any other State level University.

10.11. Change of Guide:

In the event of registered guide leaving the Institute/ college due to any reason or in the event of death or any other valid reasons, guide can be changed with prior permission from the University only.

11. Eligibility to appear for University Examination

11.1. Each course (theory, practical, clinical etc.) shall be treated as an independent unit for the purpose of attendance. Candidates having minimum 80% attendance in each of the Courses can only qualify to appear for the Semester End Examination. The Candidates with less than 80% of attendance shall be required to repeat that Course by attending the semester. There shall be no provision for condonation of shortage of attendance.

11.2. Evaluation of a course shall be done based on continuous internal assessment (CIA) mode followed by semester end university examination (SEE) for each course.

11.3. The components of CIA (Continuous Internal Assessment) may include sessional tests, Seminar/ Journal Club/ Case Studies /Assignment and other activities as determined by the board of studies in the respective departments.

11.4. The CIA:SEE percentage is 50:50 and minimum marks for CIA shall be 50% and SEE shall be 50%.

11.5. The pass marks per course shall be 50% There shall be examinations at the end of each semester ordinarily during February/March for odd semesters and August/September for even semesters

11.6. The SEE duration shall be two and half hours.

12. Criteria for passing

12.1. The CIA:SEE percentage is 50:50 and minimum marks for CIA shall be 50% and SEE shall be 50%.

12.2. The pass marks per course shall be 50%

12.3. A candidate shall be declared to have passed the PG program if he/she secures atleast CGPA of 5.0 (Course Alpha-Sign Grade P) in the aggregate of both internal assessment and semester end examination marks.

12.4. The candidates who pass all the semester examinations in the first attempts in Two years are eligible for ranks provided they secure at least a CGPA of 8.0 (atleast Alpha-Sign Grade A).

12.5. The results of the candidates who have passed the fourth semester examination but not passed the lower semester examinations shall be declared as NCL (Not Completed Lower semester examinations). Such candidates shall be eligible for the degree only after completion of all the lower semester examinations.

12.6. A candidate who passes the semester examinations in parts is eligible for only CGPA and Alpha-Sign Grade but not for ranking.

12.7. There shall be no minimum marks with respect to internal assessment and viva-voce marks.

12.8. A candidate who fails in any of the project work/project report/dissertation shall reappear for the same and pass the examination subsequently within the nearest semester and examination schedule.

13. Carry over provisions

Carry over shall be allowed to the candidates up to IV semesters.

14. Grading and Classification

The results of successful candidates at the end of each semester shall be declared in terms of Grade Point Average (GPA) and Alpha-Sign Grade. The results at the end of the sixth semester shall be classified on the basis of the Cumulative Grade Point Average (CGPA) obtained in all the four semesters and the corresponding overall alpha sign grade.

a. Letter Grades and Grade Points:

Letter Grade	Grade Point	Range of Marks
O+(Outstanding)	10	90–100
O(Excellent)	9	80–89.99
A+(Very Good)	8	70–79.99
A(Good)	7	60–69.99
B+(Average)	6	55–59.99
P(Pass)	5	50–54.99
F(Fail)	<5	<50

b. Cumulative Grade Point Average(CGPA):

The results at the end of the fourth semester shall be classified on the basis of CGPA obtained in the four semesters and the corresponding overall letter grade. The letter grade as described below shall be adopted.

Letter Grade	CGPA Range
O+(Outstanding)	9.0–10.0
O(Excellent)	8.0–8.99
A+(Very Good)	7.0–7.99
A(Good)	6.0–6.99
B+(Average)	5.5–5.99
P(Pass)	5.0–5.49
F(Fail)	<5.0

15. Journals

a. *Neurology India*. Official journal of the Neurological Society of India; covers EEG, EMG, NCS, epilepsy, neuromuscular disorders, and central nervous system disorders.
b. *Annals of Indian Academy of Neurology*. Focuses on clinical neurophysiology, neurological disorders, and evidence-based neurological practice.
c. *Indian Journal of Neurotrauma*. Publishes work related to neuro-monitoring, evoked potentials, and intraoperative neurophysiology.
d. *Journal of Neuroanaesthesiology and Critical Care*. Covers intraoperative neurophysiological monitoring, EEG monitoring, and neurocritical care applications.

16. Syllabus

Semester I

Course Title: Neuroanatomy

Course: Core

Credits: 3 **Number of Hours: 45**

Course Outcomes:

After completing this course the students will be able:

a. To understand the general organization of the brain and its relation to functional and cognitive processes.

b. To understand the basic principles of neural development.

c. To enhance the student's overall understanding and appreciation of research in neuroscience.

d. To improve the student's practical laboratory skills.

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
1	5hrs	Neuroembryology Introduction Neural Tube and its subdivisions Neural Crest Development of Spinal Cord Development of Medulla Oblongata, Pons, Mid Brain, Cerebellum, Cerebral Hemisphere, Cerebral Cortex, Thalamus, Hypothalamus, Corpus Striatum, White matter of Cerebrum, Autonomic Nervous system. Anomalies of Brain and Spinal Cord 9. Development of Pituitary Pineal & Adrenal Gland	√			20%	SE

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
2	7hrs	Basic Organization of central nervous system Introduction Meninges and Cerebrospinal Fluid Blood supply of the Brain Basic organization of Nervous Tissue Including Peripheral Nerve Endings	√			15%	SE
3	10hrs	Spinal cord Spinal Cord - structure Tracts of spinal cord Spinal nerves Blood supply of spinal cord	√			20%	LE,SE
4	7hrs	Brainstem Medulla Midbrain Pons Cranial nerves – Functional components and IV ventricle	√			10%	LE,SE
5	6hrs	Cerebellum		√		10%	SE,LE
6	10hrs	Forebrain Cerebrum Diencephalon White Matter of the Cerebrum Ventricles of Brain Reticular Formation	√			25%	LE,SE

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
		Rhinencephalon (Olfactory System) Limbic Lobe (Limbic System) Basal Nuclei of Cerebrum or Basal Ganglia Neural Pathways Autonomic Nervous System & Peripheral Nerve System Anatomical Basis of Clinical Conditions					

Reference Books:

- Singh V. *Textbook of Clinical Neuroanatomy*. 5th ed. Elsevier Health Sciences; 2024.
- Snell RS. *Clinical Neuroanatomy*. 8th ed. Lippincott Williams & Wilkins; 2021.

Course Title: Neurophysiology

Course: Core

Credits: 3 **Number of Hours: 45**

Course Outcomes:

a. After completing this course the students will be able To:

b. Understand and explain the various Neuro-physiological interaction and their functions in controlling the body activities.

c. Apply the gained knowledge in the field of Neuro-physiology

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
1	5hrs	Introduction to physiology: The cell and general physiology-Functional organization of the human body and control of the "Internal Environment"-Homeostasis-Regulation of body functions The cell and its function-Physical structure of the cell-Functional systems of the cell Genetic control of protein synthesis, cell function and cell reproduction-RNA-Cell differentiation	√			10%	SE

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
2	7hrs	Neuro-Endocrinology Introduction-Hormone-Important endocrine glands-hormone-chemistry of hormone-storage & secretion-hormone receptor – activation-mechanism of hormonal action-second messenger mechanism for mediated intracellular hormonal function-measurement of hormone concentration. Pituitary hormone & control by hypothalamus& relation-cell types –control-Hypothalamic hypo-physeal portal system-physiological function of growth hormone-effects-metabolic-stimulation of cartilage-bone growth-Regulation-growth hormone-abnormalities-Posterior pituitary gland-chemical nature-antidiuretic hormone-Function-vasopressin-oxytocin	√			15%	LE,SE
3	10hrs	Membrane physiology, Nerve and Muscle: Transport of Ions and molecules through the cell membrane-Diffusion –Active Transport Membrane potentials and Action potentials-The resting membrane potential of nerves-The nerve Action Potential-Voltage gated potassium & sodium channels-Initiation & Excitation-Contraction of skeletal muscles-	√			20%	LE,SE

