# FIRST YEAR BPTh SYLLABUS

## Transcript Hours-1400

| SR.NO | SUBJECT & CODE | TOPIC | | DIDACTIC HRS |
|---|---|---|---|---|
| 1 | PROFESSIONAL PRACTICE & ETHICS P101 | 1 | Introduction to the history of Physiotherapy | 15 |
| | | 2 | Orientation to the curriculum, clinical areas and geographical location | |
| | | 3 | Concept of morality and ethics | |
| | | 4 | Concept of professionalism and Professional dress code | |
| 2 | ANATOMY P102 | 1 | General Anatomy And Histology | 212 |
| | | 2 | Musculoskeletal System | |
| | | 3 | Neuro Anatomy | |
| | | 4 | Systemic Anatomy | |
| | | 5 | Cardio Vascular & Respiratory Anatomy | |
| | | 6 | Abdomen | |
| | | 7 | Sensory Organs | |
| | | 8 | Endocrine & Exocrine System | |
| | | 9 | Radiology | 200 |
| 3 | PHYSIOLOGY P103 | 1 | General Physiology | |
| | | 2 | Nervous System | |
| | | 3 | Excretory System | |
| | | 4 | Temperature Regulation | |
| | | 5 | Endocrine System | |
| | | 6 | Reproductive System | |
| | | 7 | Special Senses | |
| | | 8 | Respiratory System | |
| | | 9 | Cardiovascular System | |
| | | 10 | Gastro Intestinal System | |
| | | 11 | Exercise Physiology | |
| | | 12 | Physiology Of Ageing | |
| 4 | BIOCHEMISTRY P104 | 1 | Carbohydrates | 54 |
| | | 2 | Proteins | |
| | | 3 | Enzymes | |
| | | 4 | Vitamins | |
| | | 5 | Minerals | |
| | | 6 | Hormones | |
| | | 7 | Nutrition | |

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|---|---|---|---|---|
| | | 8 | Clinical Biochemistry | |
| | | 9 | Lipid | |
| | | 10 | Muscle Contraction | |
| **5** | **FUNDAMENTALS OF KINESIOLOGY & KINESIOTHERAPY P105** | 1 | Mechanics & Basic Biomechanics | 250 |
| | | 2 | Bio-Physics Related To Kinesiotherapy | |
| | | 3 | Classification Of Movements | |
| | | 4 | Basic Evaluation | |
| | | 5 | Massage | |
| | | 6 | Relaxation | |
| | | 7 | Aerobic Exercise | |
| | | 8 | Yoga | |
| **6** | **FUNDAMENTALS OF ELECTROTHERAPY P106** | 1 | Medical Electronics And Electricity | 200 |
| | | 2 | Electrical Modalities | |
| | | 3 | Superficial Thermal Agents | |
| **7** | **SEMINAR** | 1 | Seminar ( applied to Anatomical structures and Physiological functions, Fundamentals of Kinesiology & Kinesiotherapy, Fundamentals of Electrotherapy ) | 69 |
| **8** | **OBSERVATIONAL CLINICAL PRACTICE** | 1 | He/she shall observe and no technical aspects of fixation of electrotherapeutic modalities, basic movements and starting positions used, learn bedside manners and communication skills with the seniors, peers and patients | 400 |

# PROFESSIONAL PRACTICE AND ETHICS - P101

**Total 15hrs**

**(COLLEGE EXAMINATION IN FINAL YEAR)**

**COURSE DESCRIPTION:**

This subject will be taught in continuum from first year to final year. An exam will be conducted only in final year. Professional and ethical practice curriculum content addresses the Knowledge, Skills and Behaviors required of the physiotherapist in a range of practice relationships and roles. The course will discuss the role, responsibility, ethics and administration issues and accountability of the physical therapists. The course will also cover the history and change in the profession, responsibilities of the professional to the profession, the public and to the health care team. This includes the application of professional and ethical reasoning decision-making strategies and professional communication.

**COURSE OBJECTIVES:**

At the end of the course, the student will be compliant in following domains:

**Cognitive:** The student will -

- Be able to understand the moral values and meaning of ethics.
- Acquire bed side manners and communication skills in relation with patients, peers,seniors and other professionals.

**Psychomotor:** The student will be able to -

- Develop psychomotor skills for physiotherapist-patient relationship.

| SR.NO | TOPIC | HRS | SUPERVISION HOURS |
|---|---|---|---|
| 1 | Introduction to the history of Physiotherapy | 2 | 05 |
| 2 | Orientation to the curriculum, clinical area sand Geographical location | 3 | |
| 3 | Concept of morality and ethics | 3 | |
| 4 | Concept of professionalism and Professional Dress code | 2 | |

# HUMAN ANATOMY- P102

**Theory 150hrs+ Practical/Laboratory 62hrs = Total-212hrs**

**(UNIVERSITY EXAMINATION)**

**COURSE DESCRIPTION:**

The focus of this course is an in-depth study and analysis of the regional and systemic organization of the body. Emphasis is placed up on structure and function of human movement. A comprehensive study of human anatomy with emphasis on the nervous, musculoskeletal and circulatory systems is incorporated. Introduction to general anatomy lays the foundation of the course. Dissection and identification of structures in the cadaver supplemented with the study of charts, models, prosecuted material and radiographs are utilized to identify anatomical landmarks and configurations.

**COURSE OBJECTIVES**:

At the end of the course, the candidate will be able to

**Cognitive:**

- Acquire the knowledge of Anatomical aspects of muscles, bones, joints, theirattachments & to understand and analyses movements.
- Acquire the knowledge of anatomy on the living (living anatomy).
- Acquire the knowledge of the Anatomical basis of various clinical conditions.
- Able to identify various parts of nervous system.
- Understand the circulation blood of C.N.S. & spinal cord.
- To identify the course of peripheral nerve.
- Acquire the knowledge of various structures of the Cardio Vascular & Respiratorysystem and the course of blood vessels
- Identify and describe various structures of Thoracic cage and mechanisms of Respiration
- Able to apply knowledge of Living anatomy with respect to Cardio Vascular &Respiratory system.
- Able to acquire anatomical basis of clinical conditions of cardiovascular & Respiratorysystem

**Psychomotor:**

- Describe the Anatomical aspects of muscles, bones, joints, their attachments & and analyze the movements
- Describe various parts of nervous system and describe the blood circulation to brain &spinal cord
- Describe the course of peripheral nerves, its supply and action to each muscle.

- Describe various structures of the Cardio Vascular &Respiratory system and the course of blood vessels
- Describe various structures of Thoracic cage and mechanisms of Respiration

**COURSE OUTCOMES:**

- To understand the basics terminology and various anatomical structures of the body.
- To understand the bones, joints, muscles, vascular and nerve supply of upper limb.
- To understand the various parts of brain and spinal cord with its pathways andvascularity of brain.
- To understand the bones, joints, muscles, vascular and nerve supply of head and neck.
- To understand the routes and functions Cranial Nerves.
- To understand the various parts and surfaces of Heart, Lungs and Viscera.
- To understand the bones, joints, muscles, vascular and nerve supply of lower limb.
- To understand the various parts of bones and joints of thorax, intercostal muscles, movements of thorax.
- To understand the various parts and surfaces of stomach, GIT, pancreas and liver.
- To understand various anatomical parts of reproductive system.

| SR.NO | REGIONS | THEORY HOURS | PRACTICAL HOURS |
|---|---|---|---|
| 1 | **GENERAL ANATOMY, HISTOLOGY AND EMBRYOLOGY** | 19 | 3 |
| a | **General Anatomy:** | 6 | |
| | i. Fascia<br>ii. Muscles<br>iii. Bones<br>iv. Joints<br>v. Nerve<br>vi. Vessels | | |
| b | **General Histology** | 7 | 3 |
| | i. Epithelial<br>ii. Connective tissue<br>iii. Muscle<br>iv. Bone and cartilage<br>v. Nerve and vessels | | |
| c | **Embryology** | 6 | |

| | | | |
|---|---|---|---|
| | i. Formation of Germ layers &Neural Tube<br>ii. Formation of Bones, Muscles &Nervous Tissue<br>iii. Formation of Limbs<br>iv. Formation of Brain & Spinal cord<br>v. Formation of Heart & Lungs | | |
| 2 | **MUSCULOSKELETAL SYSTEM** | 64 | 34 |
| a | Upper extremity | 15 | 10 |
| b | Lower extremity | 15 | 10 |
| c | Back & Thoracic Cage | 10 | 5 |
| | Back Muscles<br>Ribs & Sternum<br>Intercostal Muscles<br>Diaphragm & Mechanism of respiration | | |
| d | Abdomen and Pelvis | 7 | 2 |
| | Muscles of Abdomen<br>Muscles of Pelvic Floor and Cavity<br>Vertebral Column & vertebrae | | |
| e | **Head, Neck & Face** | 13 | 5 |
| | Skull and Mandible<br>Facial Muscle, blood supply, nerve supply<br>Triangles of neck, Glands, Tongue & Palate<br>Larynx & Pharynx<br>Muscles of mastication & T.M Joint<br>Extra ocular muscles with never supply<br>Nose & Para nasal sinuses | | |
| f | **Living Anatomy:** | 4 | 2 |
| | i. Upper extremity<br>ii. Lower extremity<br>iii. Head , Neck & Face<br>iv. Trunk | | |
| 3 | **NEUROANATOMY** | 32 | 12 |
| a | General organization of Nervous System | 5 | |
| b | Central Nervous System | 15 | 8 |
| c | Cranial nerves | 10 | 4 |
| d | Peripheral Nerves (should be done with | 2 | |

| | | | |
|---|---|---|---|
| | Respective parts) | | |
| | i. Autonomic Nervous System:<br>ii. Sympathetic<br>iii. Parasympathetic | | |
| 4 | **SYSTEMIC ANATOMY** | 17 | 11 |
| A | **Abdominal & Pelvic Organs** | 4 | 2 |
| a | Alimentary system | | |
| b | Urinary System | | |
| c | Genital system | | 2 |
| | i. Male organs<br>ii. Female organs | | |
| B | **CARDIOVASCULAR & RESPIRATORY ANATOMY** | 9 | 3 |
| a | Thoracic wall | | |
| b | Mediastinum | | |
| c | Heart and major blood vessels | | 2 |
| d | Lungs | | 1 |
| 5 | **SENSORY ORGANS** | 4 | 2 |
| a | Ear | | |
| b | Eye | | |
| c | Skin | | |
| 6 | **ENDOCRINE & EXOCRINE SYSTEM** | 4 | |
| 7 | **RADIOLOGY** | 10 | |

**RECOMMEMDED TEXTBOOKS**


1. B. D. Chaurasia, Volume- I, II , III & IV ; Human Anatomy; CBS Publishers and Distributers

2.Inderbir Singh; Neuroanatomy; Jaypee Brothers Medical Publishers

3.Kadasne, Human Anatomy; Volume- I, II & III; Jaypee Brothers Medical Publishers

4.B D Chaurasia; General Anatomy; CBS Publishers and Distributers

5.Sampath Madhyastha : Manipal Manul of Anatomy , CBS Publishers.


