

IIND SEMESTER

ANATOMY -II

Didactic-90 Hrs + Practical/ Laboratory-60 HRS [TOTAL - 150HRS]

COURSE DESCRIPTION

The major focus of this subject is an in-depth study and analysis of the structure and function of human movement concerned with head and neck. A comprehensive study of human anatomy with emphasis on the endocrine system, lymphatic system, digestive system, genitor urinary, integumentary system are incorporated. Dissection and identification of structures in the cadaver supplemented with the study of charts, models, prosected material and radiographs are utilized to identify anatomical landmarks and configurations of the head and neck and brain.

Sr. No.	Topics	Didactic Hours	Practical/ Laboratory Hours	Total Hours
1	NEURO ANATOMY	35	20	55
2	HEAD AND NECK	20	10	30
3	CRANIAL NERVES	07	10	17
4	ENDOCRINE SYSTEM	05	-	05
5	LYMPHATIC SYSTEM	03	-	03
6	DIGESTIVE SYSTEM	04	10	14
7	GENITO URINARY SYSTEM	12	10	22
8	INTEGUMENTARY SYSTEM	04	-	04
	TOTAL	90	60	150

OBJECTIVES

Cognitive –

At the end of the training, the student should be able to –

1. Describe the gross anatomy of the human body and correlate the knowledge of structure and function of Head and neck.
2. Describe the cross section anatomy of the human body and correlate the knowledge of structure and function of Head and neck.
3. Interpret the anatomical basic of symptoms and signs of clinical conditions, diagnostic procedures and treatment modalities related to of Head and neck, endocrine system, lymphatic system, digestive system, genitor urinary, integumentary system
4. Describe the development aspects of human body and interpret the development basis of various congenital anomalies of Head and neck and Nervous system.

5. Describe the neuro anatomy in its entirety and interpret the neuro anatomical basis of various clinical conditions of Head and neck, Nervous system, endocrine system, lymphatic system, digestive system, genitor urinary, integumentary system.

Psychomotor

At the end of the training, the student should be able to –

1. Dissect and demonstrate various parts of head, neck, brain and spinal cord.
2. Demonstrate the anatomical significance of nerves and blood vessels of human body.
3. Prepare and deliver lectures on various topics of human anatomy using audio – visual aids.
4. Present paper / poster in conference emphasizing on the anatomy and clinical anatomy

Affective

At the end of training the student should be able to -

The student should be able to correlate the knowledge of anatomy and its application in the physiotherapy profession during patient evaluation and treatment.

SYLLABUS

Sr. No.	Topics	Didactic Hours	Practical/ Laboratory Hours	Total Hours
1	NEURO ANATOMY	35	20	55
	<ul style="list-style-type: none"> • Definition of Neuron • Organization of Nervous system along with division central, peripheral autonomic. • Anterior and posterior triangles of the neck - subdivisions and contents. • Development of brain and spinal cord in embryonic level. <p>Spinal cord: - Position, extent transectional view. Tracts of spinal cord and their extent Reflex levels at spinal cord. Blood supply Effects of injury, prognosis and applied anatomy Rhombencephalon or hind brain Medulla Oblongata Pons Cerebellum parts of cerebellum Internal cerebellar structures Various afferent and efferent tracts and their respective terminations. Results of damage to cerebellum and prognosis and applied anatomy</p> <ul style="list-style-type: none"> • Reticular formation • Forebrain or cerebrum gross components Knowledge of gyri, sulci and cortical areas Association fibres, projection fibers and commissural fibers. <ul style="list-style-type: none"> • cerebral cortex • fornix • ancus • insula <p>Limbic lobe and factory pathways Meninges Internal capsule, basal ganglia, thalamus, hypothalamus – Role and effects of injury and applied anatomy</p> <p>Pyramidal motor system and its tracts. Upper and lower motor neurons Parts and tracts of extra pyramidal system and its functions and applied anatomy Nature and basis of muscle tone</p>			