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
		muscle fiber -muscle contraction-Excitation of skeletal muscle & Contraction-Neuromuscular transmission-contraction coupling-Contraction of smooth muscle-Regulation of contraction by calcium ions. General principles and sensory physiology Organization of the nervous system: Basic functions of synapses and transmitter substances General design of the nervous system-The central nervous system neuron-The basic functional unit-The sensory division of the nervous system-sensory receptors-The motor division-The effectors-Processing of information-integrative function-storage of information, memory-three major level of CNS functions-comparison of nervous system with the electronic computer-general nervous system of synapses-chemical substances that function as synaptic transmitters-electrical events during neuronal excitation-inhibition-special dendrites-function-special function in exciting neurons-relation of state of excitation to the rate of firing-special characteristic of synaptic transmission Sensory receptors: Neuronal circuits for processing information-Types of sensory receptors-sensory stimuli they					

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
		detect-differential sensitivity of receptors-transduction of sensory stimuli into nerve impulses-local currents in nerve endings0receptor potentials-adaptation of receptors-nerve fibers that transmits signals-physiological classification-Transmission of signals of different intensities in nerve tracts-spatial and temporal summation-Transmission and processing of signals in neuronal pools-Relaying of signals through neuronal pools-Prolongation of signal by a neuronal pool- After discharge-rhythmic signal output					
4	7hrs	Somatic sensations: General organizations: The tactile and position senses Classification of somatic senses-detection and transmission of tactile sensation-detection of vibration-Ticking and itch-two sensory pathways for transmission of somatic signals into the CNS-transmission in the dorsal column-leminiscal system-anatomy-somatic sensory cortex-somatic association areas-characteristics of signal transmission-analysis in the dorsal column-leminiscal system-psychic interpretation of sensory stimuli intensity-judgment-position senses-transmission in the anterolateral system-anatomy-special aspects of somatosensory functions	√			20%	LE,SE

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
		Somatic sensations: II. Pain, Headache, Thermal sensations. The Two types of pain-Fast-& Slow pain-Pain receptors-Stimulation-rate of tissue damage cause of pain-dual transmission of pain signal into the central nervous system-the pain control system-referred pain-visceral pain-cause-parietal pain caused by visceral damage-localization-visceral & parietal transmission pathways-clinical abnormalities-pain & other somatic sensations-Head ache-thermal sensations					
5	6hrs	Nervous system special senses: Vision-Physical principles of optics-Focal lengths of lens-Diopter-Optics of eye-camera-visual acuity-optical instruments-fluid system of eye-Intra ocular pressure-receptor & neural function of retina-anatomy & function of retina-Photochemistry of vision-Rhodopsin-retinal visual cycle-excitation of rods-photo chemistry of color vision of cones-light adaptation-color blind ness-neural circuitry of retina-central neurophysiology of vision-visual pathways-function of visual cortex-eye movements & control-Function of visual image-control of accommodation-autonomic control-pupillary diameter.		√		10%	SE

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
		Sense of Hearing-tympanic membrane-transmission of sound through bone- the cochlea-anatomy & function-organ of Corti-determination of loudness-central auditory mechanism-auditory pathway-function of cerebral cortex in hearing-hearing abnormalities-types of deafness Chemical senses –Taste & Smell: The sense of taste-bud & function-taste difference & control of diet-sense of smell-olfactory membrane-stimulation of olfactory cells-smell signals in to the central nervous system					
6	10hrs	Motor & Integrative of Neurophysiology: Motor function of spinal cord-Cord, reflexes-muscle receptors-muscle spindle-muscle stretch reflex,-voluntary motor activity-clinical application-Golgi tendon reflexes- organs in conjunction with motor control from higher levels of brain-flexors reflex-withdrawal reflex-crossed extensor reflexes-reciprocal inhibition & Innervation-posture & Locomotion-Scratch reflex-spinal cord reflex-autonomic reflex-spinal cord transection & spinal shock.	√			25%	LE,SE

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
		Cortical & Brain stem control of motor function-Cortico-spinal tract-transmission of signal from the motor cortex to the muscles-incoming fiber pathways-red nucleus-extra pyramidal system-excitation of spinal cord-cortex & red nucleus-reticular & vestibular nuclei-body against gravity-vestibular sensation-maintenance of equilibrium-vestibular apparatus-static equilibrium-detection of head rotation-vestibular mechanism for stabilizing the eye-subconscious stereo type movements Hypothalamus- Body temperature-Heat production & loss- role of hypothalamus- neuronal effector mechanism-body temp-Behavior control-local skin temperature-Fever-Exposure to cold. Cerebellum –the basal ganglia-over all motor control-cerebellum anatomy-function-neuronal circuit controlling movements-brain stem to control posture & equilibrium movements-voluntary muscle control –cerebellum-clinical abnormality-basal ganglia-& their motor functions-specific neurotransmitters- clinical syndrome-resulting their damage-indication of all the part of total motor control-what drives us to action					

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
		Cerebral cortex: Intellectual function of brain-Learning & memory-Physiologic anatomy of the cerebral cortex –functions of specific cortical areas-association-Wernicke's area-functions of brain & communication-corpus callosum-anterior commissure-transfer thoughts-memories-training & other information to the opposite hemisphere-memory-role of synaptic facilitation & synaptic inhibition-Immediate-short-long term memory- Behavioral & Motivation mechanism of brain & limbic system-Hypothalamus –activating driving system of the brain-Neuro-hormonal control of brain-Limbic system-functional anatomy-major out put pathway of the limbic system-vegetative & endocrine control-associated limbic structure-reward & punishment of function of the limbic system – rage-functions of amygdala hippocampus limbic cortex States of Brain activity-Sleep – brain waves- epilepsy-psychoses-Slow wave sleep- REM- basic theory –Physiological effects of sleep-origin in the brain waves – varying degree of cerebral activities- basic frequency of the electroencephalogram-EEG changes in the different stages of					

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
		wakefulness &sleep,Grandmal-petitmal-Focal epilepsy-psychotic behavior & Dementia-Role of specific neuro-transmitter systems Cerebral Blood flow-CSF-Brain metabolism cerebral blood flow-rate-regulation-microcirculation-CSF system-function-formation-circulation-absorbtion-pressure-obstruction to flow-CSF brain barrier-brain edema-brain metabolism Autonomic Nervous System: Adrenal medulla-General organization of ANS-Physiologic Anatomy of sympathetic nervous system-Parasympathetic Nervous system-Function-Characteristics-Cholinergic & Adrenergic fibers-Secretion of Acetyl choline-Norepinephrine-receptors of the effector organs-Excitatory & Inhibitory actions of sympathetic & Para sympathetic-stimulation & effects on specific organs-functions of adrenal medulla-sympathetic & parasympathetic tone –denervation hypersensitivity-autonomic reflexes-stimulation of discrete organs parasympathetic system-alarm & stress-medullary pontine mesencephalic control of ANS-parasympathetic postganglionic neurons					

Reference Books:

- Sembulingam K, Sembulingam P. *Essentials of Medical Physiology with Review of Medical Physiology*. 9th ed. Jaypee Brothers Medical Publishers; 2022.
- Misra UK, Kalita J. *Clinical Neurophysiology*. 4th ed. Elsevier India; 2019.

Course Title: Neurogenetics & Molecular Biology

Course: Core

Credits: 3 **Number of Hours: 45**

Course Outcomes:

After completing this course the students will be able:

a. To understand the structures and purposes of basic components of prokaryotic and eukaryotic cells and organelles.

b. To understand event sin cell division and mutations.

c. To understand basis of disorders with genetic causes related to nervous system

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
I	12Hrs	Introduction Structure and morphology in various types of cells - Biochemical composition - Cellular organelles - Composition and components of nucleus - Chromosomes - Cell division and Mechanics of cell division and regulation.Deoxy-ribo nucleic acids - ribonucleic acids - Functions of nucleic acids: replication, transcription, Genetic code, Translation - Post translation modification in protein synthesis Basis and inheritance of genetic disorders Mutation - Non-disjunction -	√			25%	LE,SE

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
2	10hrs	Chromosomal abnormalities - Chromosome behavior and inheritance pattern in man - Single gene Mendelian disorders: autosomal dominant, recessive, sex linked dominant and recessive - Polygeneic and mitochondrial inheritance.Types of mutations - Genetic variations and polymorphisms in genetic disorders	√				
3	15hrs	Clinical genetics Detection of chromosomal aberrations - Laboratory techniques used: Chromosome preparations, banding, DNA isolation and amplification - Genetic counseling - Concepts of Gene therapy-Totipotency - Pluoripotency- Stem cells sources – Isolation, cultivation and propagation of stem - Genetics of pluripotency- Genetic manipulation of embryonic stem cells - Recent experimental and clinical therapy using stem cells - Potentials and issues associated with stem cells.	√			25%	LE,SE
4	12hrs	Genetics of neuromuscular, bone and connective tissues disorders Skeletal muscle disorders - muscular dystrophy, inflammatory myopathies; Neuromuscular junction disorders - myasthenia gravis;	√			25%	LE,SE

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
		Peripheral nerve disorders- Charcot-Marie-Tooth disease; Motor neuron disorders - Spinal Muscular Atrophy; Genetically determined ataxias. Bone & Connective tissue disorders- Achnodroplasia, Osteogenesisimperfecta, Mucopolysaccharidoses.					