**RECOMMEMDED REFERENCE BOOKS**

1. Richard Drake, A. Wayne Vogl, Adam Mitchell; Gray's Anatomy; Elsevier
2. Quining Wasb; Extremities; Lippincott Williams and Wilkins
3. Mariano De Fiore; Atlas of Histology; Lea & Febiger
4. Smoutand McDowell; Anatomy & Physiology; Edward Arnold
5. Katherine Wells; Kinesiology; Saunders (W.B.) Co Ltd
6. Splittgerber; Snell's Neuroanatomy; Wolters Kluwer
7. Textbook of Clinical Neuroanatomy; Vishrsam Singh; Elsevier India
8. G. J. Romanes;Cunnigham's- Practical Anatomy; Volume I II and III; Oxford University Press


**INTERNAL ASSESSMENT:**

1. Two exams –Terminal and prelims of 80 marks each (Theory & Practical) TOTAL-160 marks
2. I.A. to be calculated out of 20 marks (Theory & Practical)
3. Internal assessment as per University pattern.

## SCHEME OF UNIVERSITY EXAMINATION

| **HUMAN ANATOMY THEORY**<br>**80 MARKS + I.A. – 20 MARKS**<br>* The question paper will give appropriate weightage to all the topics in the syllabus. | | **Marks**<br><br>**100** |
|---|---|---|
| **Section A** | **Q-1 - Answer any TWO out of THREE (2 x 10 Marks = 20)**<br>**(**should be based on Musculoskeletal anatomy)<br>**Q-2 - Answer any FOUR out of FIVE (4 x 5 Marks = 20)**<br>Should be based on: Digestive/ Uro-genital /Reproductive system / Special senses- Eye / Ear / Skin / Circulatory system / General Anatomy/General Histology | **40** |
| **Section B** | **Q-3 - Answer any TWO out of THREE (2 x 10 Marks = 20)**<br>(Should be based on Neuro -Anatomy –including cranial nerves with emphasis to III to XII nerves)<br>**Q-4 - Answer any FOUR out of FIVE (4 x 5 Marks = 20)**<br>Should be based on: Thorax / Soft parts Upper Limb / Soft part Lower Limb/ Thorax/Spine/Neck/ Abdominal /Pelvic Muscle | **40** |
| **Total Marks** | | **80** |

| ANATOMY PRACTICAL<br>80 MARKS+ I.A.– 20 MARKS | | Marks<br>100 |
|---|---|---|
| **Spots** | Based on:<br>i. Musculoskeletal (7x3) = 21 marks<br>ii. Systemic (5x3) = 15 mark<br>iii. Neuro anatomy (3x3) = 09 marks | **45** |
| **Radiology** | | **05** |
| **Living anatomy** | | **05** |
| **Viva** | iv. Hard parts<br>v. Soft parts | **20** |
| **Journal** | Year work on practicals performed | **05** |
| **Total Marks** | | **80** |

# HUMAN PHYSIOLOGY-P103

**Theory-150hrs + Practical /Laboratory-50hrs= Total 200hrs**

**(UNIVERSITY EXAMINATION)**

## COURSE DESCRIPTION:

The course is designed to study the function of the human body at the molecular, cellular, tissue and systems levels. The major underlying themes are; the mechanisms for promoting homeostasis, cellular processes of the metabolism, membrane function and cellular signaling; the mechanisms that match supply of nutrients to tissue demands at different activity levels; the mechanisms that match the rate of excretion of waste products to their rate of production; the mechanisms that defend the body against injury and promote healing.

These topics address the consideration of nervous and endocrine regulation of the cardio vascular, hematopoietic, pulmonary, renal, gastro-intestinal and musculoskeletal systems including the control of cellular metabolism. The course stresses on the integrative nature of physiological responses in normal function and disease.

This course will serve as a pre-requisite/foundation for the further courses i.e. Exercise physiology or Pathology.

## COURSE OBJECTIVES:

At the end of the course, the candidate will:

**Cognitive:**

- Acquire the knowledge of the relative contribution of each organ system inmaintenance of the Milieu Interior (Homeostasis)
- Be able to understand physiological functions of various systems, with special reference to Musculo-skeletal, Neuro-motor, Cardio-respiratory, Endocrine, Uro-genital function, & alterations in function with aging
- Analyze physiological response & adaptation to environmental stresses-with special emphasis on physical activity, altitude, temperature
- Acquire the skill of basic clinical examination, with special emphasis to Peripheral &Central Nervous system, Cardiovascular & Respiratory system, & Exercise tolerance.

**Psychomotor**:

- Describe the basic function of Cell, its morphology and composition of Blood.
- Describe various physiology of Respiratory system, Muscular system, Cardio Vascular System , Nervous System, Digestive system, Autonomic Nervous System,

- Able to describe the basic physiology of exercises and its effects on various system.

**COURSE OUTCOMES:**

- To understand the basic function of Cell and its morphology.
- To understand the basic function and composition of Blood.
- To understand the basic physiology of Respiratory system.
- To understand the basic physiology of digestive system.
- To understand the basic physiology of Muscular system and its contraction mechanism

| SR.NO. | REGIONS | THEORY HOURS |
|---|---|---|
| A | **GENERAL PHYSIOLOGY** | |
| 1 | **Cell** | 8 |
| | Structure of cell membrane<br>Transport a cross cell membrane<br>R.M.P& action potential<br>Homeostasis | |
| 2 | **BLOOD** | 8 |
| | Composition and functions of blood(WBC, RBC, Platelets)<br>Blood group systems<br>Immunity<br>Hemostasis | |
| **3** | **NERVE -MUSCLE PHYSIOLOGY** | 14 |
| | **Nerve:** | 6 |
| | Structure, classification & Properties<br>i. EMG<br>ii. Propagation of nerve impulse<br>iii. Nerve injuries–degeneration, regeneration and reaction of degeneration | 1<br>1<br>1<br>1<br>2 |
| | **Muscle:** | 8 |
| | i. Structure properties classification-smooth, skeletal, cardiac, excitation/contraction coupling<br>ii. Factors affecting development of muscle tension, fatigue,load.<br>iii. Neuro -muscular transmission; applied physiology: Myasthenia gravis, Lambert Eaton Syndrome. | 3<br>3<br>2 |
| **4** | **NERVOUS SYSTEM** | 30 |

| | | |
|---|---|---|
| a. | Introduction of nervous system, classification – C.N.S., P.N.S. & A.N.S | 4 |
| b. | Synapse-structure, properties & transmission | 1 |
| c. | Reflexes-classification & properties | 3 |
| d. | Receptor physiology: classification, properties | 3 |
| e. | Physiology of Touch, Pain, Temperature & Proprioception | 2 |
| f. | Sensory and motor tracts: effect of transaction (complete and incomplete) at various levels | 4 |
| g. | Physiology of Muscle Tone (muscle spindle); Stretch reflex | 2 |
| h. | Connection & function of Basal ganglia, Thalamus , Hypothalamus ,Sensory and Motor cortex, Cerebellum, Limbic system ,Vestibular Apparatus | 8 |
| i. | Autonomic nervous system: Structure and functions of the sympathetic and the parasympathetic nervous system. | 1 |
| j. | Learning, memory & conditioned reflex | 1 |
| k. | Physiology of Voluntary movement | 1 |
| 5 | **EXCRETORY SYSTEM:** | **10** |
| a. | Kidneys- structure &function | 1 |
| b. | Urine formation; (to exclude concentration and dilution) | 2 |
| c. | Juxta glomerular apparatus | 1 |
| d. | Fluid and electrolyte balance–Na, K, H2O | 1 |
| e. | Neural control of Micturition | 1 |
| f. | Applied physiology: Types of bladder | 2 |
| g | Temperature Regulation | 2 |
| 6 | **ENDOCRINE SYSTEM:** | **10** |
| a. | Secretion-regulation & function of Pituitary, Thyroid, Adrenal, Parathyroid, Pancreas | 9 |
| b. | Applied physiology (abnormalities) of the above mentioned Glands | 1 |
| 7 | **REPRODUCTIVE SYSTEM:** | 8 |
| a. | Physiology of ovary and testis | |
| b. | Physiology of menstrual cycle and spermatogenesis | |
| c. | Functions of progesterone, estrogen and testosterone | |
| d. | Puberty & menopause | |
| e. | Physiological changes during pregnancy | |

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|---|---|---|
| 8 | **SPECIAL SENSES:** | 9 |
| a. | Structure and function of the eye | |
| b. | Applied physiology: errors of refraction, accommodation, reflexes– dark and light adaptation, photosensitivity. | |
| c. | Structure and function of the ear | |
| d. | Applied physiology –types of deafness | |
| 9 | **RESPIRATORY SYSTEM:** | 14 |
| a. | Introduction, structure and function of the RS | |
| b. | Mechanics of respiration | |
| c. | Pulmonary Volumes & capacities | |
| d. | Anatomical & Physiological Dead space- ventilation/ perfusion ratio, alveolar ventilation | |
| e. | Transport of respiratory gases | |
| f. | Nervous & Chemical control of respiration | |
| g. | Pulmonary function tests- Direct & indirect method of Measurement | |
| h. | Physiological changes with altitude & acclimatization | |
| 10 | **CARDIOVASCULAR SYSTEM:** | 19 |
| a. | Structure & properties of cardiac muscle | |
| b. | Cardiac impulse- initiation and conduction | |
| c. | Cardiac cycle | |
| d. | Heart rate | |
| e. | Cardiac output regulation& function affecting Peripheral Resistance, venous return. | |
| f. | Blood pressure, definition , regulation | |
| g. | Regional circulation-coronary-muscular, cerebral, pulmonary. | |
| h. | Normal ECG. | |
| 11 | **GASTRO INTESTINAL SYSTEM:** | 6 |
| a. | Absorption and digestion in brief | |
| b. | Liver function | |
| 12 | **EXERCISE PHYSIOLOGY** | 12 |
| a. | Basal Metabolic Rate and Respiratory Quotient | |
| b. | Energy metabolism | |
| c. | Fatigue | |

