

**STATE COUNCIL OF MEDICAL
SCIENCES ODISHA**



**CERTIFIED NEURO TECHNICIAN
(CNT)**

Syllabus for Certified Neurotechnician(One yr)

First semester commences from Day 1 to completion of 5th month followed by examination in the 6th month & second semester commences from Day 1 of 7th month to completion of 11th month followed by examination in the 12th month

DISTRIBUION OF MARK:

	THEORY	PRACTICAL	CLINICAL	Int. Assesment	Total
1 st Semester	50	40	XXX	10	100
2 nd Semeter	30	XXX	60	10	100

Theory : 60 teaching Hours:

First semester (Day 1 to completion of 5th month) followed by examination in the 6th month

Sl. No	Subjects for Theory Classes	Hours
A) Anatomy	<ul style="list-style-type: none"> ➤ Nervous System & its subdivision : ➤ Central ➤ Peripheral ➤ Autonomic 	4Hours
B) Anatomy	<ul style="list-style-type: none"> ➤ Lobes & functions of brain ➤ Gyri, Sulci, Cortical areas in brain ➤ Association commissural areas ➤ Brain Stem and Cerebellum in brain 	
C) Anatomy	<ul style="list-style-type: none"> ➤ Sensory and motor pathways ➤ Pyramidal system ➤ Upper and lower motor neuron ➤ Spinal cord 	8 hours
D) Anatomy	<ul style="list-style-type: none"> ➤ Peripheral nervous system ➤ Cranial nerves – origin, distribution, pathways ➤ Spinal cord and spinal nerves ➤ Formation of plexus ➤ Muscles – origin, insertion nerve supply and action. ➤ Concept of myotomes and dermatomes 	5 hours
D) Physiology	<ul style="list-style-type: none"> ➤ EEG Generators ➤ Resting membrane potential and action potential generation. 	5 hours

	<ul style="list-style-type: none"> ➤ Physiology of Nerve Conduction and Muscle Contraction. 	
E) Physiology	<ul style="list-style-type: none"> ➤ Commissural pathways and association areas ➤ Physiology of Neuromuscular Junction transmission. 	12 hours
F) Physiology	<ul style="list-style-type: none"> ➤ Motor and sensory tracts. ➤ Sensory receptors. 	
G) Clinical Neurology	<ul style="list-style-type: none"> ➤ Concepts of Disease and outlines of Clinical Evaluation related to Neural Science ➤ Epilepsies 	8 hours
H) Clinical Neurology	<ul style="list-style-type: none"> ➤ CNS Infections ➤ Meningitis ,Encephalitis 	8 hours
I) Clinical Neurology	<ul style="list-style-type: none"> ➤ Peripheral Neuropathy ➤ Muscle Disorders 	5 hours
J) Clinical Neurology	<ul style="list-style-type: none"> ➤ Neuromuscular Junction Disorders ➤ Demyelinating disorders 	5 hours
Total		60hrs

PRACTICALS :

(A)COMPUTER COURSE: 50Hrs

Sl.No	Topics to be covered	Hours
1	INTRODUCTION TO COMPUTERS <ul style="list-style-type: none"> ➤ Application of computers ➤ Concepts of Data and information ➤ A typical computer system ➤ Memory concepts ➤ Types of computers. 	10
2	INPUT-OUTPUT DEVICES <ul style="list-style-type: none"> ➤ Data source devices ➤ Software & the role of software 	5
3	THE COMPUTER INTERNALS <ul style="list-style-type: none"> ➤ Typical PC configuration ➤ Booting ➤ Virus, Anti-virus, ➤ Data compression Techniques ➤ Software – Versions of software. 	10
4	Number system <ul style="list-style-type: none"> ➤ Binary Arithmetic ➤ Standard codes for unit of Information. 	4
5	Operating system	6

	<ul style="list-style-type: none"> ➤ Definition ➤ Classification ➤ Introduction to windows ➤ Features of Windows ➤ Desktop and Desktop icons ➤ Starting programs, Browsing and managing windows explorer / setting / Taskbars and creating shortcuts. 	
6	Introduction to MS-DOS and WINDOWS	5
7	MS Office – MS – Word, Powerpoint, Access & Excel.	5
8	Introduction to Internet, Intranet and E-Mail	5