Reference Books:

- Gupta PK. *Genetics: Molecular and Evolutionary Principles*. 2nd ed. Rastogi Publications; 2018.
- Pawar KR, Desai AE, Deore BM. *Genetics and Molecular Biology*. 1st ed. Nirali Prakashan; 2020.

Course Title Research Methodology Biostatistics

Course: Core

Credits:3 **No. of Hours: 45**

Research Methodology

Course Outcomes:

After completing this course the students will be able:

a. To describe the types, need and process of research
b. To outline the process and purpose of literature review
c. To explain various biomedical research designs with advantages and disadvantages
d. To outline the process involved in data collection and analysis
e. To explain the components of research paper and process of publication.

CourseContent

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type of Question
Unit I	2hours	1.Introduction 1.1Needforresearch	√			10%	SE
		1.2Typesofresearch	√				
		1.3 Outlining the research process	√				
Unit II	2hours	2.ReviewofLiterature 2.1 Importance, sources & amp; steps	√			10%	SE
		2.2 Critical appraisal of research article	√				

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type of Question
Unit III	2hours	3.ResearchDesign 3.1 Types of research – Qualitative & Quantitative	√			10%	LE,SE
		3.2 Experimental &NonExperimental, Survey – advantages& Disadvantages	√				
Unit IV	2hours	4.ResearchProcess 4.1 Framing a researchquestion	√			15%	LE,SE
		4.2Researchtitle	√				
		4.3 Aim & Objectives, Assumptions, Limitations & Delimitations, Variables	√				
		4.4 Hypothesis – formation &testing	√				
Unit V	2hours	5. Data collection &analysis 5.1 Data sources, technique of data collection, tools	√			20%	LE,SE
		5.2Reliability&validity	√				
		5.3Processofdatacollection	√				
		5.4Pilotstudy– method,need	√				
Unit VI	2hours	6.Interpretation &presentationofdata 6.1 Qualitative &quantitativeanalysis	√			15%	LE,SE
		6.2 Graphical representation ofdata	√				

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type of Question
		6.3 Conclusion &discussion	√				
Unit VII	2hours	7. Discussion,Conclusion andReferences	√			10%	SE
Unit VIII	2hours	8.Essentials of writing a research paper along with process of publication	√			10%	LE

Course Title: Biostatistics

Credit: 3 **No. of hours: 45**

Course outcomes:

At the end of the Course, the students will be able to

a. Able to distinguish different data types,variables and scales of measurement
b. Able to organize, tabulate and present data through tables and graphs. Compute and interpret descriptive statistics
c. Able to compute and interpret sensitivity, specificity, PPV, NPV and ROC Analysis.
d. Able to determine sample size and use of random sampling methods.
e. Able to interpret Power of a test, Level of significance, p value and confidence interval. Use of t-test, ANOVA and m3ultiplecomparison.
f. To interpret the commonly used parametric and nonparametric tests and how to report the findings.
g. Carry out correlation analysis and interpret the results
h. Perform regression analysis and draw conclusions of the analysis. Use the regression model for predictions.

Course Content:

Unit	Hrs	Content	Must Know	Good toKnow	Desirable toKnow	Weightage	Type of Question
Unit I	**8hours**	**Introduction** Introduction to biostatistics & research methodology, types of variables & scales of measurements, measure of central tendency & dispersion, rate, ratio, proportion, incidence &prevalence	√			5%	**LE,SE**
Unit II	**4 hours**	**Sampling** Population & Sample, Sampling and non-sampling	√			10%	**LE,SE**

Unit	Hrs	Content	Must Know	Good toKnow	Desirable toKnow	Weightage	Type of Question
		errors and methods of minimizing these errors, Random and non-random sampling, different sampling techniques –simple random, stratified, systematic, cluster & multistage.					
Unit III	**5 hours**	**Sampling distributions** Parameter and Statistic. Standard error. Basic probability distributions - Normal, poisson, binomial distributions with their applications in biological sciences.	√			5%	**SE**
Unit IV	**10 hours**	**Tests of significance** Basics if testing of hypothesis – Null & Alternative hypothesis, type 1 and type II errors, level of significance (parametric) & power of the tests, p value, Confidence interval. Tests of significance – T test (paired &Unpaired), Chi square test & Test of proportion, One way analysis of variance repeated Measures analysis of variance. Tests of significance (non-	√			15%	**LE,SE**

Unit	Hrs	Content	Must Know	Good toKnow	Desirable toKnow	Weightage	Type of Question
		parametric) –Mann Whitney U Test, Wilcoxon Test, Kruskal Wallis Analysis ofvariance, Friedmann's Analysis of variance					
Unit V	**5 hours**	**Correlation and regression** Linear correlation by Karl Pearson and rank order correlation due to Spearman, Testing the significance of correlation coefficient, simple linear regression –estimation & testing, residual plots, multiple linear regression.	√			15%	**LE**
Unit VI	**2 hours**	**Sample size determination** General concept. Sample size for estimating means and proportion, testing of difference in means and proportions of two groups.	√			5%	**SE**

Unit	Hrs	Content	Must Know	Good toKnow	Desirable toKnow	Weightage	Type of Question
Unit VII	**2 hours**	**Study designs** Epidemiological methods – case series analysis and prevalence studies. Analytical epidemiological methods – Case control and cohort studies. Clinical trials / intervention studies, odds ratio and relative risk, stratified analysis	√			10%	**SE**
Unit VIII	**5 hours**	**Multivariate analysis** Concept of multivariate analysis, introduction to logistic regression and survival analysis	√			15%	**LE,SE**
Unit IX	**2hours**	**Reliability and validity of Diagnostic tests** Sensitivity, Specificity, Positive Predictive Value (PPV), Negative Predictive Value (NPV), ROC curve.	√			10%	**LE,SE**

Unit	Hrs	Content	Must Know	Good toKnow	Desirable toKnow	Weightage	Type of Question
Unit X	**2hours**	**Format of scientific documentations** Structure of research protocols, structure of thesis/ research report, formats of reporting in scientific journals. Systematic review And meta- analysis.	√			10%	**LE,SE**

Reference Books:

- RaoNSN: Applied statistics in health sciences,JPpublishers
- MahajanB.K:Methodsofbiostatistics,Kotharibookdepot,A.DMarg,Bombay
- PottiL.R:Atextbookofstatistics,Yamunapublications,Sreekanteshwaram,
- Trivandrum.
- Lancaster H.O: Introduction to medical statistics, Johnwiley &sons,NewYork.
- LeiusA.E: Biostatistics, Reinhold publishing Co, NewYork.
- CottonT: Statistics in medicine, Little Brown&Co, Boston.
- HillA.B:Principlesofmedicalstatistics,OxfordUniversitypress,NewYork

Course Title: Neuroscience Clinical Skills I

Practical I

Neuroanatomy

Course: Core

Credits: 4 **Number of Hours: 120**

Course Learning Objectives:

CO 01: This module aims to provide practical knowledge in identifying the structures and its clinical significance.

CLO 02: This module aims to provide practical knowledge in identifying the structures and its clinical significance.

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to know	Weightage
1.	120Hours	Identification of skull bones	√			10%
2.		Identify the sulcus and gyrus	√			10%
3.		Identifying structures of coronal, sagittal and horizontal plane session	√			10%

4.		Identification of the structures in the forebrain, midbrain and hindbrain.	√			10%
5.		Spinal cord – extent, coverings, modifications of dura and blood supply	√			10%

NEUROANATOMY

Spotters:

1) Identification of the structures in the forebrain, midbrain and hindbrain.

2) Spinal cord – extent, coverings, modifications of dura and blood supply.