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|---|---|---|
| d. | Oxygen debt | |
| e. | Acute cardio vascular changes during exercise, difference between mild, moderate and severe exercise, concept of Endurance | |
| f. | Acute respiratory changes during exercise | |
| g. | Concept of training/conditioning, effects of chronic exercise / effect of training on the cardio vascular & respiratory system | |
| h. | Body temperature regulation during exercise | |
| i. | Hormonal and metabolic effects during exercise | |
| j. | Effects of exercise on muscle strength, power, endurance | |
| k. | Physical fitness and its components | |
| 13 | **PHYSIOLOGY OF AGEING (With respect to all systems)** | 2 |

| Sr.No | PRACTICALS | HRS |
|---|---|---|
| 1 | Haematology – (demonstration only) | 6 |
| 2 | GRAPHS: | 5 |
| | a. Skeletal muscle and its properties | |
| | b. Cardiac muscle-properties-effect of Ach & Adrenaline | |
| 3 | Examination of pulse | 2 |
| 4 | Blood pressure- effects of change in posture & exercise | 4 |
| 5 | ECG | 2 |
| 6 | Physical fitness: | 6 |
| | a. Breath holding | |
| | b. Mercury column test | |
| | c. Cardiac efficiency test- Harvard step test- Master step test | |
| 7 | Spirometry | 2 |
| | Lung volumes and capacities | |
| 8 | Perimetry | 1 |
| 9 | Clinical examination: History taking and general examination / Respiratory system / cardio vascular system / Higher functions / Cranial nerves /Reflexes / Motor & Sensory system | 20 |

| | | |
|---|---|---|
| 10 | Test of Deafness | 1 |
| 11 | I. Visual Acuity &<br>II. Visual Reflexes | 1 |

**RECOMMENDED TEXTBOOKS**

1. Chatterjee cc; Text book of Physiology; CBS Publishers and Distributers
2. Sujit Kumar Chaudhuri; Concise Medical Physiology; NCBA Publications

**RECOMMENDED REFERENCE BOOKS**

1. Ganong; Review of Medical Physiology; McGraw-Hill Education / Medical
2. Keele A. Cyril; Samson & Wright's Applied Physiology; OUP India
3. Bruce M. Koeppen ; Bern and Levy Textbook of Medical Physiology; Elsevier
4. Textbook on Medical Physiology–Guyton; Elsevier
5. K Sambulingam, Essentials of Medical Physiology, Jaypee Brothers, 7th Edition

**INTERNAL ASSESSMENT:**

1. Two exams–Terminal and prelims of 80 marks each (Theory & Practical)
   TOTAL –160 marks
2. I. A. to be calculated out of 20 marks (Theory & Practical)
3. Internal assessment as per University pattern

## SCHEME OF UNIVERSITY EXAMINATION

| | | Marks |
|---|---|---|
| **HUMAN PHYSIOLOGY THEORY**<br>**80 MARKS + I.A. – 20 MARKS**<br>* The question paper will give appropriate weightage to all the topics in the syllabus. | | **100** |
| **Section A** | **Q-1 - Answer any TWO out of THREE ( 2 x 10 Marks = 20)**<br>**(**should be based on Musculoskeletal and CVRS)<br>**Q-2 - Answer any FOUR out of FIVE (4 x 5 Marks = 20)**<br>Should be based on: Cardio-vascular system / Respiratory system / Exercise Physiology/Special Senses (Eye/Ear/Skin)/ Reproductive system/ GIT/ Excretory. | **40** |
| **Section B** | **Q-3 - Answer any TWO out of THREE ( 2 x 10 Marks = 20)**<br>(Should be based on CNS)<br>**Q-4 - Answer any FOUR out of FIVE (4 x 5 Marks = 20)**<br>Should be based on: Blood/ Electrolyte balance / Endocrine/ /General physiology/Nerve Muscle Physiology/ Exercise Physiology. | **40** |
| **Total Marks** | | **80** |

| | | Marks |
|---|---|---|
| **PHYSIOLOGY PRACTICAL**<br>**80 MARKS+I.A.– 20 MARKS** | | **100** |
| **Spots** | Based on: Topic 1,2,5,7,8,10,11 (10X2Marks) | **20** |
| **Viva** | Based on theory | **20** |
| **Demonstration** | On Clinical Physiology<br>C.V.S. 10Marks<br>R.S. 10Marks<br>C.N.S.<br>Cranial Nerves and Special Senses 15Marks | **35** |
| **Journal** | Year work on practicals performed | **05** |
| **Total Marks** | | **80** |

# BIOCHEMISTRY-P104

**Theory 50 hrs + Demonstrations 4 hrs =Total 54 hrs**

**(UNIVERSITY EXAMINATION)**

**COURSE DESCRIPTION:**

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 other nutrients i.e. carbohydrates, fats, enzymes, nucleic acids and amino acids.

**COURSE OBJECTIVES:**

**At the end of the course, the candidate will:**

**Cognitive:**

- Able to understand the biochemical change of the various elements of the body atcellular level and extra cellular level
- Able to understand various biomolecules which are present in the body and functions
- Acquire the knowledge of the formation and fate of these biomolecules
- Able to understand their normal levels in body fluids required for functioning and their abnormal levels to understand the disease process

**Psychomotor:**

- Describe biochemical change of the various elements of the body at cellular level andextra cellular level
- Describe various biomolecules which are present in the body and functions
- Describe their normal levels in body fluids required for functioning and their abnormal levels

**COURSE OUTCOMES:**

- To understand the metabolism, function and mechanism of action ofvarious elements of the body.
- To understand the transport system of electron and its effects on body
- To understand the metabolism, function and mechanism of action of various elements of the body like minerals, vitamins and nucleic acid.
- To understand the role of nutrition on body with biochemical changes.
- To understand the biochemical changes in connective tissues, muscles andnerves.
- To understand the biochemical markers for diagnosis of various diseases and conditions.

| SR .NO. | REGIONS | THEORY HOURS |
|---|---|---|
| 1 | **CARBOHYDRATES** | 9 |
| a | Chemistry, Definition, Classification with Examples, Functions | |
| b. | Digestion and Absorption, Glycogenesis, Gluconeogenesis, Glycogenolysis and HMP pathway, Glycolysis, Electron transport chain for ATP synthesis, TCA cycle. Hormonal regulation of blood | |
| c. | Glucose, Glycogen storage disorders, Diabetes mellitus,Glycosuria, changes in Carbohydrate, Protein & Lipid metabolism. | |
| d. | All the metabolisms should be taught based on the followingpoints such as starting and ending products, tissues of occurrence and the conditions when the pathway is activated,deactivated and significance of the pathway. | |
| 2 | **PROTEINS** | 6 |
| a. | Definition, Importance, Functional Classification, Digestion & Absorption, decarboxylation, deamination, transamination, transmethylation, Urea cycle, clinical significance of serum urea, function of glycine, Phenylalanine, trytophan, methioninetyrosine. | |
| b. | There should be an emphasis on understanding the structure ofprotein, the essential and non- essential amino acids. | |
| 3 | **ENZYMES** | 4 |
| | Definition, Modern Classification, Factors affecting enzymes Action, diagnostic & therapeutics uses & enzymes, Isoenzymes, | |
| | Competitive & Non Competitive Inhibition. | |
| 4 | **VITAMINS** | 4 |
| | Definition, Classification, Fat & water soluble vitamins, functions, Deficiency manifestations, sources & RDA (Vit. C,B12, Folic acid, Thiamin) | |
| | Rest all vitamins | |
| 5 | **MINERALS** | 5 |
| | Ca, P, Fe, I, Zinc, Selenium, Fluorine, Magnesium include Na and K. Function sources, Deficiency manifestations | |

| | | |
|---|---|---|
| 6 | **HORMONES** | 5 |
| | Definition with mechanism of action, classification.<br>Thyroid Hormone- Synthesis, Biochemical functions ,Assessment of abnormality with thyroid function test | |
| 7 | **NUTRITION** | 3 |
| | Composition of food ,balanced diet, Kwashiorkor, 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) | |
| 8 | **CLINICAL BIOCHEMISTRY** | 6+4(demo) |
| a. | Liver Function Test, Renal Function Test, Lipid profile in serum | |
| b. | Starvation metabolism, Haemoglobin chemistry and metabolism | |
| c. | Demonstrations: Demonstration of estimation of various biomolecules and their interpretation Interpret reports of various conditions (including Diabetic profile, Cardiac profile, Uric acidand Gout) | |
| 9 | **LIPID** | 4 |
| | Definition, classification with examples biomedical importance, Phospholipids & lipoproteins functions. Digestion & absorptionof lipid, β oxidation of fatty acid with Energetics, Ketone bodies and their metabolism, Prostaglandins and essential fatty acids , Cholesterol, importance of Cholesterol, obesity | |
| 10 | **MUSCLE CONTRACTION** | 4 |
| | Mechanism & Biochemical events Connective Tissue- Biochemistry of connective tissue Collagen Glycoprotein proteoglycans | |

**RECOMMENDED TEXTBOOKS**


1. U Satyanarayana; Biochemistry; Elsevier India
2. Vasudevan DM; Textbook of Biochemistry for Medical students; Jaypee BrothersMedical Publishers
3. Naik Pankaja; Essentials Of Biochemistry; Jaypee Brothers Medical Publishers

**RECOMMENDED REFERENCE BOOK**

1. Robert K. Murray; Harpers Biochemistry (24th ed); Appleton & Lange

**INTERNAL ASSESEMENT**

1. Two exams –Terminal and prelims of 40 marks each TOTAL - 80marks
2. I.A.to be calculated out of 10 marks (Theory only)
3. Internal assessment as per University pattern.