	<p>Autonomic nervous system sympathetic, parasympathetic</p> <p>Anatomy of Cranial nerves and applied anatomy</p> <p>Peripheral apparatus of special senses</p> <ul style="list-style-type: none"> • Reflex levels of organization • Controlling levels of organization • Blood supply • Arteries of the brain. • Blood supply to the cerebrum/circle of willis • Blood brain barrier • Subdural hemorrhage, subarachnoid, extradural hemorrhage • Result of occlusion • CSF <p>Formation, circulation and drainage</p> <p>Lumbar puncture and cisternal puncture and applied anatomy</p>			
2	HEAD AND NECK	20	10	30
	<ul style="list-style-type: none"> • Discussion about the musculoskeletal and neurovascular features. • Anterior and posterior triangles of the neck with its substitutions. • Anatomy of large skull bones and their parts <p>Anatomy of main muscles of the face nerve supply and action and applied anatomy</p> <ul style="list-style-type: none"> • • Temporomandibular joint articulation muscles and movements. • Paralysis of facial muscles – causes of injury to facial nerve and sequel of injury and applied anatomy • Anatomy of trigeminal nerve on the face • Anatomy and general features of typical cervical vertebra, atlas, axis and seventh cervical vertebra. • Anatomy of Main muscles of the cervical region attachments, actions and nerve supply. • Anatomy of phrenic, accessory and vagus Nerves • Joints of the cervical region–type, articular surfaces, ligaments, movements and muscles producing these movements. <ul style="list-style-type: none"> • EYE: <ul style="list-style-type: none"> • Structure of eye, subdivisions and chambers • Retina & Optic pathway • Light and accommodation reflex • Nerve supply & action of extraocular muscles. • NOSE: 			

	<ul style="list-style-type: none"> • Bony components of nose • Parts and boundaries of nose and features of nasal cavity. • EAR: • Basic structure of ear: hearing & equilibrium • Nerve endings for hearing and equilibrium 			
3	CRANIAL NERVES	10	07	17
	Anatomy of cranial nerves Nucleus of origin and termination attachments to the brain and cranial exit, its relations Sensory and motor distribution applied anatomy			
4	ENDOCRINE SYSTEM	05		05
	Endocrine organs and their position Functions of hormones produced by each endocrine organ. Applied anatomy			
5	LYMPHATIC SYSTEM	03		03
	Comprehend the general and regional arrangements of the lymphatic system Functions of Lymphatic system Structures of Lymph nodes, Lymph vessels. Applied anatomy			
6	DIGESTIVE SYSTEM	04	10	14
	Anatomy of digestive system Special features of mouth, teeth and muscles of the pharynx. Position, course and extent of the oesophagus Position and gross structure of stomach, nerve supply and chief functions. Subdivisions of the intestines and mention their surface anatomy Distinguish between the small and the large intestine Chief arterial branches of the abdominal aorta. Position and gross features of the liver & Biliary system Position of pancreas & spleen Hernias in stomach and intestinal levels. Treatments and prognosis and applied anatomy			
7	GENITO URINARY SYSTEM	12	10	22
	Basic structure, functional anatomy of kidney Distinguish between right & left kidney – position, size & shape Anatomy and Structure of Nephron Anatomy of bladder, Uterus, Urethra Basic innervation of bladder Anatomy of male reproductive system Anatomy and functional considerations of the reproduction and external organs. Anatomy of female reproductive system			

	anatomy and functional considerations of ovary, uterine tubes, uterus, vagina and female external genitalia. Anatomy of the uterus, causes for prolapse, factors responsible for maintenance of its position, applied anatomy Discuss course of external and internal iliac arteries its applied anatomy			
8	INTEGUMENTARY SYSTEM	04	-	04
	Anatomy, Structure and layers of skin Blood circulation of skin Sweat and sebaceous glands – location, function and its applied anatomy			
	Total	90	60	150

PRACTICAL ANATOMY

- a) Head & Spinal cord and Neck and Brain including surface Anatomy cranial nerves, spinal nerves and important blood vessels.
- b) Points of palpation of nerves and arteries.

Practical procedure:

- a) Learning through charts models and specimens.
- b) Identification and location of systems in models and cadaver
- c) Location of anatomical parts in dissected cadaver
- d) Identification of specimens

Reference:

1. Clinical neuro anatomy for medical students – Snell 6th edition
2. Human anatomy – B.D. Chaurasia's
3. Clinical anatomy for medical students – Snell 6th edition
4. Text book of human neuroanatomy – Inderbir Singh
5. Gray's anatomy 37th edition edited by – Peter L. Williams, Mary Dyson
6. Text book of human anatomy by T.S. Ranganathan

Recommended Text books:

1. Gray's anatomy 37th edition edited by – Peter L. Williams, Mary Dyson
2. Text book of human anatomy by T.S. Ranganath
3. SNELL [Richard S], Clinical Anatomy for Medical students : Ed. 6. Little Brown and Company, Boston. 1995, p898,
4. B.D Chaurasia's Human Anatomy – Regional And Applied; Volume I, Volume Ii And Volume
5. MOORE [Kieth L], Clinically Oriented Anatomy. Ed.3., Williams and Wilkins, Baltimore, 1992, p917
6. DATTA [A.K], Essentials of human Anatomy: Head and Neck Ed 2. Vol. II, Current Book International, Calcutta 1995, p363,

7. SINGH [Inderbir], Text book of Anatomy with colour atlas: Introduction, Osteology, UpperExtremity, Lower Extremity. Vol I. P Brothers, New Delhi 1996,
8. SINGH [Inderbir], Text book of Anatomy with colour Atlas: Head and Neck Central NervousSystem. Vol III. JP Brothers, New Delhi 1996.

Practicals

1. ROMANES [G J], Cunningham manual of practical anatomy : Head and Neck and Brain ed
2. 15 Vol II Oxford Medical Publication, Oxford 1996, P346

SCHEME OF UNIVERSITY EXAMINATION

THEORY	Marks
*The question paper will give appropriate weightage to all the topics in the syllabus	100
Essay Q1-Essay-15 Marks Q2-Essay-15 Marks	30
Short Notes Answer all the questions 10x5=50 10 questions- 5 marks each	50
Short Answer questions Answer all the questions 10x2=20 10 questions- 2 marks each	20
Total	100

PRACTICALS /VIVA VOICE-50 Marks	Maximum Marks
Total	50

INTERNAL ASSESSMENT: (50marks)

Internal assessment (Theory and Practical) as per University pattern

PHYSIOLOGY-II

Didactic-90 Hrs + Practical/ Laboratory-60 HRS [TOTAL - 150HRS]

COURSE DESCRIPTION

The course is designed to study the function of the nervous system. The major emphasis is placed on special senses, reproductive system, digestive system, renal and endocrine system.

Sr. No.	Topics	Didactic Hours	Practical/ Laboratory Hours	Total Hours
1	Nervous System	40	35	75
2	Special senses	15	25	40
3	Renal System	15	-	15
4	Endocrine System	20	-	20
TOTAL		90	60	150

Learning Objectives

Cognitive

- 1) To understand the functional mechanisms of nervous system, reproductive system, digestive system, renal and endocrine system.
- 2) To understand interaction and integration of reproductive system, digestive system, renal and endocrine system.
- 3) To understand the functions and dysfunctions of reproductive system, digestive system, renal and endocrine system.

Psychomotor

- 1) To be able to perform general clinical examination.
- 2) To be able to perform specific clinical examination to assess sensation, motor system and cranial nerves.
- 3) To be efficient to handle the equipment related to these tests.
- 4) To be able to derive, analyze, interpret the test results.

5) To be able to present the facts in a precise manner regarding knowledge and Skill acquired

Affective Domain

At the end of training the student should be able to -

The student should be able to correlate the knowledge of physiology and its application in the physiotherapy profession.

SYLLABUS

S.No	Topic	Didactic hours	Practical/ Laboratory hours	Total hours
1	Nervous System	40	35	75
	<p>Introduction: Organization of CNS – central and peripheral nervous system. Functions of nervous system. Synapse: Functional anatomy, classification, Synaptic transmission. Properties. Sensory Mechanism: Sensory receptors: function, classification and properties. Sensory pathway: The ascending tracts – Posterior column tracts, lateral spinothalamic tract and the anterior spinothalamic tract – their origin, course, termination and functions. The trigeminal pathway. Sensory cortex. Somatic sensations: crude touch, fine touch, tactile localization, tactile discrimination, stereognosis, vibration sense, kinesthetic sensations. Pain sensation: mechanism of pain. Cutaneous pain – slow and fast pain, hyperalgesia. Deep pain, Visceral pain – referred pain. Gate control theory of pain. tabes dorsalis, sensory ataxia.</p> <p>Motor Mechanism: Motor Cortex, Motor pathway: The descending tracts – pyramidal tracts, extrapyramidal tracts – origin, course, termination and functions. Upper motor neuron and lower motor neuron. Paralysis, monoplegia, paraplegia, hemiplegia and quadriplegia.</p> <p>Reflex Action: components, Bell-Magendie law, classification and Properties. Monosynaptic and polysynaptic reflexes, superficial reflexes, deep reflexes. Stretch reflex – structure of muscle spindle, pathway, higher control and functions. Inverse stretch reflex. Muscle tone – definition, and properties hypotonia, atonia and hypertonia. UMNL and LMNL</p> <p>Spinal cord Lesions: Complete transection and Hemisection of the spinal cord.</p>			