Practical- II NEUROPHYSIOLOGY

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to know	Weightage
1	120Hours	Examination of Sensory System	√			**10%**
2		Examination of Motor System	√			10%
3		Examination of Reflexes	√			10%
4		Examination of cranial nerves I-VI	√			10%
5		Examination of cranial nerves VII-XII	√			10%

Course Outcomes:

After completing this course, you can be able to:

1) Identify the features of brain and spinal cord with its applied aspects
2) Development of nervous system and its anomalies with the aid of charts and models.
3) Identify the applied features of Sensory & Motor systems
4) To learn to perform the Neurological examinations

Reference Books:

1) Singh I. Textbook of Human Neuroanatomy (Fundamental and Clinical). 2009.
2) Singh V. Textbook of Clinical Neuroanatomy-E-Book. Elsevier Health Sciences; 2020 Sep 1.
3) Snell RS. Clinical Neuroanatomy. Lippincott Williams & Wilkins; 2010.
4) Guyton AC. Text book of medical physiology. China; 2006.
5) Grosvenor TP. Barret KE. Ganong; s Review of Medical Physiology. USA; 2010

Practical III (Clinical Rotation)

Credits: 4 **Number of Hours: 180**

Course Outcomes:

To understand Diagnosis, Clinical decision Making, Management and co management of anterior segment ocular diseases.

Course Content:

In this course students will be posted in various clinical settings of the Neurology OPD and the student will get experience in various aspects in diagnosis and management of various neurological conditions under the supervision of experienced professionals and is expected to work and contribute in the unit.

YENEPOYA
(DEEMED TO BE UNIVERSITY)

SEMESTER II

Course Title: Neuropathology & Neuroimmunology

Course: Core

Credits: 3 **Number of Hours: 45**

Course Outcomes:

After completing this course, you can be able to:

a. Explain about cell injury, events occurring in inflammation, thrombus and embolism
b. Describe neoplasia and list the common CNS tumours
c. Explain the mechanism, clinical features of cereberovascular disease, infections, demyelinatry and degenerative disorders

NEUROPATHOLOGY

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	e to Know	Weightage	Type Of Questions
1	6hrs	Cell injury, inflammation and hemodynamic disorders	√			12.5%	LE,SE
2	5hrs	Malformation and development disease	√			12.5%	LE,SE
3	5hrs	Neoplasia and CNS tumour	√			12.5%	LE,SE
4	5Hrs	Cerebrovascular disease	√			12.5%	LE,SE
5	6hrs	Infections, demyelinating and degenerative disease	√			12.5%	LE,SE
6	6hrs	Diseases of peripheral nerve and skeletal muscle	√			12.5%	LE,SE

NEUROIMMUNOLOGY

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
1	6hrs	**Unit I:** Cellular components of the immune system (B cells, T cells, Macrophages, Neutrophils and Monocytes), MHC complex (MHC class I & II and HLA antigen), Immune response (Humoral, Cell mediated and Tolerance) and learn & perform basic serological tests	√			12.5%	LE,SE
2	6hrs	**Unit II.** Autoimmunity Mechanism and CNS autoimmune diseases) and Tumor immunology (mechanism and immunologically mediated tumours.	√			12.5%	LE,SE

Reference Books:

- Perry A, Brat DJ. *Practical Surgical Neuropathology: A Diagnostic Approach*. 2nd ed. Elsevier; 2019.
- Love S, Louis DN, Ellison DW, editors. *Greenfield's Neuropathology*. 8th ed. CRC Press / Taylor & Francis; 2020.

Course Title: Neuropharmacology

Course: Core

Credits: 3 **Number of Hours: 45**

Course Learning Objectives:

a. To understand the fundamental pharmacokinetic and pharmacodynamic principles involved in the use of drugs.
b. To understand the mechanism of action, uses and adverse effects of common drugs used for different disease conditions.
c. To understand the methods of evaluation of neuro-pharmacological drugs.

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
1	6hrs	**Introduction** General pharmacological principles-Definition-Routes of drug administration-Pharmacokinetics-Pharmacodynamics-Adverse drug effects Neurotransmitters-Principles of therapeutics.	√			10%	SE
2	10hrs	**Drugs acting on Autonomic Nervous System and Peripheral Nervous System** General considerations-Cholinergic system &	√			25%	LE,SE

		drugs-Ant cholinergic drugs-Adrenergic drugs-antiadrenergic drugs-Drugs acting on autonomic ganglia. Skeletal muscle relaxants-Local anesthetics					
3	10hrs	**Drugs acting on Central Nervous system** General anaesthetics-Ethyl & Methyl alcohol-Sedatives-Hypnotics-Antiepileptics-Antiparkinsonian drugs-Drugs used in mental illness-Opioid analgesics & Antagonists-Non opioid Analgesics-Nonsteroidal Antiinflammatory drugs-Drugs for arthritides-CNS stimulants-Cerebroactive drugs	√			25%	LE,SE
4	6hrs	**Cardiovascular drugs & Drugs affecting Blood & Blood formation** Cardiac glycosides-Ant arrhythmic drugs- Anti-anginal drugs-Antiischaemic drugs-Antihypertensives.		√		10%	LE,SE

		Haematinics-Erythropoietin-Drugs affecting-coagulation-Bleeding-Thrombosis-Hypolipidemic drugs-Plasma expanders.					
5	6hrs	**Antimicrobial drugs** General consideration-Antibiotics-Antibacterial agents-Antitubercular drugs-Antifungal-Antileprotic-Antiviral-Antimalarial-Antiamoebic-Antiprotozoal drugs-Antiseptic-Disinfectant-others.		√		15%	SE
6	7hrs	**Hormones & related rugs & Miscellaneous drugs** Introduction-Inhibitors-Corticosteroids-Thyroid-Oxytocin Vitamins-Vaccines-Sera-others		√		15%	LE,SE

Reference Books:

- Tripathi KD. *Essentials of Medical Pharmacology*. 9th ed. New Delhi: Jaypee Brothers Medical Publishers; 2023.

Course Title: Bioethics

Course: Core

Credits: 3 **Number of Hours: 45**

Course Outcomes:

After completing this course, you can be able to:

a. Locate the importance of bioethics in health care and research
b. Understand the ethical principles and theories
c. Identify ethical issues in healthcare setting and their possible solutions
d. Analyze the ethical issues in specific clinical settings
e. Apply ethical principles in clinical research
f. Locate the importance of healthcare provider- patient relationship

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage (%)	Type of Questions
I	**5**	**Introduction to bioethics** 1.1 Definition and scope of bioethics	√			**10**	**LE, SE**
		1.2 History of bioethics		√			
		1.3 Codes of ethics	√				
II	**5**	**Ethical principles and theories** 2.1 The ethical principles	√			**30**	**LE, SE**
		2.2 Ethical theories and their	√				

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage (%)	Type of Questions
		2.3 Application of ethical theories and principles in healthcare	√				
III	**10**	**Ethics in healthcare** 3.1 Consent	√			**20**	**LE, SE**
		3.2 Risk: benefit analysis	√				
		3.3 Distributive justice		√			
		3.4 Privacy and confidentiality	√				
		3.5 Stigma and discrimination		√			
		3.6 Health technology assessment			√		
		3.7 Public health ethics			√		
IV	**15**	**Specific ethical issues in healthcare** 4.1 End of life care and euthanasia	√			**10**	**SE**
		4.2 Artificial reproductive techniques			√		
		4.3 Medical termination of pregnancy		√			
		4.4 Pre-natal sex determination		√			

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage (%)	Type of Questions
		4.5 Organ donation		√			
		4.6 Medical errors and truth telling	√				
		4.7 Medical negligence and malpractice	√				
V	**10**	Research ethics Research ethics principles	√			**30**	**LE, SE**
		Informed consent	√				
		Vulnerability in research	√				
		Responsible conduct of research	√				
		Publication ethics	√				

❖ **LE-** Long Essay**, SE-** Short Essay

Reference Books:

1. English DC. Bioethics a Clinical Guide for Medical Students.
2. TayaoeM.C.Textbook of Medical Bioethics, Attitude and Communication for Medical Students; 2016 Feb 28
3. Princy Louis Palatty. A Textbook of Bioethics for Healthcare Professionals 1st Edition; 2018

Course Title: Neuroscience Clinical Skills II

Practical I

Neuropathology

Course: Core

Credits: 4 **Number of Hours: 120**

Course Outcomes:

After completing this course, student should be able to able to:

a. Grow knowledge on skills in Diagnosis, Clinical decision Making in the pathological aspects of neurological diseases.

b. Grow Knowledge on skills in Diagnosis, Clinical decision Making in the immunological aspects of neurological diseases.

