

DHANALAKSHMI SRINIVASAN UNIVERSITY

SAMAYAPURAM, TRICHIRAPALLI

SCHOOL OF ALLIED HEALTH SCIENCE



**B.SC-NEURO ELECTRO PHYSIOLOGY(NEP)-4 YEARS COURSE
(2024&2025)**

curriculum & syllabus 2024

Dhanalakshmi Srinivasan University,
Samayapuram, Trichy
School of allied health and science

B.Sc., Neuro Electro Physiology (NEP) – 4 Years Course Batch:2024- 2025)

CURRICULUM AND SYLLABUS

COURSE OF INSTRUCTION

SNO	SUBJECT	THEORY(Hrs.)	LAB(Hrs.)	CLINICAL(Hrs.)	OTHERS
I YEAR					
1	PAPER 1 -ANATOMY	60	50	-	-
2	PAPER 2 -PHYSIOLOGY	60	50	-	-
3	PAPER 3 -GENERAL BIOCHEMISTRY	60	50	-	-
4	PAPER 4 -PHYSICS AND PRINCIPLE OF INSTRUMENTATION	50	50	-	-
5	PAPER 5-ENGLISH	50	-	-	-
6	PAPER 6 – INSTRODUCTION TO COMPUTER	50	-	-	-
7	CLINICAL POSTING	-	-	650	-
	TOTAL	330	200	650	-
II YEAR					
1	PAPER1-ELECTROENCEPHALOGRAPHY	60	70	-	-
2	PAPER 2 – ELECTRONICS	60	70	-	-
3	PAPER-3 - EVOKED POTENTIAL	60	70	-	-
4	PAPER 4 – CLINICAL NEUROLOGY	60	100	-	-
5	PAPER 5 – BIO-STATISTICS	60	50		-
6	CLINICAL POSTING	-	-	650	-
	TOTAL	300	360		-
III YEAR					
1	PAPER 1 -NERVE CONDUCTION STUDIES AND ELECTROMYOGRAPHY	60	70		-
2	PAPER 2 – POLYSOMNOGRAPHY, TRANSCRANIAL MAGNETIC STIMULATION, AUTONOMIC LAB, INTRAOPERATIVE MONITORING.	60	70		-
3	PAPER 3 APPLICATION OF CLINICAL NEURO PHYSIOLOGY AND ASSESSMENT	60	70		-
4	CLINICAL POSTING	-	-	650	-
	TOTAL	280	210	650	-
	IV YEAR	INTERNSHIP			

PROGRAMME EDUCATIONAL OBJECTIVE (PEO)

- To Serve as a best role in the clinical laboratory profession such as technical, educational, research and administrative.
- To Understand neuroanatomy, neurophysiology and neuropathology principles.
- To apply neuro electro physiological techniques to diagnose and manage neurological disorders.
- Students should analyses and interpret neuro electro physiological studies like EEG(Electroencephalogram), NCS (Nerve Conduction Studies) and EMG (Electromyography), EP (Evoked Potentials).
- Students' expertise to ensure the accuracy and reliability of laboratory information.
- Students gain knowledge to interpret, implements and comply with laws, regulations, standards.

PROGRAMME OUTCOME (PO)

- To assess the basic principles of neuro electro physiological techniques.
- Students should enhance patient care through accurate interpretations and recommendations. Correlate neuro electrophysiological findings with clinical presentations and diagnosis.
- Students should adhere to professional ethics, confidentiality, and patients' rights. Student should stay updated on advancements and best practices.
- Students should maintain high standards of testing quality and safety, collaborate effectively with healthcare professionals.
- The Programme will propagate the students into EEG, NCS Lab technologist, academic researchers.

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PAPER I - ANATOMY (23NP01)

COURSE OUTCOME:

- To gain information about the anatomical structure's organ in the body parts.
- To get knowledge on Human skeleton, Macroscopical structure, exact exterior location of an organ, measurement techniques.
- To attain clinical aspects, relate to study of bones, different parts of bones, digestive system, and excretory system.