	<p>Cerebellum: Functions. Cerebellar ataxia. Posture and Equilibrium: Postural reflexes – spinal, medullary, midbrain and cerebral reflexes.</p> <p>Thalamus and Hypothalamus: Nuclei. Functions. Thalamic syndrome</p> <p>Reticular Formation and Limbic System: Components and Functions.</p> <p>Basal Ganglia: Structures included and functions. Parkinson's disease.</p> <p>Cerebral Cortex: Lobes. Brodmann's areas and their functions. Higher functions of cerebral cortex – learning, memory and speech.</p> <p>EEG : Waves and features. Sleep: REM and NREM sleep.</p> <p>CSF: Formation, composition, circulation and functions.</p> <p>Lumbar puncture and its significance.</p> <p>Blood brain barrier. Hydrocephalus.</p> <p>ANS: Features and actions of parasympathetic and sympathetic nervous system.</p>						
2	Special Senses	15	20	25	30	40	30
	<p>Vision: Introduction: Functional anatomy of eyeball. Functions of cornea, iris, pupil, aqueous humor – glaucoma, lens – cataract, vitreous humor, rods and cones. Photopic vision. Scotopic vision. Visual Pathway and the effects of lesions. Refractive. Errors: myopia, hypermetropia, presbyopia and astigmatism.</p> <p>Visual Reflexes: Accommodation, Pupillary and Light. Visual acuity and Visual field. Light adaptation. Dark adaptation. Color vision – color blindness. Nyctalopia</p> <p>Audition: Physiological anatomy of the ear. Functions of external ear, middle ear and inner ear. Structure of Cochlea and organ of Corti. Auditory pathway. Types of Deafness. Tests for hearing. Audiometry</p> <p>Taste: Taste buds. Primary tastes. Gustatory pathway</p> <p>Smell: Olfactory membrane. Olfactory pathway. Vestibular Apparatus: Crista ampullaris and macula. Functions. Disorders</p>						
3	Renal System	15	-			15	
	<p>Introduction: Physiological anatomy.</p> <p>Nephrons: Cortical and juxtamedullary. Juxtaglomerular apparatus. Glomerular membrane. Renal blood flow and its regulation. Functions of kidneys.</p> <p>Mechanism of Urine Formation: Glomerular Filtration: Mechanism of glomerular filtration. GFR – normal value and factors affecting. Renal clearance. Inulin clearance.</p>						

	<p>Creatinine clearance.</p> <p>Tubular Reabsorption: Reabsorption of Na+glucose, HCO₃ urea and water.</p> <p>Filtered load., Renal tubular transport maximum.</p> <p>Glucose clearance: TmG. Renal threshold for glucose.</p> <p>Tubular Secretion: Secretion of H⁺ and K⁺. PAH clearance.</p> <p>Mechanism of concentrating and diluting the Urine: Counter-current mechanism.</p> <p>Regulation, of water excretion. Diuresis. Diuretics.</p> <p>Micturition: Mechanism of micturition.</p> <p>Cystometrogram. Atonic bladder, automatic bladder.</p> <p>Acid-Base balance (very brief)</p> <p>Artificial Kidney: Principle of haemodialysis.,</p> <p>Skin and temperature regulation.</p>			
4	Endocrine System	20		20
	<p>Introduction: Major endocrine glands. Hormone: classification, mechanism of action. Functions of hormones</p> <p>Pituitary Gland: Anterior Pituitary and Posterior Pituitary hormones: Secretory cells, action on target cells, regulation of secretion of each hormone. Disorders: Gigantism, Acromegaly, Dwarfism, Diabetes insipidus. Physiology of growth and development: hormonal and other influences. Pituitary-Hypothalamic Relationship.</p> <p>Thyroid Gland: Thyroid hormone and calcitonin: secretory cells, synthesis, storage, action and regulation of secretion.</p> <p>Disorders: Myxoedema. Cretinism, Grave's disease</p> <p>Parathyroid hormones: secretory cell, action, regulation of secretion. Disorders: Hypoparathyroidism. Hyperthyroidism.</p> <p>Calcium metabolism and its regulation. Adrenal Gland: Adrenal Cortex: Secretory cells, synthesis, action, regulation of secretion of Aldosterone, Cortisol, Androgens.</p> <p>Disorders: Addison's disease, Cushing's syndrome, Conn's syndrome, Adrenogenital syndrome.</p> <p>Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and noradrenaline.</p> <p>Disorders: Pheochromocytoma.</p> <p>Endocrine Pancreas: Secretory cells, action, regulation of secretion of insulin and glucagon. Glucose metabolism and its regulation.</p> <p>Disorder: Diabetes mellitus. Calcitonin, Thymus and Pineal gland (very brief).</p> <p>Local Hormones. (briefly).</p>			
	Total	90	60	150