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to know	Weightage
1.	120Hours	Hydrocephalus	√			**7%**
2.		Anencephaly	√			7%
3.		Brain abscess	√			7%
4.		Meningioma	√			7%
5.		Intracranial hemorrhage	√			7%
6.		Malignant melanoma	√			7%
7.		Schwannoma	√			7%
8.		Left ventricular hypertrophy Rheumatic vegetation	√			7%

Unit	Hrs	Content	Must Know	Good to Know	Desirable to know	Weightage
9.		1. TB lung	√			7%
10		1. TB lymph node	√			7%
11.		Shock	√			8%
12.		1. Pulmonary embolism	√			8%
13.		Gangrene	√			7%
14.		1. Meningioma	√			7%

Practical- II: NEUROIMMUNOLOGY

Course content:

Unit I

Cellular components of the immune system (B cells, T cells, Macrophages, Neutrophils and Monocytes), MHC complex (MHC class I & II and HLA antigen), Immune response (Humoral, Cell mediated and Tolerance) and learn & perform basic serological tests

Unit II.

Autoimmunity Mechanism and CNS autoimmune diseases) and Tumor immunology (mechanism and immunologically mediated tumors**.**

Course Outcome:

- Skills in Diagnosis, Clinical decision Making, Management and co management of pathological aspects of neurological diseases.
- Knowledge in Diagnosis & Identifying, Clinical decision Making, Management and co management of the immunological aspects of Neurological diseases.

Unit	Hrs	Content	Must Know	Good to Know	Desirable to know	Weightage
1.	120Hours	Cellular components of the immune system (B cells, T cells, Macrophages, Neutrophils and Monocytes)	√			**20%**
2.		MHC complex (MHC class I & II and HLA antigen)	√			20%
3.		Immune response (Humoral, Cell mediated and Tolerance)	√			20%
4.		Autoimmunity Mechanism and CNS autoimmune diseases	√			20%
5.		Tumor immunology (mechanism and immunologically mediated tumors**.**	√			20%

Reference Books:

NEUROPATHOLOGY:

1. Mohan H, Mohan S. Essential pathology for dental students. JP Medical Ltd; 2011 Jun 30.
2. Kumar V, Abbas A, Aster JC, editors. Robbins basic pathology e-book. Elsevier Health Sciences; 2017 Mar 8.

NEUROIMMUNOLOGY:

1. Ananthanarayan R. Ananthanarayan and Paniker's textbook of microbiology. Orient Blackswan; 2006.

Practical III(Clinical Rotation)

Credits: 4 **Number of Hours: 180**

Course outcomes:

After completing this course, student should be able to able to:

Understand Diagnosis, Clinical decision Making, Management and co management of anterior segment ocular diseases.

Course Content:

In this course students will be posted in various clinical settings of the Neurology OPD and the student will get experience in various aspects in diagnosis and management of various neurological conditions under the supervision of experienced professionals and is expected to work and contribute in the unit.

SEMESTER III

Course Title: Neurology I

Course: Core

Credits: 3 **Number of Hours: 45**

Course Outcomes:

It will cover common neurological diseases and their causes, pertinent microbiology and pathology of the systems involved.

It will cover the outline of major signs and symptoms and management of the Neurological disease including medical and surgical intervention.

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
1	6hrs	CVA -Cause, Types, syndromes, treatment Ischemic diseases Thrombotic, Embolic Trauma , Head injury Spinal, Peripheral Vascular diseases	√			20%	LE,SE
2	6hrs	Infectious diseases Bacterial Mycobacterium Viral Fungal Spirochetal Rickettsial	√			15%	SE
3	10hrs	Demyelinating disease	√			25%	

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
		AIDP CIDP Central Multiple sclerosis Peripheral other Demyelinating neuropathies					LE,SE
4	8hrs	Somatic disorders Pain, Headache, Backache Craniofacial pains Cervical spondylosis Thoracic out let syndrome		√		10%	SE
5	8hrs	Disorders of speech & Language Aphasia & its types Articulation & phonation Disturbances of cerebrospinal fluid Hydrocephalus Disease of cranial nerves, V & VII nerve		√		15%	LE,SE
6	7hrs	Inherited metabolic disease Autosomal disease Mitochondrial disease Sleep & its abnormalities Physiology Sleep disorders Developmental disease of nervous system Microcephaly, Macrocephaly		√		15%	LE,SE

Reference Books:

- Singh V. *Textbook of Clinical Neuroanatomy*. 5th ed. Elsevier Health Sciences; 2024.
- Snell RS. *Clinical Neuroanatomy*. 8th ed. Lippincott Williams & Wilkins; 2021.

Course Title: Neurosurgery

Course: Core

Credits: 3 **Number of Hours: 45**

Course Outcomes:

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

Understand common neurosurgical aspects of diseases and their causes, pertinent microbiology and pathology of the systems involved.

Explain the outline of major signs and symptoms and management of the Neurological disease including medical and surgical intervention.

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
1	15hrs	**Principles of Neurosurgery** Neurosurgical emergencies in Neurology Patients Acute hydrocephalus Cerebellar hemorrhage & Infarction Intracerebral hemorrhage Intracranial tumors Brain abscess Pituitary tumors Pitutory apoplexy Spinal cord compression Cauda equina compression	√			34%	LE,SE

2	15hrs	**Neurosurgical consideration in common neurological disorders** Subarachnoid hemorrhage Vascular malformation Brain tumors Meningiomas Tumors of the base of the skull Metastatic tumors Ischemic cerebrovascular disease Pseudo tumor cerebri Pain Cord compression Trigeminal neuralgia Hemi facial spasm Spinal arteriovenous malformations Spasticity Cervical spondylosis Brain biopsy Epilepsy Movement disorders & Parkinson's disease Lumbar puncture VP shunt	√			34%	LE,SE
3	15hrs	**Newer Neurosurgical Developments** Microsurgery Skull base techniques	√			32%	LE,SE

		Intraoperative Angiography Neurophysiologic monitoring Real time image guided surgery Frameless stereo taxis Radio surgery Endovascular surgery					

Reference Books:

- **Lindsay KW, Bone I, Fuller G.** *Neurology and Neurosurgery Illustrated*. 6th ed. Edinburgh: Elsevier Churchill Livingstone; 2010.
- **Lindsay KW, Bone I, Fuller G.** *Neurology and Neurosurgery Illustrated*. 7th ed. Edinburgh: Elsevier; 2018.

Course Title: Neuropsychology

Course: Core

Credits: 3 **Number of Hours: 45**

Course Outcomes:

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

a. Know about the brain & behaviour

b. Understand the Neuropsychology

c. List out the different fields of Neuropsychology

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
1	4hrs	**Introduction to Neuropsychology** **Neuropsychology:** Lesion studies of 19th Century-Broca and localization of Speech, Wernicke &begning of modern neuropsychology, Cytoarchitecture &myeloarchietecture, Neuropsychological syndromes, Functional system, Double dissociation of functions, The disconnection syndrome.	√			10%	LE,SE

		Basic Anatomy of Brain: Coverings, Brain structure, relationships, CNS, Blood supply, Structures **Elements of Neurology:** Methods of Investigation, Common Neuropsychological disorder & disease of the brain **Hemispheric asymmetry:** Concept of cerebral dominance, hand preference, unilateral lesion, visual studies-asymmetry, Tactile perception, auditory perception, temporal order, right hemispheric & communication, memory & learning, Emotional functions, Bilateral effects from unilateral lesion, Attention & right hemisphere, Familiarity	√				
2	8hrs	**The Frontal Lobe** Frontal lobe syndrome, Confabulation, Utilization behavior, lesion studies, Personality, Cognitive changes, Frontal lobe syndrome	√			20%	LE,SE

3	10hrs	**The Temporal Lobe** Integrative Functions, Organizations, Auditory system, Visual perception, Olfactory function, Temporal lobe seizures, Behavioural changes, Hallucinations and illusions, general amnesic syndrome	√			20%	LE,SE
4	10hrs	**The Parietal Lobe** Sensory & perceptual disturbances , Somatosensory discrimination, Tactile discrimination, Spitial orientation disorders, Location , orientation, Constructural apraxia Concept, confusions, frontal apraxia, Spatial disorder, unilateral spatial neglect, spatial alexia, acalcuila, anosognosia lack of awareness of body parts, Right, left disorientation, gerstmann syndrome, short term memory.	√			20%	LE,SE
5	8hrs	**The occipital lobes**	√			20%	LE,SE

		Cerebral blindness, blindsight, Denial of blindness, adaptation to visual fields, hysterical blindness, Visual perception, Agnosia, Visual object agnosia, Simultanagnosia, Prosopagnosia, Alexia without agraphia, reversibla alexia, Visual hallucinations.					
6	5hrs	**Brain &Behaviour** Orientation, Related disciplines, Cognitive neuropsychology, Behavioural neuropsychology, Neuropsychiatry, Evaluation, Therapeutic intervention, Forensic neuropsychology.		√		10%	SE

Reference Books:

- Kolb B, Whishaw IQ. *Fundamentals of Human Neuropsychology*. 7th ed. New York: Worth Publishers; 2015.