**SCHEME OF UNIVERSITY EXAMINATION**

| **BIOCHEMISTRY THEORY**<br>**40 MARKS + I.A. – 10 MARKS**<br>* The question paper will give appropriate weightage to all the topics in the syllabus. [There shall be no LAQ in this paper] | | **Marks**<br>**50** |
|---|---|---|
| **Section A** | **Q-1 - Answer any FOUR out of FIVE**<br>**(4 x 5 Marks = 20)** | **20** |
| **Section B** | **Q-2 - Answer any FOUR out of FIVE**<br>**(4 x 5 Marks = 20)** | **20** |
| **Total Marks** | | **40** |

## FUNDAMENTALS OF KINESIOLOGY & KINESIOTHERAPY- P105

**Didactic 100 Hrs +Practical / Laboratory 150 Hrs = Total 250 Hrs**

**(UNIVERSITY EXAMINATION)**

**COURSE DESCRIPTION:**

This course covers the definition of various terms used in mechanics, biomechanics kinesiology as well as its importance in physical therapy. It applies the mechanical principles to simple equipment's of therapeutic gymnasium and familiarizes the candidate to its use. It covers the types of human motions as well as planes and relative axes of motion. It also explains the inter-relationship among kinematic variables and utilizes this knowledge to describe and analyze motion. It covers the classification of the joints and muscles along their distinguishing characteristics and skill of measurement of its ranges in various planes and axes. This course additionally covers therapeutic principles and skills of application of massage, yoga, aerobic exercise and use of suspension therapy. It also enhances the skill of evaluation of vital parameters & sensory system.

**COURSE OBJECTIVE:**

**Cognitive:**

At the end of the course, the candidate will be able to:

- Define the various terms used in relation to Mechanics, Biomechanics & Kinesiology
- Recall the basic principles of Biophysics related to mechanics of movement / motion & understand the application of these principles to the simple equipment designs along with their efficacy in Therapeutic Gymnasium & various starting positions used in therapeutics.

**Psychomotor:**

At the end of the course, the candidate will be able to:

- Describe & also acquire the skills of use of various tools of the Therapeutic Gymnasium.
- Demonstrate the movements in terms of various anatomical planes and axes.
- Demonstrate various starting & derived positions used in therapeutics.
- Describe physiological principles & acquire the skills of application of therapeuticmassage.
- Acquire the skills of assessment of basic evaluation like sensations, reflexes & vital parameters.
- Acquire the skill of objective assessment of Range of Motion of the joints by Goniometry.
- Describe physiological basis and principle of relaxation and acquire the skills ofrelaxation

methods.

- Describe physiological responses and principles of aerobic exercises for generalfitness & demonstrate fitness skills on self & group.
- Describe physiological principles and acquire the skill of performing Pranayama & Yogasanas.

**Affective:**

- To maintain proper communication with the model/subjects for correct delivery of instruction during demonstration
- To follow the appropriate principle of the handling technique eg. Hand placement, stabilization, fixation etc.
- To perform safe, respectful and effective handling during demonstration.

**COURSE OUTCOMES**

- To understand terminologies of Mechanics and Biomechanics
- To understand movements in various plane.
- To understand method of assessment of sensation and reflexes and vital parameters and develop skill in assessment.
- To understand various starting and derived position in therapeutic exercises and its effect and uses.
- To understand and acquire skills in yogasanas and fitness training.
- To understand basic principles in performing any assessment and therapeutic handling techniques.

| SR.NO | TOPICS | THEORY HOURS | PRACTICAL HOURS |
|---|---|---|---|
| 1 | **MECHANICS & BASIC BIOMECHANICS** | **25** | |
| | **a. Mechanics & Application to human body**<br>i. Explain in Detail: Mechanics (Statics & Dynamics), Biomechanics, Kinetics ,Kinematics (Osteo kinematics, Arthrokinematics, Open Chain & Closed Chain kinematics)<br>ii. Axes /planes<br>iii. Laws of inertia & motion<br>iv.Gravity, C.O.G, L.O.G. and B.O.S.<br>v. Equilibrium–Types and affecting factors<br>vi.Mechanics of Forces Work, Energy, Speed, Power, Friction, Momentum, Parallelogram of | 20 | |

| | | | |
|---|---|---|---|
| | Forces<br>vii.Torque<br>viii. Pendulum<br>ix. Mechanical and Anatomical pulleys<br>x. Levers<br>xi. Fluid mechanics related to Hydrotherapy (physics, statics & dynamics) | | |
| | **b.Muscle Mechanics**<br>i. Types of Muscles-Anatomical & Physiological<br>ii. Types of muscle work / Contraction<br>iii. Muscle Action: Roles as Agonist, Antagonist, Fixators, Synergist<br>iv. Active & Passive insufficiency<br>vi. Range of muscle work, Angle of pull – with importance to efficiency of muscle work and stability of joint | 5 | |
| 2 | **BIO-PHYSICS RELATED TO KINESIOTHERAPY** | 20 | 37 |
| | **a. Starting Positions & Derived Positions**<br>i. Application of stability<br>ii. BOS, Gravity and muscle work in relation to various positions<br>iii. Application of Position & uses | 10 | 5 |
| | **b. Therapeutic Gymnasium**<br>i) Stability training equipment:<br>Swiss Ball, Wobble Board, Bosu ball<br>ii) Mobility training equipment:<br>Walking aids, pulleys, shoulder wheel, finger ladder, ankle mobilize, knee ratchets, foam roller,roller skates<br>iii) Strength training equipment:<br>Weights, resistance bands and wands, medicine ball, springs, ankle mobilize, dumbells<br>iv) Effects, uses and Applied mechanics of all above | 5 | 17 |

| | | | |
|---|---|---|---|
| | accessories | | |
| | **c. Suspension Therapy**<br>i.Principles<br>ii.Suspension Apparatus<br>iii.Types of Suspension<br>iv.Effects and uses<br>v.Techniques for individual joints | 5 | 15 |
| **3** | **CLASSIFICATION OF MOVEMENTS** | **10** | **15** |
| | i.Definition and classification<br>ii.Principles of movements<br>iii.Effects, uses and Techniques (active assisted, Free assisted- resisted, resisted & passive) | | |
| **4** | **BASIC EVALUATION** | **15** | **35** |
| | **a. Assessment of Vital Parameters**<br>i. Temperature<br>ii. Blood Pressure<br>iii. Heart Rate/ Pulse rate<br>iv. Respiratory Rate<br>v.Chest expansion | 5 | 5 |
| | **b. Assessment of Sensations and Reflex testing** | 5 | 5 |
| | **c. Goniometry**<br>i.Definition and Types of Goniometers<br>ii.Principles<br>iii. Techniques for individual joints with biomechanical principles<br>iv.Uses | 5 | 25 |
| 5 | **MASSAGE** | 5 | 8 |

| | | | |
|---|---|---|---|
| | a.Definition<br>b.Classification<br>c.Principles<br>d.Effects & uses<br>e.Indications and contra indications<br>f.Techniques- Upper limb, Lower Limb, Neck,Back, Abdomen, Face & Scalp | | |
| 6 | **RELAXATION** | **5** | **10** |
| | a.Principles,<br>b.Techniques along with their effects & uses<br>i.General-Jacobson's, Shavasana & Reciprocal (Laura Mitchell)<br>ii Local -Heat, Massage ,Gentle / Rhythmic passive movements | | |
| 7 | **AEROBIC CONDITIONING AND BASIC PRINCIPLES OF GENERALFITNESS**<br>(as applied to self and group) | 5 | 5 |
| | a. Physiology of aerobic and anaerobic exercise.<br>b. Components of fitness (definition of termsonly)<br>c. Warm up & Cool down exercises and itseffects.<br>e. Group & Recreational activities | | |
| 8 | **YOGA** | 15 | 40 |
| | a.Definition<br>b.Principles of Yoga<br>c.Yogasana- Technique, Benefits, Indications, Contraindications & cautions for each Asanas: | 3 | |
| | **i**. Asanas in supine<br>a. Pawanamuktasana<br>b.Ardha Halasana<br>c.Halasana<br>d.Setubandhasana<br>e.Naukasana | 3 | |

| | | | |
|---|---|---|---|
| | f. Matsyasana<br>g. Shavasana<br>h. Sarvangasana | | |
| | **ii.** Asanas in prone<br>a. Bhujangasana<br>b. Ardha-Shalabhasana<br>c.Dhanurasana<br>d. Makarasana | 3 | |
| | **iii.** Asanas in sitting<br>a. Padmasana, Siddhasana, Sukhasana<br>b. Yogamudrasana<br>c. Virasana<br>d. Vajrasana<br>e. Gomukhasana<br>f. Pashchimottanasana | 3 | |
| | **iv.** Asanas in standing<br>a. Padhastasana, Padangusthasana, Uttanasana<br>b. Utkatasana<br>c. Tadasana<br>d. Trikonasana<br>**v**. Pranayama<br>i. Anulom-vilom<br>ii. Kapalbhati | 3 | |

**RECOMMENDED TEXTBOOKS**


1. M. Dena Gardiner; Principles of Exercise Therapy; CBS Publishers and Distributers
2. M. Hollis; Massage for Therapists: A Guide to Soft Tissue therapy; Wiley-Blackwell
3. Margaret Hollis, Phyllis Fletcher Cook; Practical Exercise therapy; Wiley
4. Hydrotherapy– Kisner ,Hollis
5. Cynthia C Norkin, D Joyce White;. Measurement of Joint Motion: A Guide to Goniometry; Jaypee Brothers Medical Publishers
6. Cynthia C. Norkin, Pamela Levangie; Joint Structure and Function; F.A. DavisCompany
7. S. Datta Ray; Yogic Exercises-Physiologic and Psychic processes; Jaypee Brothers

Medical Publishers

8. Lynn Allen Colby Carolyn Kisner John Borstad; Therapeutic Exercise:Foundations and Techniques; F A Davis C

**RECOMMENDED REFERENCE BOOKS**

1. Sidney Licht; Massage, Manipulation &Traction; Krieger Pub Co
2. Sydney Litch; Therapeutic Exercise; Weaverly Press
3. Omprakash Tiwari; Asanas Why & How; Zen Publications
4. Peggy a Houghlum' Dolores B. Beroti; Brunnstrom'S Clinical Kinesiology

**INTERNAL ASSESSMENT:**

Two exams–Terminal and preliminary examination (Theory &Practical)
of 80 marks each TOTAL – 160 marks