Practical

I. Clinical Examination

1. Examination of Sensory system
2. Examination of Motor System
3. Examination of reflexes
4. Examination of cranial nerves
5. Examination of Cerebral and Cerebellar functions
6. Perimetry

RECOMMENDED TEXT BOOKS

1. Basics of medical Physiology -3rd edition D.Venkatesh.Sudhakar
2. Ganongs Review of Medical Physiology 24th edition
3. Fundamentals of medical Physiology Prakasam reddy 5th edition
4. Text book for physiology-A.K.Jain

RECOMMENDED REFERENCE BOOKS

1. Review of Medical Physiology – Ganong
2. Samson & Wright's Applied Physiology
3. Textbook of Medical Physiology – Bern and Levy

SCHEME OF UNIVERSITY EXAMINATION

THEORY	Marks
*The question paper will give appropriate weightage to all the topics in the syllabus	100
Essay Q1-Essay-15 Marks Q2-Essay-15 Marks	30
Short Notes Answer all the questions 10x5=50 10 questions- 5 marks each	50
Short Answer questions Answer all the questions 10x2=20 10 questions- 2 marks each	20
Total	100

PRACTICALS /VIVA VOICE-50 Marks	Maximum Marks
Total	50

INTERNAL ASSESSMENT: (50marks)

Internal assessment (Theory and Practical) as per University pattern

BIOCHEMISTRY AND EXERCISE PHYSIOLOGY

Didactic-60 +60 Hrs[TOTAL - 120HRS]

COURSE DESCRIPTION :(BIOCHEMISTRY)

This course provides the knowledge and skills in fundamental organic chemistry and introductory biochemistry that are essential for further studies. It covers basic biochemical, cellular, biological and microbiological processes, basic chemical reactions in the prokaryotic and eukaryotic cells, the structure of biological molecules, introduction to the nutrients i.e. carbohydrates, fats, enzymes, nucleic acids and amino acids.

COURSE DESCRIPTION : (EXERCISE PHYSIOLOGY)

Students will develop an understanding of pathology underlying clinical disease states and involving the major organ systems and epidemiological issues. Epidemiological issues will be presented and discussed. Students will learn to recognize pathology signs and symptoms considered red flags for serious disease. Students will use problem-solving skills and information about pathology to decide when referral to another health care provider or alternative intervention is indicated. Students will develop the ability to disseminate pertinent information and findings, and ascertain the appropriate steps to follow.

S. NO	TOPIC	Didactic hours	Total hours
1	CARBOHYDRATES	7	7
2	PROTEINS	6	6
3	LIPIDS	6	6
4	ENZYMES	5	5
5	NUCLEOTIDE AND NUCLEIC ACID	3	3
6	VITAMINS	7	7
7	MINERALS	4	4
8	HORMONES	3	3
9	NUTRITION	3	3
10	MUSCLE CONTRACTION	5	5
11	ACID-BASE BALANCE	2	2
12	WATER BALANCE	3	3
13	ELECTROLYTE BALANCE	2	2
14	CLINICAL BIOCHEMISTRY	4	4
	TOTAL	60	60

Course objective:

Cognitive -

1. List the structure, function and assimilation of macro and micro nutrients.
2. Describe the abnormalities associated with pathological condition with respect conception, absorption and assimilation of various macro and micro nutrients.

3. Enumerate the biochemistry of connective tissue, collage glycoprotein, proteoglycans, elastin and keratin.
4. Biochemical aspects of muscle contraction.