Course Title: Health Care Management

Course: Core

Credits: 3 Number of Hours: 45

Course Outcomes:

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

a. Understand Concepts of Hospitals: The student will gain knowledge about hospital administration & planning.

b. Analyse Workflow in hospitals: Enumerate and identify various Clinical Services like OPD, IPD, ward Management, OT, Emergency, disaster Management and ICU.

c. Understand Organizational Structures: To learn to meet special challenges posed by human behavior in workplace of 21stcentury

d. Explain Quality management - To create awareness about the process of applying for and implementing various accreditation processes in health care facilities.

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type of Questions
I	2	**Hospital Structure** Introduction to Hospitals, Healthcare & Medical Care, Rationale of HospitalAdministration	√			5%	SE
		History of Hospitals, Public Health Delivery system in India, Types of Hospitals,VoluntaryHealth Organizations			√		
II	5	**Management of Healthcare Organizations** Introduction to Management	√			20%	LE, SE
		Evolution & Theories of Management		√			

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type of Questions
		Management Functions: Planning	√				
		Organizing	√				
		Controlling	√				
		Decision Making	√				
		Staffing	√				
		Techniques in Management	√				
III	**5**	**Organizational Behaviour** The Importance of Interpersonal Skills, Scope & Process of OB Structure & theories	√			15%	LE, SE
		Motivation - Abraham Maslow's hierarchy of needs theory, Theory X & Y. Contemporary theories of motivation.					
		Foundations of Group Behavior – Formal Vs Informal, Social Identity Theory		√			
		Organizational Culture		√			
		Communications in an Organization	√				
IV	**5**	**Management and Health Economics** Demand & Supply	√			20%	LE, SE
		Nature of Costs	√				
		Marginal cost and breakeven analysis	√				

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type of Questions
		Market structure: Business & Government, Role of Government	√				
V	**5**	**Accounting for Hospital Management** Budgeting & Budgetary control - Classification of budget, P & L, Balance Sheets	√			20%	LE, SE
		Types of Accounts, Debit & Credit	√				
		Financial Statement Analysis	√				
VI	**5**	**Concept of Hospital** Departmentation in Hospital	√			10%	SE
		Outpatient, Inpatient Services	√				
		Intensive Care Unit, Emergency Services	√				
		Laboratory, Radiology	√				
		Organizing of support services, Utility Services	√				
		Evaluation of Hospital services – Hospital Statistics	√				
		Hospital Information Systems - Issues related to Healthcare technology, Planning, Infrastructure	√				
VII	**3**	**Evolution of Quality management** Quality Management Tools & methods	√			10%	SE

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type of Questions
		Quality certification & Accreditation – NABH, NABL	√				

❖ **LE-** Long Essay**, SE-** Short Essay

Reference Books:

a. Prasad LM. Principles and practice of management. Sultan Chand & Sons; 2020 Oct 1.

b. Sadri J. Organizational Behavior: Human Behavior at Work.

c. Gohil DP, Gohil K. Public Relations in Hospital Administration and Planning. International Journal of Health Science and Research. 2016(6):2.

Course Title: Neuroscience Clinical Skills III

Practical I (Neurology& Neurosurgery)

Course: Core

Credits: 4 **Number of Hours: 120**

Course Outcomes:

After the Course the students will be able to:

a. To attain skills in Diagnosis, Clinical decision Making, Management and co management of Neurological diseases.

Course Content:

1. Spotters based on Theory
2. Viva based on Theory

Practical II

Credits: 4 **Number of Hours: 180**

Course Outcomes:

After the Course the students will be able to:

Understand Diagnosis, Clinical decision Making, Management of Neurological diseases.

Course Content:

In this course students will be posted in various clinical settings of theNeurology OPDand the student will get experience in various aspects in diagnosis and management of various ocular conditions under the supervision of experienced professionals and is expected to work and contribute in the unit.

SEMESTER IV

Course Title: Neurology II

Course: Core

Credits: 3 **Number of Hours: 45**

Course Outcomes:

After the Course the students will be able to:

Understand common neurological diseases and their causes, pertinent microbiology and pathology of the systems involved.

Evaluate the outline of major signs and symptoms and management of the Neurological disease including medical and surgical intervention.

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
1	6hrs	Epilepsies Classification & clinical approach Epileptic syndrome Treatment	√			15%	LE,SE
2	10hrs	Disorders of PNS & Neuromuscular transmission Neuropathies/entrapment and infective neuropathies-Leprosy, Rabies Myasthenia gravis Myasthenic syndrome Botulism	√			20%	LE,SE
3	10hrs	Disorder of Muscle Twitches & pain & cramps	√			20%	LE,SE

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
		Inflammatory myopathies Muscular dystrophies – Classification Metabolic & toxic myopathies Congenital muscular disorders Myotonia					
4	7hrs	Degenerative disorders & Classification Alzheimers Dementia Chorea Extrapyramidal disorders Parkinsonism	√			20%	LE,SE
5	4hrs	Disorders of Autonomic Nervous system Physiology Regulation of BP		√		10%	SE
6	8hrs	Disorders of equilibrium Vertigo Metabolic & Deficiency disorders Toxic and metabolic disorders Deficiency disorders	√			15%	LE,SE

Reference Books:

- Singh V. *Textbook of Clinical Neuroanatomy*. 5th ed. Elsevier Health Sciences; 2024.
- Snell RS. *Clinical Neuroanatomy*. 8th ed. Lippincott Williams & Wilkins; 2021.

Course Title: Neurorehabilitation

Course: Core

Credits: 3 **Number of Hours: 45**

Course Outcomes:

After the Course the students will be able to:

a. Analyze, interpret and evaluate various neurological conditions.
b. Evaluate the effects of various neurological therapeutic techniques and prognosis.

Course Content:

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
1	7hrs	**NEURO REHABILITATION** Goal and structure of Rehabilitation Aims Personnel Process of rehabilitation Evaluation of Neuro rehabilitation General Organisation Organisation of services for chronic & progressive neurological disorders	√			17%	LE,SE
2	8hrs	**NEURO SCIENTIFIC BASIS OF REHABILITATIVE INTERVENTIONS** Recovery of neuronal excitability, activity in partial spared pathways, alternative behavioural strategies Distributed networks – cortical & subcortical representation adaptation, biological interventions.	√			17%	LE,SE

Unit	Hrs	Content	Must Know	Good to Know	Desirable to Know	Weightage	Type Of Questions
3	8hrs	**PHARMACOLOGICAL INTERVENTIONS** Pharmacological agents facilitate – drugs- Dopamine blocker – nor alregenic drugs – others.	√			17%	LE,SE
4	7Hrs	**COMMON NEUROMEDICAL PROBLEMS DURING REHABILITATION** Frequency of complications Management of neurological problems – prevention	√			16%	LE,SE
5	7hrs	**THERAPIES FOR IMPAIRMENT AND DISABILITIES** Therapies for physical impairment and disabilities Exercise and compensatory functional training – conditioning and strengthening adaptive equipments. Therapies for cognitive and behavioral impairments and disabilities. Feeding – bathing – mobility – toileting – dressing – computer work station – memory – aphasia	√			16%	LE,SE
6	8hrs	**FUNCTION AND OUTCOMES WITH REHABILITATION** Ambulation, self-care skills – stroke, Parkinson's disease, Multiple Sclerosis, Spinal cord injury, Traumatic brain injury.	√			17%	LE,SE

Reference Books:

- O'Sullivan SB, Schmitz TJ, Fulk GD. *Physical Rehabilitation*. 7th ed. Philadelphia: F.A. Davis Company; 2019.
- Barnes MP, Good DC, editors. *Handbook of Clinical Neurology: Neurological Rehabilitation*. 3rd series, Vol. 110. Amsterdam: Elsevier; 2013.