1. Internal Assessment to be calculated out of 20marks.
2. Internal Assessment as per University pattern.
3.

**SCHEME OF UNIVERSITY EXAMINATION**

| **FUNDAMENTAL OF KINESIOLOGY & KINESIOTHERAPY THEORY -**<br><br>**80 MARKS + I.A. – 20 MARKS**<br><br>* The question paper will give appropriate weightage to all the topics in the syllabus. | | **Marks**<br><br>**100** |
|---|---|---|
| **Section A** | Q-1- Answer any TWO out of THREE **[2 x 10 M = 20]**<br>**(** Basic, Mechanics & Biomechanics, Starting & Derived position, Suspension)<br>Q-2 - Answer any FOUR out of FIVE **[4 x 5 M = 20]**<br>(All topics) | **40** |
| **Section B** | Q-3 - Answer any FOUR out of FIVE **[4 x 5 = 20]**<br>(Movements , Relaxation, Goniometric, Yoga)<br>Q-4- Answer any TWO out of THREE **[2 x 10 = 20]**<br>( All topics) | **40** |
| **Total Marks** | | **80** |

| **FUNDAMENTAL OF KINESIOLOGY & KINESIOTHERAPY**<br>**PRACTICAL**<br>80 MARKS+ I.A.– 20 MARKS | | **Marks**<br>**100** |
|---|---|---|
| **LONG CASE** | Based on Suspension Therapy/Goniometry/Movements ( passive)<br>Cognitive – Biophysics, Biomechanical principles, indications, contraindication, documentation of findings etc -20 Marks<br>Psychomotor + Affective skills -10 Marks | **30** |
| **SHORT CASE** | Two Short case based on: (2x20=40marks)<br>Basic evaluation<br>(**any one**):Sensation / Reflex testing / B.P./ & Pulse Rate/ Chest Expansion /.Respiratory Rate/Aerobic fitness for self-Skill performance<br>(**any one**):Relaxation / Yogaposture / Starting / Derived position & Massage<br>Cognitive – 05Marks<br>Psychomotor - 15Marks | **40** |
| **COMMUNICATION SKILL** | | **5** |
| **JOURNAL** | Year work on practicals performed. | **5** |
| **Total Marks** | | **80** |

# FUNDAMENTALS OF ELECTROTHERAPY- P106

**Didactic 95 hrs+ Practical 105 hrs =Total-200hrs**

**(UNIVERSITY EXAMINATION)**

## COURSE DESCRIPTION:

This course will cover the basic principles of Physics that are applicable in medical equipment's used in Physiotherapy. It will also help to understand the fundamentals of currents, sound waves, Heat & its effects, electro medical radiations and their effects as well as their application in physical therapy. It covers the skill of application of superficial thermal agents and Cryotherapy.

## COURSE OBJECTIVES:

### Cognitive:

At the end of the course, the candidate will be able to:

- Recall the physics principles & Laws of Electricity, Electromagnetic spectrum, & Ultrasound
- Describe effects of environmental & manmade electromagnetic field at the cellular level & risk factors on prolonged exposure.
- Describe the Main electrical supply, Electric shock, precautions
- Enumerate Types & Production of various Therapeutic electrical currents & describethe panel diagrams of the machines

### Psychomotor:

At the end of the course the candidate will be able to–

- Test the working of electro therapeutic equipment.
- Describe in brief, certain common electrical components such as Transistors, Valves, Capacitors, Transformers etc & the simple instruments used to test /calibrate these components [such as Potentiometer, Oscilloscope, Multi Meter] of the circuit; & willbe able to identify such components.
- Describe & identify various types of electrodes used in therapeutics, describe electrical skin resistance & significance of various media used to reduce skin resistance.
- Acquire knowledge of various superficial thermal agents such as Paraffin wax bath, Cryotherapy, Hydro collator packs, Home remedies, their physiological & therapeutic effects, merits/demerits & acquire the skill of application.

### Affective:

- To maintain proper communication with the model/ subjects for correct delivery of instruction during demonstration
- To follow the appropriate testing of electro therapeutic equipment.
- To perform safe, respectful and effective handling during demonstration.

**Course Outcomes:**

- To understand basic knowledge about medical electronics and electricity including basic physics, condenser, mains supply, shock, electrical skin resistance, static and current electricity, faradic and galvanic current.
- To understand about fundamentals of high frequency currents including electromagnetic induction, magnetism, sound, AC/DC currents, Electromagnetic Spectrum, Cellular Biophysics, and environmental currents.
- To understand the production, physical principles, panel diagrams, and testing of deep heating modalities, of low frequency current modalities & actinotherapy modalities
- To understand Construction/ Design of the Modalities, Scales of temperature, Specific heat & modes of energy transfer, Physiological effects, Therapeutic effects/ Uses, Merits/ demerits, Indications/contra-indications, Skills of application of superficial thermal agents.

| SR. NO. | TOPIC | THEORY HOURS | PRACTICAL HOURS |
|---|---|---|---|
| **1** | **MEDICAL ELECTRONICS AND ELECTRICITY** | **55** | **15** |
| **A.** | **Fundamentals of Low frequency currents** | **32** | **9** |
| **i.** | **Basic Physics:** | **3** | |
| | Structure of atom, Isotopes, States of matter; Compound formation-(covalent formation), Properties of Electric lines of forces, Conductors, Non-conductors, Latent heat, Transmission of heat | | |
| **ii.** | **Condenser** | **3** | |
| a) | Principles | | |
| b) | Capacity | | |
| c) | Types &construction | | |
| d) | Electric field | | |
| e) | Charging and discharging of the condenser | | |
| f) | Duration of Discharge | | |
| g) | Discharge through inductance | | |
| h) | Capacitive reactance & uses of condenser | | |
| **iii.** | **Main supply:** | **3** | **3** |

| | | | |
|---|---|---|---|
| a) | Production of Electricity | | |
| b) | Types: A.C. / D.C | | |
| c) | Distribution/Grid system wiring of the house, colour coding of electrical supply to the apparatus | | |
| d) | Earthing and its importance | | |
| e) | Types of Plugs & Switches | | |
| **iv.** | **Shock** | **2** | |
| a) | Definition | | |
| b) | Types (Electric Shock & Earth shock) | | |
| c) | Severity Causes, Effects & Precaution | | |
| **v.** | **Static Electricity:** | **3** | |
| a) | Theory of Electricity | | |
| b) | Production of Electric Charge | | |
| c) | Characteristics of charged electrical body and capacitor and inductance: types &uses | | |
| d) | Potential difference | | |
| **vi.** | **Current electricity** | **6** | **6** |
| a) | EMF | | |
| b) | Resistance: Combination of resistance in series and parallel | | |
| c) | Ohms Law | | |
| d) | D.C., A.C. | | |
| e) | Devices for regulating current: Identification, functioning & Uses- Rheostat Potentiometer, Ammeters, Oscilloscopes, Voltmeter | | |
| f) | Voltage and Power | | |
| g) | Thermal effects of electric current- Joule's Law. | | |
| **vii.** | **Electrical Skin Resistance**: | **2** | |
| a) | Skin Resistance | | |
| b) | Factors affecting Skin resistance: types of electrodes used, electrode gels, skin threshold, skin type, skin temperature, exercises | | |
| c) | Methods to reduce skin resistance | | |

| | | | |
|---|---|---|---|
| **viii.** | **Faradic currents:** Duration, frequency, wave forms & graphical representation, surging, faradic type current, pulse width modulation, | **5** | |
| **ix.** | **Galvanic currents/Direct current:** and interruptedgalvanic current, duration, frequency, waveforms & graphical representation | **5** | |
| **B.** | **Fundamentals of High frequency currents** | **13** | **6** |
| **i.** | **Electro Magnetic Induction:** | **3** | |
| a) | Production | | |
| b) | Direction of induced EMF | | |
| c) | Strength of induced EMF | | |
| d) | Type–Self & Mutual induction | | |
| e) | Inductive Reactance | | |
| f) | Eddy currents | | |
| g) | Principles and Laws–Faraday's, Lenz's | | |
| h) | Dynamo | | |
| **ii.** | **Apparatus for Modification of Currents:** | **2** | |
| a) | Interruption of current–Switch & Valve | | |
| b) | C-R timing circuit | | |
| c) | Multi vibrator Circuit, Pulse Generator | | |
| d) | Current supplied to patient – Impulse type | | |
| **iii.** | **Magnetism:** | **2** | |
| a) | Nature and Types | | |
| b) | Molecular theory of Magnetism | | |
| c) | Property of Magnet | | |
| d) | Magnetic effect of electric current– Electro Magnets | | |
| e) | Meters for measuring A.C. | | |
| **iv.** | **Sound:** | **2** | |
| a) | Wave motion in sound | | |
| b) | Infrasonics | | |
| c) | Normal hearing band | | |
| d) | Characteristics of sound waves and their velocities | | |

| | | | |
|---|---|---|---|
| e) | Ultrasonics | | |
| f) | Reflection, Refraction and Attenuation of Sound waves | | |
| g) | Interference of sound waves | | |
| **v.** | **D.C. and A.C.:** | **4** | **6** |
| a) | Source–Cell and rectified AC | | |
| b) | Rectification of AC | | |
| c) | Thermionic valves– Diode and Triode | | |
| d) | Metal Rectifier | | |
| e) | Types of Rectification | | |
| f) | Transformers - Types & Functions | | |
| g) | Smoothing circuit | | |
| h) | Semiconductor and its types | | |
| i) | Diodes & Transistors | | |
| j) | Choke coil | | |
| **C.** | **Electro Magnetic Spectrum** | **5** | |
| i. | Laws of transmission, Reflection, Refraction, Absorption, Attenuation | | |
| ii. | Electro Magnetic Radiation | | |
| iii. | Laws Governing E.M.R. | | |
| iv. | Laws of Reflection, Refraction, Absorption, Attenuation, Cosine Law, Inverse Square Law, Grothus Law. | | |
| **D.** | **Cellular Bio-physics** | **3** | |
| i. | Action potential, | | |
| ii. | Resting membrane potential | | |
| iii. | Transmission of impulses: Saltatory conduction | | |
| iv. | Reception & emission of E.M.F. signals | | |
| **E.** | **Environmental currents** | **2** | |
| | Environmental currents & fields risk factors on Prolonged exposure to E.M. field. | | |
| **2** | **ELECTRICAL MODALITIES:** | **25** | **40** |
| | **Production, Physical principles, Panel diagrams,** | | |
| | **Testing of apparatus of the following:** | | |
| a. | S.W.D | | |
| b. | Ultrasound | | |

| | | | |
|---|---|---|---|
| c. | U.V.R. | | |
| d. | I.F.T. | | |
| e. | I.R. | | |
| f. | LASER (no panel diagram) | | |
| g. | Diagnostic Electrical muscle Stimulator | | |
| h. | T.E.N.S. | | |
| **3** | **SUPERFICIAL THERMAL AGENTS** | **15** | **50** |
| | Construction/ Design of the Modalities, Scales of temperature, Specific heat & modes of energy transfer, Physiological effects, Therapeutic effects/ Uses, Merits/ demerits, Indications/contra-indications, Skills of application: | | |
| a. | Home remedies | | |
| b. | Paraffin wax bath | | |
| c. | Whirl pool | | |
| d. | Contrast bath | | |
| e. | Hydro-collator hot packs | | |
| f. | Cryotherapy | | |