Psychomotor: Draw and label various stages involved in different metabolic cyclic reactions like Kreb's cycle, Glycogen metabolism etc.

Affective:

At the end of training the student should be able to -

The student should be able to correlate the knowledge of biochemistry and its significance in various conditions handled by the physiotherapy profession.

SYLLABUS

S. NO	TOPIC	Didactic hours	Practical/ Laboratory hours	Total hours
1	CARBOHYDRATES	7	-	7
	a) Chemistry, Definition, Classification with b) Examples and Functions c) Glycolysis, TCA cycle, Glycogen metabolism, Glycogen storage disorder, Diabetes Mellitus and glycosuria d) Hormonal regulation of blood glucose, e) HbA1C and GTT			
2	PROTEINS	6	-	6
	a) Definition, Importance, Functional Classification of proteins decarboxylation, deamination, transamination, transmethylation, Urea Cycle, clinical significance of serum urea. Special products formed from glycine, Phenylalanine, tryptophan, methionine tyrosine. b) There should be an emphasis on understanding the structure of protein, the essential and non-essential amino acids.			
3	LIPIDS	6	-	6
	a) Definition, classification, properties and functions of Fatty acids, Triacylglycerol, Phospholipids, Cholesterol, Essential fatty acids and their importance. b) Lipoproteins: Definition, classification, properties, Sources and function, Ketone bodies c) Introduction to lipid metabolism, Lipolysis, Oxidation of fatty acids b-oxidation of fatty acids, d) De Novo Lipogenesis –synthesis of fatty acids, chain elongation, Desaturation, triacylglycerol synthesis, fat metabolism in adipose tissues e) Ketone body metabolism: Ketone body formation (ketogenesis), utilization (ketolysis), ketosis, Rothera's test			
4	ENZYMES	5	-	5

	Definition, Modern Classification, Factors affecting enzymes Action, diagnostic & therapeutics uses & enzymes, Isoenzymes, Competitive & Non competitive inhibition.			
5	NUCLEOTIDE AND NUCLEIC ACID	3	-	3
	Nucleotide chemistry: Nucleotide composition, functions of free nucleotides in body. Nucleic acid (DNA and RNA) chemistry: Difference between DNA and RNA, Structure of DNA (Watson and Crick model) and Functions of DNA, Structure and functions of tRNA, rRNA, mRNA.			
6	VITAMINS	7	-	7
	Definition, classification according to solubility, Individual vitamins - Sources, Coenzyme forms, functions, RDA, digestion, absorption and transport, deficiency manifestations and toxicity			
7	MINERALS	4	-	4
	Definition, Sources, RDA, Digestion, absorption, transport, excretion, functions, disorder of Individual minerals - Calcium, phosphate, iron, Magnesium, fluoride, selenium, molybdenum, copper, Phosphate, calcium and iron in detail			
8	HORMONES	3	-	3
	Definition, classification, Mechanism of various hormones action, Receptors, signal transduction, second messengers and cell function			
9	NUTRITION	3	-	3
	Composition of food, balanced diet, Kwashiorkar, Marasmus, Nitrogen balance, major Dietary constituent & their importance. Include energy requirements, factors affecting B.M.R., S.D.A. (Specific Dynamic Action) and R.Q. (Respiratory Quotient)			
10	MUSCLE CONTRACTION	5	-	5
	Contractile elements in muscle, biochemical process of muscle contraction, Energy for muscle contraction Biochemistry of connective tissue Collagen-Glyco-proteins, Proteoglycans, Elastin, Keratin.			
11	ACID-BASE BALANCE	2	-	2
	Acids, bases and buffers, Role of pH in acid-base balance, Buffer systems of the body: bicarbonate buffer system. Role of lungs and kidneys in acid base balance, Acid base imbalance			
12	WATER BALANCE	3	-	3
	Water distribution in the body, Body water, water turnover, Regulation of water balance: role of ADH and thirst centre			
13	ELECTROLYTE BALANCE	2	-	2
	Define Osmolarity. Distribution of electrolytes, Role of aldosterone, rennin angiotensin system in Electrolyte balance.			
14	CLINICAL BIOCHEMISTRY	4	-	4
	TOTAL	60	-	60

RECOMMENDED TEXT BOOKS

1. Biochemistry – Dr. Satyanarayan
2. Text book of Biochemistry for Medical students – Dr. Vasudevan / Shri Kumar
3. Biochemistry – Dr. Pankaja Naik