Course Title: Neuroscience Clinical Skills IV

Practical I (Neurology)

Course: Core

Credits: 4 **Number of Hours: 120**

Course Outcomes:

After the Course the students will be able to:

a. To attain skills in Diagnosis, Clinical decision Making, Management and co management of Neurological diseases.

b. To Diagnosis and understand the pathophysiology & Clinical correlations of Neurological diseases.

Course Content: 120 Hours

1. Spotters based on Theory
2. Viva based on Theory

Practical II

Credits: 4 **Number of Hours: 180**

Course Learning Objectives:

After the Course the students will be able to:

a. To understand Diagnosis, Clinical decision Making, Management and co management of Neurological diseases.

Course Content:

In this course students will be posted in various clinical settings of theNeurology OPDand the student will get experience in various aspects in diagnosis and management of various ocular conditions under the supervision of experienced professionals and is expected to work and contribute in the unit.

Dissertation

Course: Core

Credits: 12

Each candidate is required to carry out dissertation on a selected topic under the guidance of a recognized post graduate teacher after the submission of the synopsis.

The topic for the Dissertation should be chosen based on an area of interest. The aim of the dissertation is to enable the student to gain an in-depth insight into a particular department or topic chosen for study.

The synopsis shall be presented to the Board of Studies for acceptance. If found suitable shall register the dissertation topic. No change in the dissertation topic or guide shall be made without prior approval of the University.

Every candidate shall submit the synopsis containing particulars of proposed dissertation within nine months from the date of commencement of the course.

The dissertation shall be written under the following headings:

- Introduction
- Objectives of study
- Review of literature
- Materials and Methods
- Results
- Discussion
- Conclusion
- Recommendation
- Summary
- Bibliography
- Annexure

The written text of Dissertation should be neatly typed in double line spacing on one side of paper (A4 size) and should be bound, Spiral binding should be avoided. A declaration by the candidate that the work was done by him/her shall be included. The co-guide (where ever applicable), guide, head of the department and head of the institution shall certify the bonafide of the dissertation.

Two copies of the dissertation shall be submitted to the university through proper channel along with a soft copy (CD), three months before the final examinations. It shall be assessed by two examiners appointed by the university, one internal and one external.100 marks shall be awarded for the Dissertation.

Acceptance of the dissertation is a pre-requisite for a candidate to be eligible to appear in the final examination.

Guide:

The teaching experience required for recognition of guide shall be as given under:

MS /MD / FNB withexperience of 2years after the Masters programme.

Student guide ratio: A recognized guide shall supervise dissertation work of not more than five students per academic year. The age of guide shall not exceed 68 years.

Co-Guide may be included provided the work requires substantial contribution from a sister department or from another institution recognized for teaching Yenepoya University or any other State level University.

Change of Guide: In the event of registered guide leaving the Institute/ college due to any reason or in the event of death of the guide or any other valid reasons, guide may be changed with prior permission from the university only

Dissertation shall be evaluated by 2 examiners, one external & one Internal from the panel of examiners approved by the board of studies and by the University.

The criteria for the evaluation shall be as prescribed by the board of studies.

Acceptance of the dissertation is a pre-requisite for a candidate to be eligible to appear in the final examination.

ANNEXURES

List of Annexure:

Annexure I: Question Paper Layout for Theory Examination

Annexure II: Logbook Format

Annexure III: Journal Club Presentation Evaluation

Annexure IV: Assignment Guidelines

Annexure V: Seminar Assessment

Annexure VI: OSPE Checklist

Annexure I

MODEL QUESTION PAPER

I Semester M.Sc. Neuroscience

Time: 2 ½ Hours Max. Marks: 50 Marks

COURSE NAME:
QP Code:

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary.

LONG ESSAY **(2x15=30Marks)**

1.

2.

SHORT ESSAY **(2x10=20Marks)**

3.

4.

******

YENEPOYA
(DEEMED TO BE UNIVERSITY)

MODEL QUESTION PAPER (for Jointly Offered Course)

I Semester M.Sc. Neuroscience

Time: 2 ½ Hours Max. Marks: 50 Marks

COURSE NAME:
QP Code:

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary.

Part A

LONG ESSAY **(1x15=15Marks)**

1.

SHORT ESSAY **(1x10=10Marks)**

2.

******

Part B

LONG ESSAY **(1x15=15Marks)**

1.

SHORT ESSAY **(1x10=10Marks)**

2.

******

ANNEXURE II

YENEPOYA
(DEEMED TO BE UNIVERSITY)

Yenepoya School of Allied Health Sciences

Constituent college of
Yenepoya (Deemed to be University)
University Road, Deralakatte
Mangaluru – 575018

Master of Science in Renal Dialysis Technology (M.Sc. RDT)

LOG BOOK

Academic Details

Name of the Student: _____

Campus ID: _____

Register ID: _____

E mail ID: _____

Ph. Number: _____

CERTIFICATE

This is to certify that the candidate Mr/ Ms……,

Reg No. ……., admitted in the year 2024 - 25 in the Yenepoya School of Allied Health Sciences, a constituent college of Yenepoya (Deemed to be University) has satisfactorily completed the requirements mentioned in this logbook for M.Sc. Neuroscience during the period from …… to…….

Signature of Clinical Coordinator

Name and Designation

Countersigned by Program Coordinator

Principal/Dean of the College

Place:

Date:

GENERAL INSTRUCTIONS

1) The logbook is a record of the academic / co-curricular activities of the designated student, who would be responsible for maintaining his/her logbook.

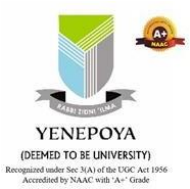
2) The student is responsible for getting the entries in the logbook verified by the clinical coordinator regularly.

3) Entries in the logbook will reflect the activities undertaken in the department & have to be scrutinized by the program coordinator.

4) The logbook is a record of various activities by the student like:

- Overall participation & performance
- Attendance
- Participation in sessions
- Record of completion of pre-determined activities.
- Acquisition of selected competencies

5) The logbook is the record of work done by the candidate in that department / specialty and should be verified by the clinical coordinator.



SI. No.	Reportedon	Departments	Completedon	Remarks	Signatureof theClinical Supervisor

YENEPOYA
(DEEMED TO BE UNIVERSITY)

NAMEOFTHE PATIENT			
S.NO		MONITORED/HANDSON	
OP/IPNO.		DATE	
AGE/SEX		TECHNOLOGIST	
ID.NO			
Patient History			
ClinicalDiagnosis			
Medications			
Electroencephalographicfindings:			
Impression:			

SIGNATURE OF CO-ORDINATOR

YENEPOYA
(DEEMED TO BE UNIVERSITY)
Recognized under Sec 3(A) of the UGC Act 1956
Accredited by NAAC with 'A+' Grade

NAMEOFTHE PATIENT			
S.NO		MONITORED/HANDSON	
OP/IPNO.		DATE	
AGE/SEX		TECHNOLOGIST	
Patient History			
ClinicalDiagnosis			
Medications			
Neurophysiologicalfindings:			
Impression:			

SIGNATURE OF CO-ORDINATOR

YENEPOYA
(DEEMED TO BE UNIVERSITY)

ANNEXURE III

Journal Club presentation evaluation sheet

Name of the student: **Registration No.:**

Programme: **Name of the Evaluator:**

AssessmentCriteria			Marks Awarded
1	**Source & Relation of the SelectedArticle&Timely Circulation Marks:(0-10)**	Whether the article is peer-reviewed/indexed	**Marks:(0-10)** **____x 1**
2	**Introduction, Literature Review &Objectives**	Hypothesis and/or objectives are very clearly presented with rationale.	**Marks:(0-10)** **____x 1**
3	**Methodology**	Allpossibleaspectsof description of the research methods (research design, sampling, tools & procedure) of the paper presented with clear rationale & wide range of evidence clearly exhibiting excellent knowledgeonresearchmethods.	**Marks:(0-10)** **____x 1**
4	**Resultsand Discussion**	Results with tables and graphs are very clear and logically presented to answer the objectives of the presented paper. Excellent discussion of the research project with the integration of evidence presented analytically with very appropriate limitations of the study.	**Marks:(0-10)** **____x 1**
5	**Conclusion**	Conclusionprovidedisspecific and justifiedbasedonthefindingsof the study.	**Marks:(0-10)** **____x 1**