Hours: Theory: 60 Hrs; Practicals:50 Hrs

CONTENT

○ GENERAL ANATOMY

- Introduction to anatomy, descriptive terms, anatomical planes, types of tissue
- Introduction to bones
- Introduction to joints
- Introduction to muscular system
- Introduction to cardiovascular system
- Introduction to nervous system

○ REGIONAL ANATOMY

- Upper extremity
- Osteology: clavicle, scapula and humerus
- Pectoral region, axilla and back
- Shoulder region, axilla including brachial plexus
- Shoulder joint
- Front of arm
- Back of arm
- Osteology: Radius, ulna, articulated hand
- Front of forearm
- Palm
- Back of forearm
- Dorsum of hand

- Elbow joint, radioulnar joints
- Wrist joint, joints of hand
- Nerve injuries, types of grip and dermatomes of upper limb

- Lower extremity
- Osteology: hip bone, femur, patella
- Front of thigh
- Medial side of thigh
- Gluteal region
- Back of thigh, popliteal fossa
- Hip joint
- Osteology: tibia, fibula, articulated foot
- Front of leg, dorsum of foot
- Back of leg
- Sole of foot
- Knee joint
- Ankle joint and joints of foot
- Thorax
- Introduction to thorax, bony thorax, dorsal vertebrae, intercostal spaces
- Joints of thorax and movements
- Mediastinum: definition, boundaries, subdivisions and contents
- Pleura, lungs
- Heart: external and internal features, blood and nerve supply
- Arch of aorta, superior vena cava, brachiocephalic vein, trachea and thymus
- Oesophagus, descending aorta, sympathetic trunk, azygos system
- Abdomen, pelvis and perineum
- Osteology: hip bone, lumbar vertebrae, sacrum
- Anterior abdominal wall, inguinal canal, male external genitalia
- Muscles of posterior abdominal wall, peritoneal cavity
- Stomach and spleen
- Duodenum and pancreas
- Liver and extrahepatic biliary apparatus
- Small and large intestines, portal vein
- Kidneys and suprarenal glands
- Aorta, inferior vena cava, lumbar plexus
- Diaphragm
- Bony pelvis, joints and walls of pelvis
- Rectum and anal canal
- Male pelvis: urinary bladder, prostate, seminal vesicles
- Female pelvis: vessels and nerves of pelvis, uterus, Fallopian tubes, ovary
- Perineum

- Head and neck
- Osteology: external features of skull, cervical vertebrae
- Face and scalp

- Posterior triangle
 - Main vessels of head and neck
 - Main nerves of head and neck
 - Parotid region and infratemporal fossa
 - Cranium and meninges
 - Cranial nerves
 - Orbit and eye
 - Ear
 - Mouth and pharynx
 - Palate, nose, larynx
-
- Neuroanatomy
 - Spinal cord: gross anatomy
 - ii. Spinal cord: tracts
 - iii. Brainstem
 - iv. Cerebellum
 - v. Cerebral hemispheres
 - vi. Diencephalon
 - vii. Basal ganglia
 - viii. Cranial nerve nuclei
 - ix. Ventricles of brain, CSF circulation
 - x. Internal capsule, commissures of brain and visual pathway
 - xi. Autonomic nervous system
 - xii. Limbic system

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PAPER II- PHYSIOLOGY (23NP02)

COURSE OUTCOME:

- To gain information about the physiological aspects of organ in the body parts.
- To get knowledge on human physiology and function. • To attain clinical aspects to analyze physiological data

Hours: Theory: 60 Hrs; Practicals:50

CONTENT

○ Cell

- Basic concepts of cell structure, components, functions, and transport

○ Skin

- Structure, functions, temperature regulation

○ Blood

- Composition and function of blood
- Red blood cells: morphology, formation, normal counts, functions
- White blood cells: morphology, formation, normal counts, functions
- Platelets: morphology, formation, normal counts, functions
- Hemoglobin: basic chemistry, function and fate of hemoglobin
- Blood clotting: definition, clotting factors, theories of clotting
- Blood group: ABO system, Rh system
- Blood volume and regulation
- Blood transfusion

○ Cardiovascular

- Structure and properties of cardiac muscle
- Cardiac cycle, conductive system, ECG
- Heart sounds
- Heart rate and regulation

- Cardiac output and regulation
 - Blood pressure and regulation
 - Regional circulation: cerebral, coronary, pulmonary, renal Effect of exercise on cardiovascular system
- Respiration
- Structure and functions of respiratory system
 - Mechanics of respiration: muscles, lungs and chest wall compliance, V/Q ratio, surfactant
 - Transport of gases: O₂ and CO₂
 - Nervous and chemical regulation of respiration
 - Hypoxia, cyanosis, and dyspnea
 - Acid base balance
 - Principles of lung function tests
 - Artificial respiration
 - Effect of exercise on respiratory system
 - Defense mechanisms
- Digestion
- Structure and function of gastrointestinal system
 - Mastication and deglutition
 - Saliva: composition, function, regulation
 - Gastric secretion: composition, phases of secretion, function
 - Pancreatic secretion: composition, function, regulation
 - Bile: composition and function
 - Movements of small and large intestine
 - Digestion in mouth, stomach, intestine
 - Defecation
- Excretion
- Structure and function of kidney
 - Structure and function of nephron
 - Formation of urine: filtration, reabsorption, secretion
- Micturition
- Endocrine
- General organization of endocrine glands
 - General metabolism: carbohydrate, fat, protein
 - Physiological actions, regulation, and disorder of hormones: adrenal, pancreatic, parathyroid, thyroid