RECOMMENDED REFERENCE BOOK

1. Review of Biochemistry (24th edition) – Harp

INTERNAL ASSESSMENT: (25marks)

1. Internal assessment (Theory and Practical) as per University pattern

COURSE DESCRIPTION : (EXERCISE PHYSIOLOGY)

Students will develop an understanding of pathology underlying clinical disease states and involving the major organ systems and epidemiological issues. Epidemiological issues will be presented and discussed. Students will learn to recognize pathology signs and symptoms considered red flags for serious disease. Students will use problem-solving skills and information about pathology to decide when referral to another health care provider or alternative intervention is indicated. Students will develop the ability to disseminate pertinent information and findings, and ascertain the appropriate steps to follow.

S. N	TOPIC	Didactic hours	Total hours
1	Energy Transfer in Body and Exercise	7	7
2	Estimation and measurement of energy expenditure	5	5
3	Adaptations to Anaerobic Training Programs	7	7
4	Adaptations to Aerobic Endurance Training Programs	7	7
5	Environmental stress	4	4
	TOTAL	30	30

Course objective:

Cognitive -

1. List the structure, function and assimilation of macro and micro nutrients.
2. Describe the abnormalities associated with pathological condition with respect conception, absorption and assimilation of various macro and micro nutrients.
3. Enumerate the biochemistry of connective tissue, collage glycoprotein, proteoglycans, elastin and keratin.
4. Biochemical aspects of muscle contraction.

Psychomotor: Draw and label various stages involved in different metabolic cyclic reactions like Krebs's cycle, Glycogen metabolism etc.

Affective:

At the end of training the student should be able to -

The student should be able to correlate the knowledge of biochemistry and its significance in various conditions handled by the physiotherapy profession.

SYLLABUS

S. NO	TOPIC	Didactic hours	Practical/Laboratory hours	Total hours
1	Energy Transfer in Body and Exercise	7	-	7
	Bio energetic, ATP-CP System, Glycolysis, Krebs's cycle and Electron transport chain, Lactate Production, OBLA, O ₂ debt, O ₂ deficit & VO ₂ max			
2	Estimation and measurement of energy expenditure	5	-	5
	Exercise intensity, exercise expenditure, oxygen cost, calorie cost, and metabolic equivalent.			
3	Adaptations to Anaerobic Training Programs	7	-	7
	Neural Adaptations, Muscular Adaptations Connective Tissue Adaptations, Endocrine Responses and Adaptations to Anaerobic Training , Cardiovascular and Respiratory Responses to Acute Exercise, Compatibility of Aerobic and Anaerobic Modes of Training , Overtraining, Detraining			
4	Adaptations to Aerobic Endurance Training Programs	7	-	7
	Acute Responses to Aerobic Exercise , Chronic Adaptations to Aerobic Exercise , Designing Aerobic, Endurance Programs for Optimizing Adaptations , External Influences on the Cardio respiratory Response , Individual Factors Influencing Adaptations to Aerobic Endurance Training			
5	Environmental stress:	4	-	4
	Exercise at Medium, High Altitude and Thermal Stress			
	TOTAL	30	-	30

RECOMMENDED TEXT BOOKS

4. Biochemistry – Dr. Satyanarayan
5. Text book of Biochemistry for Medical students – Dr. Vasudevan / Shri Kumar

6. Biochemistry – Dr. Pankaja Naik

RECOMMENDED REFERENCE BOOK

2. Review of Biochemistry (24th edition) – Harp

SCHEME OF UNIVERSITY EXAMINATION

THEORY	Marks
*The question paper will give appropriate weightage to all the topics in the syllabus	100
Essay Q1-Essay-15 Marks Q2-Essay-15 Marks	30
Short Notes Answer all the questions 10x5=50 10 questions- 5 marks each	50
Short Answer questions Answer all the questions 10x2=20 10 questions- 2 marks each	20
Total	100

Section Separation and Marks Distribution:

Section A – Biochemistry - 70 Marks

Section B – Exercise Physiology - 30 Marks

Question Paper Pattern:

Section A: Biochemistry (Total Marks: 70)

S. No	Description	No. of Questions	Marks Allotted	Total Marks (70)
1.	Essay	01	15	15
2.	Short Notes	09	05	45
3.	Short Answer Questions	05	02	10