6	**Critical appraisal of the Selected research study**	All the possible aspects of the paper were appraised with appropriate critical appraisal tool and the critiques presented analytically relating the strengths and weaknesses of the study. **Marks: (0-10)**	**Marks:(0-10)** **____x 1**
7	**Presentation**	Flawless in the organization, alignment and structured arrangement of slides. Fluent and consistent while presenting the slides(Coherentandanalytical explanation withreference to different areas of the article).	**Marks:(0-10)** **____x 2**
8	**Journal Club Discussion**	Excellent and detailed attempt to rationalize for the answers given demonstrating analytical understanding at depth on the presented paper. Interaction with audience was enhanced throughout,focused,appraised& conclusive.	**Marks:(0-10)** **____x 2**
	Comments if any:		**Total marks – (Max.Marks–100)**

Date of Presentation: _____

Signature of the Evaluator: _____

YENEPOYA
(DEEMED TO BE UNIVERSITY)

ANNEXURE IV

M.Sc.Programme

ASSIGNMENT GUIDELINES

- Each student has to submit one assignment in each of the core courses.
- The assignment topics need to be displayed on the **Yengage portal** by the 4th week of instruction of the semester (Dates specified in the Semester Planner)
- The assignment topic should be in correspondence with the topics covered in the 2 units of the syllabus.
- The students have to submit the assignments on the Yengage portal within 10days of intimation. (Dates specified in the Semester Planner). After which, the assignments cannot be uploaded.
- The faculty needs to evaluate the assignment based on the evaluation rubric
- The assignment marks have to be displayed on the Yengage portal within 15days of submission(Dates specified in the Semester Planner)

Points to consider for the presentation of Assignment (for PGs)

- The word limit for the Assignment is 3,000 words or less.
- Should be presented in Times New Roman font, Size 12, with either double or 1.5 line-spacing, and page numbers beginning with 2 on the second page of the introduction.
- Assignment should include a title page and reference list (neither of which will be included in the assignment word count).
- Basic structure to be followed are as follows:
    - **Introduction** (10% of the assignment): This is where you introduce the topic and briefly explain the purpose of the assignment.
    - **Discussion** (80% of the assignment): This section is divided into a number of paragraphs. A paragraph usually starts with a topic sentence stating the main idea, followed by supporting evidence and examples.
    - **Conclusion** (10% of the assignment): this section briefly restates your main argument, evaluate your ideas and summarise your conclusions. Don't introduce any new information in this section.

Report Evaluation

Name of the student: _____

Program: _____

Course: _____

Assignment Topic: _____

Date of submission: _____

Faculty In charge: _____

Sl. No.	Assessment criteria	Marks Allotted	Marks Awarded
1	Title/Cover page	02	
2	Table of contents	02	
3	Organization of assignment	10	
4	Level of Content	03	
5	Pictures/diagrams	03	
6	Bibliography	02	
7	Grammar/Neatness	03	
	Total points	25	

ANNEXURE V

M.Sc. Programmes

Seminar Assessment

- A student shall deliver minimum one seminar from each core course per semester.
- The seminar topic shall be allotted by the faculty based on the course content.
- The faculty needs to evaluate the seminar based on the evaluation rubric given.

Rubric for Seminar Evaluation				
Assessment Criteria	Exceeds Expectations	Meets Expectations	Below Expectations	Not Acceptable
Score	5	4	2	1
Organization & Style	Information is presented in a logical, interesting way, which is easy to follow. Purpose is clearly stated and explains the structure of work.	Information is presented in a logical manner, which is easily followed. Purpose of work is clearly stated assists the structure of work.	Work is hard to follow as there is very little continuity. Purpose of work is stated, but does not assist in following work.	Sequence of information is difficult to follow. No apparent structure or continuity. Purpose of work is not clearly stated.
Content & Knowledge	Demonstration of full knowledge of the subject with explanations and elaboration.	At ease with content and able to elaborate and explain to some degree.	Uncomfortable with content. Only basic concepts are demonstrated and interpreted.	No grasp of information. Clearly no knowledge of subject matter. No questions are answered. No interpretation made.
Format& Aesthetics	Format is consistent throughout including heading styles and captions. Figures and tables are presented	Format is generally Consistent including heading styles and captions. Figures and tables are neatly done and provide	Mostly consistent format. Figures and tables are legible, but not convincing.	Work is illegible, format changes throughout, e.g. font type, size etc. Figures and tables are sloppy and fail

	logically and reinforce the text.	intended information.		to provide intended information.
Spelling & Grammar	Negligible (1 or 2 per page) misspellings and/or grammatical errors.	Minor (5 to 10 per page)misspellings and/or grammatical errors.	Several spelling (11 to25 per page) and grammatical errors.	Numerous spelling (> 25per page) and grammatical errors.
References	Reference section complete and comprehensive. Consistent and logical referencing system.	Minor inadequacies in references. Consistent referencing system	Inadequate list of references or references in text. Inconsistent or Illogical referencing system.	No referencing system used.
Viva Voce	Masterfully defends research by providing clear and insightful answers to questions	Competently defends by providing very helpful answers	Answers questions, but often with little insight	Does not answer

YENEPOYA
(DEEMED TO BE UNIVERSITY)

M.Sc. Programmes

Seminar Assessment Scoring Sheet

Name of the Student:

Registration No. :

Class:

Rubric for Seminar Evaluation				
Assessment Criteria	**Exceeds Expectations**	**Meets Expectations**	**Below Expectations**	**Not Acceptable**
Score	**5**	**4**	**2**	**1**
Organization & Style				
Content & Knowledge				
Format&Aesthetics				
Spelling&Grammar				
References				
VivaVoce				
Total Score (Max Score – 30)				

Assessment done by: **Accessor Signature**

ANEXXURE VI

M.Sc. Neuroscience Technology

Objective Structured Practical Examination (OSPE)

Test: Electroencephalography **Max. Marks:** 30
Time: 30 Minutes

Objective:

- To place the EEG electrode placement according to 10-20 System.
- Assess any artifacts and record an EEG graph with minimal artifacts
- Knowledge of activation procedure

Skills Tested:

To assess patient data ;

- Prepare and adjust monitor settings for the procedure.
- Correct electrode placement.
- Recognizing artifacts and has the knowledge to correct them
- Identifying landmarks for electrode placement.
- Recall normal frequency band for the Waveforms.
- Recognize disorders related to the abnormality shown.

Checklist for the Observer: **Reg. Number:**

Assessing Patient Data (30 Marks)	**Marks**	**Remarks**
• Monitor settings for procedure initiation 6m • Correct electrode placement 6m • Identification of landmarks and measurement 6m • Knowledge of normal frequency band of EEG 6m • Identification of abnormal waveforms 6m		
Total Marks		

Signature of the Observer

YENEPOYA
(DEEMED TO BE UNIVERSITY)

M.Sc. Neuroscience Technology

Objective Structured Practical Examination (OSPE)

Test: Nerve Conduction Study – Upper & Lower Limbs
Max. Marks: 30

Time: 20 Minutes

Objective:

- To assess the anatomy of the nerve and placing of recording electrodes
- To assess nerve function and identify possible nerve disorders.

Skills Tested:

To assess patient data ; □ Prepare and adjust monitor settings for the procedure. □ Correct electrode placement. □ Identify stimulation points on the nerves. □ Recall normal conduction values for all four limbs. □ Recognize disorders related to the tested nerves.

Checklist for the Observer:

Reg. Number:

Assessing Patient Data (30 Marks)	**Marks**	**Remarks**
• Monitor settings for procedure initiation 6m • Correct electrode placement 6m • Identification of stimulation points 6m • Knowledge of normal values (all four limbs) 6m • Identification of nerve-related disorders 6m		
Total Marks		

Signature of the Observer