**RECOMMENDED TEXT BOOKS**


1. FORSTER A.; Claytons Electrotherapy Theory And Practice –3rd & 10thedition; CBS Publishers and Distributers
2. Val Robertson PhD, Alex Ward PhD, John Low et el; Electrotherapy explainedPrinciples and Practice; Butterworth-Heinemann
3. Joseph Kahn; Principles and Practice of Electrotherapy; Churchill Livingstone
4. Sheila Kitchen; Electrotherapy Evidence Based Practice 11th edition; ChurchillLivingstone

**RECOMMENDED REFERENCE BOOK**

1. Roger M. Nelson, Dean P. Currier, Karen W. Hayes; Clinical Electrotherapy; **PearsonINTERNAL**

**ASSESSMENT:**

Two exams –Terminal and preliminary examination (Theory & Practical) of 80 marks each. TOTAL – 160 marks

1. Internal Assessment to be calculated out of 20marks.
2. Internal Assessment as per University pattern.

| **FUNDAMENTALS OF ELECTROTHERAPY THEORY**<br><br>**80 MARKS + I.A. – 20 MARKS**<br><br>* The question paper will give appropriate weightage to all the topics in the syllabus. | | **Marks**<br><br>**100** |
|---|---|---|
| **Section A** | **Q-1 - Answer any TWO out of THREE**<br>Based on superficial Thermal agents<br>**(2 x 10 Marks = 20)**<br>**Q-2 - Answer any FOUR out of FIVE**<br>**( 4 x 5 Marks = 20)** | **40** |
| **Section B** | **Q-3 - Answer any TWO out of THREE**<br>(Based on Production /Panel Diagram of high frequency current / Actinotherapy) **OR**<br>(Based on Production / Panel Diagram of low/Medium frequency current) **(2 x 10 Marks = 20)**<br>**Q-4 - Answer any FOUR out of FIVE**<br>**(4 x 5 Marks = 20)** | **40** |
| **Total Marks** | | **80** |

**SCHEME OF**

## UNIVERSITY EXAMINATION

| UNDAMENTALS OF ELECTROTHERAPY<br>PRACTICAL<br>80 MARKS+ I.A.– 20 MARKS | | Marks<br>100 |
|---|---|---|
| **LONG CASE** | Based on Superficial thermal agent:<br>Cognitive – Medical Electronic, Physiological, Biophysical principles, Therapeutic effects, indications-contraindications -20Marks<br>Psychomotor + Affective skills - 10 Marks | **30** |
| **SHORT CASE** | Two Short case onTesting of equipment:<br>Low & Medium frequency<br>High frequency/ Actino-therapy (2 x 20=40marks)<br>• Cognitive – 05Marks<br>• Psychomotor - 15Marks | **40** |
| **COMMUNICATION SKILL** | | **5** |
| **JOURNAL** | Year work of practicals performed. | **5** |
| **Total Marks** | | **80** |

# SECOND YEAR BPTH SYLLABUS

**Transcript Hours-1400**

| SR.NO. | SUBJECT | TOPIC | DIDACTIC HOURS |
|---|---|---|---|
| 1 | **PROFESSIONAL PRACTICE & ETHICS P101** | i. Ethical code of conduct | 15 |
| | | ii. Communication Skill | |
| 2 | **PHARMACOLOGY P201** | i. General Pharmacology | 50 |
| | | ii. Drugs acting on C. N. S | |
| | | iii. Drugs acting on Autonomic Nervous System | |
| | | iv. Drugs acting on C.V.S | |
| | | v. Drugs acting on Respiratory System | |
| | | vi. Chemotherapy | |
| | | vii. Other Chemo therapeutic drugs | |
| | | viii. Endocrine | |
| | | ix. Drugs in G.I. Tract | |
| | | x. Haematinics | |
| | | xi. Dermatological drugs | |
| 3 | **PATHOLOGY & MICROBIOLOGY P202** | **PATHOLOGY** | 50 |
| | | i. General Pathology | |
| | | ii. Inflammation & Repair | |
| | | iii Immunopathology | |
| | | iv. Circulatory disturbances | |
| | | v. Pathologic changes in vitamin deficiencies | |
| | | vi. Growth disturbances | |
| | | vii. Specific pathology | |
| | | viii. Muscular disorders | |
| | | ix. Neuro-muscular junction | |
| | | x. Bone & joints | |
| | | xi. G. I. System | |
| | | xii. Endocrine | |

| | | | |
|---|---|---|---|
| | | xiii. Hepatic diseases | |
| | | xiv. Clinical Pathology | |
| | | **MICROBIOLOGY** | 35 |
| | | i. General microbiology | |
| | | ii .Laboratory diagnosis ofinfection | |
| | | iii. Immunology | |
| | | iv. Systemic bacteriology | |
| | | v. Mycology | |
| | | vi. Virology | |
| | | vii. Parasitology | |
| | | viii. Applied microbiology | |
| 4 | **PSYCHOLOGY P203** | i. Psychology: Nature & its fields | 30 |
| | | ii. Developmental Psychology | |
| | | iii. Theories of Learning | |
| | | iv. Memory | |
| | | v. Attention & Perception | |
| | | vi. Motivation and Theories | |
| | | vii. Conflict and Frustration | |
| | | viii. Anxiety Disorders | |
| | | ix. Affective Disorders | |
| | | x. Psychotic Disorders | |
| 5 | **KINESIOLOGY P204** | i. Muscle Biomechanics | |
| | | ii. Joint Biomechanics | |
| | | iii. Vertebral Column | |
| | | iv. Thorax and Chest wall Mechanics | |
| | | v. Shoulder Complex | |
| | | vi. Elbow Joint | |
| | | vii. Wrist and Hand Complex | |
| | | viii. Hip Joint | |
| | | ix. Knee Complex | |
| | | x. Ankle Foot complex | |
| | | xi. Temporo-Mandibular Joint | |

| | | | |
|---|---|---|---|
| | | xii. Kinetics and kinematics of various activities of daily living | 100 |
| | | xiii. Motor Control | |
| 6 | **KINESIOTHERAPY P205** | i. Biophysics | 245 |
| | | ii. Posture | |
| | | iii. Motor & Postural control andBalance | |
| | | iv. Functional Re-education | |
| | | v. Neuromuscular co-ordination | |
| | | vi. Gait | |
| | | vii. Walking Aids | |
| | | viii. Bronchial Hygiene | |
| | | ix. Posture | |
| 7 | **ELECTROTHERAPY P206** | i. Pain | 200 |
| | | ii. Low frequency Currents | |
| | | iii. Medium frequency Currents | |
| | | iv. High frequency Currents | |
| | | v. Biofeedback | |
| | | vi. Sound | |
| | | vii. Actinotherapy | |
| | | viii. Electrotherapy: wound care | |
| 8 | **COMPUTER APPLICATION P207** | i. Basics Of Computer | 40 |
| | | ii. Hardware and Software | |
| | | iii. Multimedia | |
| | | iv. Operating System | |
| | | v. Network | |
| | | vi. Microsoft | |
| | | vii. Power Point Presentation | |
| | | viii. Scientific Poster Designing | |
| | | i. Introduction To EVS | |
| | | ii. Natural Resources | |
| | | iii. Ecosystems | |
| | | iv. Biodiversity And Conservation | |

| | | | |
|---|---|---|---|
| 9 | **ENVIRONMENTAL SCIENCES P208** | v. Environmental Pollution<br>vi. Social Issues And Environment<br>vii. Human Population And Environment<br>viii. Field Work | 30 |
| 10 | **SEMINAR** | Seminar: On Biomechanics, Electrotherapy, Kinesiotherapy.Kinesiology | 105 |
| 11 | **SUPERVISED CLINICAL PRACTICE** | To practice clinical skills under the supervision, at the O.P.D./ I.P.D. set up. Clinical assignments should include Observation, Clinical History taking & technical assistance to the clinicians | 500 |

# PROFESSIONAL PRACTICE AND ETHICS- P101

**Total -15 HRS**

**(COLLEGE EXAMINATION IN FINAL YEAR)**

**COURSE DESCRIPTION**:

This subject would be taught in continuum from first year to final year. An exam in theory would be conducted only in final year. Professional and ethical practice curriculum content addresses the Knowledge, Skills and Behaviors required of the physiotherapist in a range of practice relationships and roles. The course will discuss the role, responsibility, ethics administration issues and accountability of the physical therapists. The course will also cover the history and change in the profession, responsibilities of the professional to the profession, the public and to the health care team. This includes the application of professional and ethical reasoning and decision-making strategies, professional communication.

**COURSE OBJECTIVES:**

**At the end of the course the candidate will be compliant infollowing domains:**

**Cognitive:**

- Be able to understand the moral values and meaning of ethics
- Will acquire bedside manners and communication skills in relationwith patients, peers, seniors and other professionals.

**Psychomotor:**

- Be able to develop psychomotor skills for physiotherapist-patientrelationship.
- Skill to evaluate and make decision for plan of management based onsocio- cultural values and referral practice.