(B)ELECTROENCEPHALOGRAPH: 35hrs

Sl.No	Topics to be covered	Hours
1	Recording Technique A)Electrodes: a)Types, materials and characteristics b) Modes of application. c) Impedance d) Effects on E.E.G. B)The 10-20 System. C)Reference and Bipolar Technique D) Reference contamination E)Fields F) Montage and localization. a)Cancellation and summation b)Phase reversal.	10
2	PATIENT GROUNDING AND ELECTRICAL SAFETY	5
3	TROUBLE SHOOTING.	10
4	OTHER RECORDING DEVICES: ➤ Cathode Ray Oscilloscope ➤ Averager .	4
5	BASIC MEASUREMENT	6

First semester Exam in 6 th month

**Second Semester (Day 1 of 7th month to completion of 11th month)
followed by examination in the 12th month**

Theory :150Hrs

Cinicals/Practicals:350hrs

COURSES OF STUDIES FOR 2ND SEMESTER

CLINICAL E.E.G.(Theory & Clinical)

Sl.No	Topics to be covered	Hours
1.	Basic E.E.G. Patterns.	
	I) Awake a) Normal b) Abnormal	
	II) Sleep a) Normal b) Abnormal	
	III) Sphenoid EEG recording a) Assisting in inserting leads b) Techniques of recording	
	IV) Epilepsy surgery – a) Prolonged telemetry EEG b) Recording ictal period & reporting pre/ictal c) Recording ictal period and reporting postictal Phases d) Intraoperative recording – (Corticogram)	
	V) Artifacts: a) Types b) Monitoring.	
2.	Seizures: a) Classification b) E.E.G. Finding c) Clinical Finding	
3.	MANAGEMENT OF PATIENT AND MACHINE. a) Cerebral vascular diseases b) Space occupied lesion c) Toxic, metabolic and endocrine conditions d) Infections, disease e) Psychiatric disorder. f) Pediatric condition. g) Drug effects on E.E.G. h) Disorders of sleep	

PRACTICALS:

- I. ELECTROMYOGRAPHY
- II. NERVE CONDUCTION STUDIES
- III. EVOKED POTENTIALS
- IV. QUANTATIVE SENSORY TESTING
- V. INTRA-OPERATIVE BRAIN AND SPINAL CORD MONITORING.

Sl.No	Topics to be covered	Hours
I)	<u>ELECTROMYOGRAPHY</u> a) Insertion activity b) Spontaneous activity (Fibs, Fascics, Myotonia, Positive Sharps, pseudomyotonia) c) Interference pattern d) Motor units e) Different types of <ol style="list-style-type: none">1. Neurogenic and myopathic patterns.2. Root stimulation study3. Single fibers EMG	
II)	<u>NERVE CONDUCTION STUDIES</u> <ol style="list-style-type: none">1. Nerve conduction velocity studies – motor and sensory and cranial nerves.2. H-Reflex and F-Wave3. Repetitive stimulation with high and low frequency4. Mac. Mani's Test for periodic paralysis5. Proximal conduction6. MUNE – Motor unit estimation study7. SSR – Sympathetic skin response.	
III)	<u>EVOKED POTENTIALS</u> <ol style="list-style-type: none">1. Evoked potential – definition.2. Different types of studies.<ol style="list-style-type: none">a) B.A.E.R.b) V.E.P.<ol style="list-style-type: none">I. Pattern Reversal.II. L.E.D. Goggles.c) S.S.E.P. - Median.d) S.S.E.P. - Tibiale) Blink Reflex.3. Intraoperative monitoring.<ol style="list-style-type: none">a) Spinal cord surgeries – monitoring SSEP – Median/Tibialb) Motor evoked potential – in Brain stem surgeries/thalamic surgeries	
IV)	<u>QST – QUANTATIVE SENSORY TESTING</u> <ol style="list-style-type: none">a) Thermal	

	b) Vibratory	
V)	INTRA-OPERATIVE BRAIN AND SPINAL CORD MONITORING. Intraoperative monitoring of Facial nerve Intraoperative monitoring of spinal cord Intraoperative monitoring of the brainstem Intraoperative monitoring for tethered cord syndrome.	

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