○ Reproduction

- Male reproductive system
- Female reproductive system
- Pregnancy, function of placenta, parturition, lactation, contraception
- Puberty and menopause
- Spermatogenesis and oogenesis
- Menstrual cycle

○ Nervous system

- General organization of nervous system
- Structure, type and function of neuron
- Properties of neurons
- Synapse and synaptic transmission
- Neurotransmitters
- Reflex: properties and types
- Sensory: receptors, sensory pathway, pain pathway, referred pain, modulation of pain
- Motor: basal ganglia, cerebellum, cortex – functions and effects of lesions
- Ascending and descending pathways
- Posture and equilibrium
- Muscle tone
- Autonomic nervous system: organization and functions of sympathetic and parasympathetic nervous systems
- Cerebrospinal fluid: composition, formation, circulation, and function
- Lower motor neuron and upper motor neuron lesion.

○ Special senses

- Vision: rods and cones, retina and its function, visual pathway
- Hearing: organ of Corti, auditory pathway
- Olfaction
- Taste: taste buds

○ Muscle

- Structure of muscle: macroscopic and microscopic
- Properties of skeletal muscle
- Cardiac and smooth a)a) Overview of glucose metabolism Fat soluble vitamins (A,D,E,K) muscle
- Chemical processes involved in muscle contraction

- Motor unit and electromyography
- Effect of exercise of muscular system, exercise metabolism, respiratory system

PAPER III- BIO CHEMISTRY (23NP03)

COURSE OUTCOME:

- To gain information about the biochemical concepts, processes, and mechanism.
- To describe structure, function and metabolism of carbohydrates, lipids, proteins, and nucleic acids.
- To understand enzyme structure, function and regulation.

Hours: Theory: 60 Hrs;

Practicals:50

○ Enzymes

- Definition – Nomenclature – Classification – Factors affecting enzyme activity – Active site – Coenzyme Enzyme Inhibition – Units of enzyme – Isoenzymes – Enzyme pattern in diseases

○ Carbohydrates

- Overview of glucose metabolism
- Overview of glycogen metabolism,
- diabetes mellitus- clinical features, investigations

○ Proteins

- Classification of proteins and functions

○ Lipids

- Classification of lipids and functions

○ Vitamins

- Fat soluble vitamins (A, D, E, K)
- Water soluble vitamins – B-complex vitamins, vitamin C

○ Minerals

- Major elements Calcium, Phosphorus,
- Trace elements, Magnesium, Sodium, Potassium, Chlorine and Sulphur

○ Nutrition

- Calorific value of foods – Basal metabolic rate(BMR) – respiratory quotient(RQ) Specific dynamic action (SDA) – Balanced diet - Marasmus – Kwashiorkor, obesity, diet in DM, CVD, Kidney disease

○ Acids and bases

- Definition, pH, Henderson – Hassel balch equation, Buffers, Indicators, Normality, Molarity, Molality
- Acid base balance in the body

○ Body fluids, hormones

- Chemistry of the body fluids in health and diseases (Urine- normal and abnormal, blood/serum, CSF)
- Hormones,
- Clotting mechanisms of the blood

○ Enzymes

- Definition – Nomenclature – Classification – Factors affecting enzyme activity – Active site – Coenzyme Enzyme Inhibition – Units of enzyme – Isoenzymes – Enzyme pattern in diseases

○ Carbohydrates

- Overview of glucose metabolism
- Overview of glycogen metabolism, diabetes mellitus- clinical features, investigations

○ Proteins

- Classification of proteins and functions

○ Lipids

- Classification of lipids and functions

○ Vitamins

- Fat soluble vitamins (A, D, E, K)
- Water soluble vitamins – B-complex vitamins, vitamin C

○ Minerals

- Major elements Calcium, Phosphorus
- Trace elements, Magnesium, Sodium, Potassium, Chlorine and Sulphur

○ Nutrition

- Calorific value of foods – Basal metabolic rate(BMR) – respiratory quotient(RQ) Specific dynamic action (SDA) – Balanced diet - Marasmus – Kwashiorkor, obesity, diet in DM, CVD, Kidney disease

○ Acids and bases

- Definition, pH, Henderson – Hassel balch equation, Buffers, Indicators, Normality, Molarity, Molality
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○ Body fluids, hormones

- Chemistry of the body fluids in health and diseases (Urine- normal and abnormal, blood/serum, CSF)
- Hormones
- Clotting mechanisms of the blood