**Affective:**

- Be able to develop behavioral skills and humanitarian approach while communicating with patients, relatives, society atlarge and co-professionals.
- Be able to develop bed side behavior, respect & maintain patient'sconfidentiality.

| SR. NO. | TOPIC | THEORY HOURS | SUPERVISION HOURS | TOTAL HOURS |
|---|---|---|---|---|
| 1 | Ethical code of conduct | 3 | 10 | 15 |
| 2 | Communication skills | | | |
| | a. Physiotherapist -Patient Relationship | 1 | | |
| | b. Interviewing -Types of interviews, Skills of interviewing | 1 | | |

# PHARMACOLOGY- P201

**Total Hours = 50 hrs**

**(UNIVERSITY EXAMINATION)**

**COURSE DESCRIPTION:**

This course covers the basic knowledge of Pharmacology including administration, physiologic response and adverse effects of drugs under normal and pathologic conditions. Topics focus on the influence of drugs in rehabilitation patient/client management. Drugs used in iontophoresis and phonophoresis will be discussed in detail.

**COURSE OBJECTIVES:**

At the end of the course, the candidate will be able to:

**Cognitive:**

- Describe pharmacological effects of commonly used drugs by patients referred for Physiotherapy; list their adverse reactions, precautions, contraindications, formulation & route of administration.
- Identify whether the pharmacological effect of the drug interferes with the Therapeutic response of Physiotherapy & vice versa
- Indicate the use of analgesics & anti-inflammatory agents with movement disorders with consideration of cost, efficiency, & safety for individual needs.

**Psychomotor:**

Get the awareness of other essential & commonly used drugs by patients - The bases for their use & common as well as serious adverse reactions.

**COURSE OUTCOME:**

- To understand the various routes of drugs administration, pharmacodynamics and pharmacokinetics of drugs.
- To understand the various drugs used for the treatment of ANS, PNS and CNS conditions with their mechanism of action and adverse effects.
- To understand the various drugs used for the treatment of endocrine system with their mechanism of action and adverse effects.
- To understand the various drugs used for the treatment of GIT problems with their mechanism of action and adverse effects.
- To understand the various antibiotic drugs with their mechanism ofaction and adverse effects.
- To understand the various drugs used for the treatment of ailment of cardio vascular system with

their mechanism of action and adverse effects.

- To understand the various drugs used for the treatment of Bronchial Asthma, Skin lesions and heavy metal poisoning.

| SR.NO | TOPICS | DIDACTIC HOURS |
|---|---|---|
| 1 | **GENERAL PHARMACOLOGY** | **4** |
| | i. Pharmacokinetics | |
| | ii. Routes of administration | |
| | iii. Adverse drug reaction and reporting | |
| | iv. Factors modifying drug effect | |
| 2 | **DRUGS ACTING ON C.N.S.** | **11** |
| | i. Introduction | 1 |
| | ii. Alcohols + Sedatives & Hypnotics | 2 |
| | iii. Anti - convulsant | 1 |
| | iv. Drug therapy in Parkinsonism | 2 |
| | v. Analgesics & antipyretics – especially Gout & R.A. | 3 |
| | vi. Psycho Therapeutics | 1 |
| | vii. Local anesthetics, counter irritants | 1 |
| 3 | **DRUGS ACTING ON AUTONOMIC NERVOUS SYSTEM** | **7** |
| | i. Adrenergic | |
| | ii. Cholinergic | |
| | iii. Skeletal muscle relaxants | |
| 4 | **DRUGS ACTING ON C.V.S.** | **7** |
| | i. Antihypertensives | 2 |
| | ii. Antianginal- Antiplatelets, Myocardial Infarction | 2 |
| | iii. C.C.F. | 1 |
| | iv. Shock | 1 |
| | v. Coagulants and Anticoagulants | 1 |
| 5 | **DRUGS ACTING ON RESPIRATORY SYSTEM** | **3** |

| | | |
|---|---|---|
| | i. Cough | |
| | ii. Bronchial Asthma | |
| | iii. C.O.P.D. | |
| 6 | **CHEMOTHERAPY** | **3** |
| | i. General principles | |
| | ii. Anti-Tuberculosis | |
| | iii. Anti –Leprosy | |
| 7 | **OTHER CHEMO THERAPEUTIC DRUGS** | **3** |
| | i. Drugs used in Urinary Tract Infection | |
| | ii. Tetra / chloral | |
| | iii.Penicillin | |
| | iv. Cephalosporin | |
| | v. Aminoglycosides | |
| | vi. Macrolides | |
| 8 | **ENDOCRINE** | **8** |
| | i. Insulin and oral Anti diabetic drugs | 2 |
| | ii. Steroids-Anabolic steroids | 2 |
| | iii .Drugs for osteoporosis, Vitamin D, Calcium, Phosphorus | 2 |
| | iv. Thyroid & Antithyroid | 1 |
| | v. Estrogen + Progesterone | 1 |
| 9 | **DRUGS IN G.I. TRACT** | **2** |
| | i. Peptic ulcer | |
| | ii. Diarrhea, Constipation & Antiemetics | |
| 10 | **HEAMATINICS** | **1** |
| | i. Vitamin B, Iron | |
| 11 | **DERMATOLOGICAL DRUGS** | **1** |
| | i. Scabies, Psoriasis, Local antifungal | |

**RECOMMENDED TEXT BOOKS**

1. Padmaja Udaykumar ,Pharmacology For Physiotherapy ;(Cbs)
2. H. L. Sharma, K. K. Sharma, Pharmacology For Physiotherapist; (Jaypee Brothers Medical)
3. K. D. Tripathi , Essentials Of Medical Pharmacology – (Jaypee Brothers Medical)

**RECOMMENDED REFERENCE TEXT BOOKS**

1. Pharmacology And Pharmacotherapeutics – Dr. R S Satoskar, Dr. Nirmala N. Rege, Dr. S. D. Bhandarkar (Elsevier India)

**INTERNAL ASSESSMENT**

1. Two exams – Terminal and preliminary examinationof 40 marks each
   TOTAL - 80 marks
2. Internal Assessment to be calculated out of 10 marks.
3. Internal assessment as per University pattern.

**SCHEME OF UNIVERSITY EXAMINATION (THEORY ONLY)**

| **THEORY- PHARMACOLOGY**<br><br>**40 marks + I.A. 10 Marks**<br>[There shall be no LAQ in this paper]<br><br>*Emphasis should be given to the drugs related to Musculo-skeletal /Neurological, Cardio-Vascular (excluding anti arrhythmic and shock) / Respiratory conditions, analgesics & anti-inflammatory conditions | | **Marks**<br><br>50 |
|---|---|---|
| **Section-A** | Q1 Answer any FOUR out of FIVE [4 x 5marks = 20 marks] | 20 |
| **Section-B** | Q2 Answer any FOUR out of FIVE [4 x 5marks = 20 marks] | 20 |
| **Total Marks** | | **40** |

# PATHOLOGY & MICROBIOLOGY- P202

**Theory 50 + 35 = Total 85Hrs**

**(UNIVERSITY EXAMINATION)**

## PATHOLOGY (Theory 50 Hrs)

**COURSE DESCRIPTION:**

Students will develop an understanding of pathology underlying clinical disease states involving the major organ systems and epidemiological issues. 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 referrals to another health care provider or alternative interventions are indicated. Students will develop the ability to disseminate pertinent information and findings, and ascertain the appropriate steps to follow.

The course more deals with structural impairments as an important part in ICFClassification.

**COURSE OBJECTIVES:**

At the end of the course, the candidate:

**Cognitive:**

- Will have sound knowledge of concepts of cell injury & changesproduced by different tissues, organs and capacity of the body inhealing process.
- Acquire the knowledge of general concepts of neoplasia with referenceto the Etiology, gross & microscopic features, & diagnosis, in differenttissues, & organs of the body.
- Acquire knowledge of common immunological disorders & theirresultant effects on the human body.

**Psychomotor:**

- Recall the etiology–pathogenesis, the pathological effects & the clinico–pathological correlation of common infections & non- infectious diseases.
- Understand in brief, about the common Hematological disorders& investigations necessary to diagnose them.
- Correlate normal & altered morphology of different organ systems indifferent diseases needed for understanding disease process & their clinical significance

**COURSE OUTCOME:**

At the end of the course, the student will be able to

- Acquire the knowledge of concepts of cell injury and changes produced thereby in different tissues and organs; Capacity of the body in healing Process.
- Recall the etio-pathological effects and the clinic-pathological correlation of common infection and noninfectious diseases.
- Acquire the knowledge of concepts of Neoplasia with reference to the Etiology, gross and microscopic features diagnosis and prognosis in different tissues and organs of the body.
- Correlate normal and altered morphology of different organ systems in different diseases needed for understanding disease process and their clinical significance (with special emphasis on Neuro-musculoskeletal and cardio-respiratory system).
- Acquire knowledge of common immunological disorders and their resultant effects on the human body.
- Understand in brief, about the Hematological diseases and theirresultant effects on the human body

| SR.NO. | TOPIC | THEORY HOURS |
|---|---|---|
| 1 | **GENERAL PATHOLOGY** | 4 |
| | a. Cell injury-Causes, Mechanism & Toxic injuries with special reference to Physical including ionizing radiation, Chemical & Biological | |
| | b. Reversible injury (degeneration)- types morphology -cloudy swelling, hyaline, fatty changes | |
| | c. Intra-cellular Accumulation- Mucin, Protein | |
| | d.Irreversible cell injury-types of necrosis, Apoptosis – Calcification-Dystrophic & Metastasis | |
| | e. Extra-cellular accumulation-Amyloidosis. | |
| 2 | **INFLAMMATION & REPAIR** | 6 |
| | a. Acute inflammation – features, causes, vascular & cellular events | |
| | b. Morphologic variations-Ulcers | |
| | c. Inflammatory cells & Mediators | |
| | d. Chronic inflammation: Causes, Types, Non- specific &Granulomatous | |