Section B – Exercise Physiology (Total Marks: 30)

S. No	Description	No. of Questions	Marks Allotted	Total Marks (30)
1.	Essay	01	15	15

2.	Short Notes	01	05	05
3.	Short Answer Questions	05	02	10

INTERNAL ASSESSMENT: (25marks)

2. **Internal assessment (Theory and Practical) as per University patter**

INFORMATION AND COMMUNICATION TECHNOLOGY

IN HEALTH EDUCATION (Non-credit)

Didactic-45 Hrs + Practical/ Laboratory-45 HRS [TOTAL - 90HRS]

Learning objectives

Upon successful completion of this subject, students should

1. To obtain the basic knowledge on computer, devices used in computers.
2. To know the uses of computers like MS office, Power point Presentations, Excel documents.
3. To know about uses of internet, its advantages in regular updating the knowledge in physiotherapy profession.

S.No	Topic	Didactic hours	Practical/ Laboratory hours	Total hours
1	Introduction	45	45	90
2	The Digital Age			
3	Applications Software			
4	Storage Devices			
5	Communications			
6	Multimedia			
7	Radio propagation			
	TOTAL	45	45	90

SYLLABUS

Sr. No.	Topics	Didactic Hours	Practical/ Laboratory Hours	Total Hours
1	Introduction	10	-	10
	1. Introduction to computers-History of Computer, Generation of Computer, Classification of Computers, Input Devices, Output Devices, Central Processing Unit, Components of CPU, Memory Unit, Peripheral Devices 2. Introduction to M.S. Windows 3. Internet and its applications 4. Saveetha web forum & portal 5. Google Applications 6. Introduction to M.S. Office - Word, Power Point, Excel, Publisher			

2	The Digital Age	05	05	10
	Computer and communications, the five operations of a computer-and communication system- input, processing, output, storage and communications as well as the corresponding categories of hardware, five major categories of computers, development I communication Technology.			
3	Applications Software	10	20	30
	Applications and systems software, ethics of copying software, four types of applications software, entertainment education and reference, productivity and business and specialized, key functions of word processors, spreadsheets, database managers, graphics programs and suites, group-ware, and internet web browsers.			
4	Storage Devices	05	05	10
	Units of storage capacity, primary and secondary storage, data compression, data storage on diskette, hard disks, optical disks, and magnetic tape and describe the purposes of storage media.			
5	Communications	05	05	10
	Usage of communications technology, telephone-related services, online information services, the internet			
6	Multimedia	05	05	10
	What is multimedia – Multimedia PC– Multimedia Hardware - Central processor – color display, Multimedia accessories – CD ROM – Digital Audio – Audio speakers – Digital video – MIDI – deodisc Read/write storage device- Multimedia software			
7	Radio propagation:	05	05	10
	Use of computers in physical therapy – Application Packages used in statistical analysis.			
	Total	45	45	90

Recommended books

1. Free T. Hotstetter, —Multimedia Literacyl M<egraw Hill,
2. Simon J. Gibbs, Dinoysios C. Tschritziz, —Multimedia programmingl, Addison Wesley
3. John F.Koefgel Buford, —Multimedia Systemsl, Addison Wesley
4. John Vince, —Virtual Reality Systemsl Addison Wesley.
5. AndressF.Molisch, —Wideband Wireless digital communicationl Pear Education Asia

INTERNAL ASSESSMENT:

1. Internal assessment as per University pattern

INTRODUCTION TO PHYSIOTHERAPY (Non-Credit)

Didactic 30hrs -total 30hrs

Course Objective:

1. Acquire the geographical orientation of the various concerned sections of the college & the clinical training areas
2. Learn the Bed-side manners, General Ethical code & discipline of the Department
3. Acquire the skill of History taking in general
4. It is aimed at helping the students to acquire knowledge, understanding and skills in physiotherapy techniques in clinical settings.

THEORY

I. Patterns of Health Care Delivery:

- a. National Trends and resources
- b. Local trends and resources
- c. Overview of Health Science Professions

II. Components of Physiotherapy Profession:

- a. History of Medical Therapeutics
- b. History of Physiotherapy
- c. Overview of Health Science Professions

III. Role of Physiotherapy in meeting Health Care Needs in India:

- a. Needs versus Demands
- b. Physiotherapist as 'Educator'
- c. Typical Job settings
- d. Common problems and solutions