| | | |
|---|---|---|
| | – with examples | |
| | e. Wound healing by primary & secondary union, factors promoting & delaying healing process | |
| | f. Healing at various sites- bone, nerve & muscle | |
| | g. Regeneration & Repair | |
| **3** | **IMMUNO –PATHOLOGY** | **4** |
| | a. Immune system: organization-cells- antibodies regulation of immune responses | |
| | b. Hyper-sensitivity (types and examples including graft rejection) | |
| | c. Secondary Immuno-deficiency including H.I.V. | |
| | d. Basic concepts of autoimmune disease (emphasis on S.L.E. & R.A.) | |
| **4** | **CIRCULATORY DISTURBANCES** | **4** |
| | a. Oedema - pathogenesis - types - transudates / exudates | |
| | b. Chronic venous congestion- lung, liver | |
| | g. Thrombosis – formation – fate – effects | |
| | d. Embolism – types- clinical effects | |
| | e. Infarction – types – common sites | |
| | f. Gangrene – types etiopathogenesis | |
| | g. Shock – Pathogenesis, types | |
| **5** | **PATHOLOGIC CHANGES IN VITAMIN DEFICIENCIES** | **1** |
| **6** | **GROWTH DISTURBANCES** | **4** |
| | a. Atrophy, Hypertrophy, Hypoplasia, Metaplasia, Agenesis, Dysplasia | |
| | b Neoplasia classification, Histogenesis, Biologic behaviors, difference between Benign & Malignant tumour | |
| | c. Malignant neoplasms- grades-stages-local & distal spread | |
| | c. Carcinogenesis: Physical, Chemical, Occupational, Heredity, Viral, Nutritional | |
| | e. Precancerous lesions & Carcinoma in situ | |
| | g. Tumour & host interactions–local and systemic effects-metastatic | |

| | | |
|---|---|---|
| | (special reference to bones and C.N.S.) | |
| **7** | **MEDICAL GENETICS**<br>Classification with examples of genetic disorders | **01** |
| **8** | **SPECIFIC PATHOLOGY** | **10** |
| | **a. C.V.S.** | |
| | i.Atherosclerosis - Ischemic Heart Diseases – Myocardial Infarction– Pathogenesis /Pathology | |
| | ii.Hypertension | |
| | iii.C.C.F | |
| | iv.Rheumatic Heart Diseases | |
| | v.Peripheral Vascular Diseases | |
| | **b. Respiratory** | |
| | i.C.O.P.D | |
| | ii.Pneumonia (lobar, bronchial, viral), Lung Abscess | |
| | iii.T. B.: Primary, Secondary – morphologic types | |
| | iv.Pleuritis & its complications | |
| | v.Lung collapse – Atelectasis | |
| | vi.Occupational Lung diseases<br>(with special emphasis on Silicosis, Asbestosis, Anthracosis) | |
| | vii.A.R.D.S. | |
| | **c. Neuropathology:** | |
| | i.Reaction of nervous tissue to injury, infection & ischemia | |
| | ii.Meningitis: Pyogenic, T.B.M., Viral | |
| | iii.Cerebro-vascular diseases – Atherosclerosis – Thrombosis, Embolism, Aneurysm, Hypoxia Infarction & Hemorrhage, Hydrocephalous, Increased Intracranial Pressure, | |
| | iv.Leprosy | |
| | v.Parkinsonism | |
| **7** | **MUSCULAR DISORDERS** | |

| | | |
|---|---|---|
| | a. Classification of Muscular disorders with emphasis on Muscular Dystrophies | **3** |
| **8** | **NEURO-MUSCULAR JUNCTION** | **1** |
| | a. Myasthenia gravis | |
| | b. Myasthenic syndrome | |
| **9** | **BONE & JOINTS** | **5** |
| | a.Osteomyelitis – Rickets – Osteomalacia –Osteoporosis | |
| | b.Arthritis- degenerative (Osteoarthritis, Calcaneal spur, Periarthritis, Spondylosis) inflammatory (R.A., Ankylosing Spondylitis, Gout) | |
| | c.Miscellaneous- P.I.D., Haemarthosis | |
| | d.Infective-T.B. | |
| **10** | **ENDOCRINE** | **2** |
| | a.Hypo and Hyperthyroidism | |
| | b.Diabetes | |
| **11** | **HEPATIC DISEASES** | **1** |
| | a.Cirrhosis – emphasis to systemic effects of portal hypertension | |
| **12** | **G.I. SYSTEM** | **1** |
| | a.Gastric / Duodenal ulcer, Enteric fever, T.B., Enteritis, Gastritis(related to consumption of NSAID) | |
| **13** | **CLINICAL PATHOLOGY** | **3** |
| | a.Anemia – (deficiency) – T.C./D.C./ Eosinophilia Anaemia | |
| | b.Muscle / Skin / Nerve biopsy | |
| | c.Microscopic appearance of muscle necrosis – fatty infiltration | |
| | d. Histopathology | |

**RECOMMENDED TEXT BOOKS**

**RECOMMENDED TEXT BOOKS**

1. Harsh Mohan: Text Book Of Pathology ;( Jaypee Brothers Medical)
2. Bhende: General Pathology –(Popular Prakashan Ltd)

**RECOMMENDED REFERENCE BOOKS**

1. Cotran, Kumar; Robbins; Pathologic Basis Of Disease - (Elsevier India)

2.Robbins ; Basic Pathology;(Elsevier India)

## MICROBIOLOGY (35hrs)
## Theory 31 Hrs + Demonstration 4 Hrs

**COURSE DESCRIPTION:**

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.

**COURSE OBJECTIVE:**

- To identify common infectious agents and the disease.
- To evaluate methods used to identify infectious agents in the clinical microbiology lab.

**COURSE OUTCOME:**

At the end of the course, the candidate will

- Have sound knowledge of prevalent communicable diseases and the agents responsible for causing clinical infections pertaining to C.N.S, C.V.S, Musculoskeletal system, Respiratory system, Genitourinary system, wound infections and of newer emerging pathogens.
- Know the importance and practices of best methods to prevent the development of infections in self and patients (universal safety precautions).

| S.N. | TOPICS | THEORY HOURS | DEMONSTRATIONHOURS |
|---|---|---|---|
| 1 | **GENREAL MICROBIOLOGY** | **4** | **1** |
| | a. Introduction & scope | | |
| | b. Classification of Micro-organisms and Bacterial Anatomy (cell wall, capsule, spore, flagella and types as per their shape and arrangement) | | |
| | c. Sterilization | | |
| | d. Disinfection | | |

| | | | |
|---|---|---|---|
| | e. Demonstration for General Microbiology | | |
| **2** | **LABORATORY DIAGNOSIS OF INFECTION** | **2** | **1** |
| | a. Culture media and identification of bacteria | | |
| | b. Sample collection for smear examination and cultures | | |
| | c. Demonstration of Gram staining, ZN staining and culture media | | |
| **3** | **IMMUNOLOGY** | **5** | |
| | a. Innate immunity & acquired immunity | | |
| | b Structure and function of immune system and Immune response – normal / abnormal | | |
| | c. Define Antigen, Antibody and Antigen-antibody reaction & application for diagnosis | | |
| | d. Hyper-sensitivity | | |
| | e. Auto-immunity | | |
| **4** | **SYSTEMIC BACTERIOLOGY** | **7** | |
| | a. Infection caused by gram +ve cocci Staphylococcus, Streptococcus and Pneumococcus | | |
| | b. Infection caused by gram –ve cocci Gonococci and Meningococci | | |
| | c. Clostridium | | |
| | d. Enterobacteriaceae (E.Coli, | | |
| | Klebsiella) and Pseudomonas | | |
| | e. Salmonella and Vibrio | | |
| | f. Mycobacterial infection: | | |
| | i. Tuberculosis-Leprosy | | |
| | ii. Atypical Mycobacterium | | |
| | g Syphilis and Leptospirosis- Morphology & pathogenesis | | |
| **5** | **MYCOLOGY** | **2** | **1** |
| | a. Introduction and Superficial mycosis | | |
| | b. Mycetoma and opportunistic fungal infection | | |
| | c. Mycology and Virology demonstration | | |
| **6** | **VIROLOGY** | **5** | |

| | | | |
|---|---|---|---|
| | a .Introduction & general properties, | | |
| | b.DNA virus | | |
| | c.Measles, Mumps, Rubella, polio and congenitalviral infections | | |
| | d.Hepatitis and Rabies | | |
| | e.H.I.V. | | |
| **7** | **PARASITOLOGY** | **3** | **1** |
| | a.Introduction- Entamoeba histolytica | | |
| | b.Malaria, Filaria | | |
| | c.Toxoplasma – Cystisarcosis & Echinococcus | | |
| **8** | **APPLIED MICROBIOLOGY** | **3** | |
| | a.Hospital acquired infections, Universal safety precautions and Waste disposal | | |
| | b. Diseases involving Bones, Joints- Nerves-Muscles-Skin-Brain- Cardiopulmonary system, Burn and wound infections | | |

**RECOMMENDED TEXT BOOKS**

1. Ananthnarayan ; Concise Textbook Of Microbiology – (The Orient Blackswan)
2. C.P.Baweja ; Concise Textbook Of Microbiology - (Apc)
3. Nagoba ; Textbook Of Microbiology- (Wolters Kluwer India)

**RECOMMENDED REFERENCE BOOK**

1. R. Ananthnarayan & C.K. Jayram Panikar Text book of Microbiology – (TheOrient Blackswan)

**INTERNAL ASSESSMENT:**

1. Two exams – Terminal and preliminary examination of80 marks each TOTAL - 160 marks
2. Internal Assessment to be calculated out of 20 marks
3. Internal assessment as per University pattern

## SCHEME OF UNIVERSITY EXAMINATION (THEORY ONLY)

| **THEORY - PATHOLOGY & MICROBIOLOGY** | | **Marks** |
|---|---|---|
| Pathology-40 marks + Microbiology-40 marks 80marks + I.A.:20 marks<br>[There shall be no LAQ in this paper]<br>*Emphasis to be given to topics related to Musculo Skeletal / Neurological / Cardiovascular / Respiratory conditions & Wound / Ulcers. | | 100 |
| **Section A** | Questions based on **PATHOLOGY**<br>SAQ -1 - Answer any FOUR out of FIVE [4 x 5marks = 20marks]<br>SAQ -2- Answer any FOUR out of FIVE [4 x 5marks = 20marks] | 40 |
| **Section B** | Questions based on **MICROBIOLOGY**<br>SAQ -3 – Answer any FOUR out of FIVE [4 x 5marks = 20marks]<br>SAQ-4 - Answer any FOUR out of FIVE [4 x 5marks = 20marks] | 40 |
| **Total Marks** | | **80** |

# PSYCHOLOGY-P203

**Total 30hrs**

**(UNIVERSITY EXAMINATION)**

**COURSE DESCRIPTION:**

The course design increases awareness of psychosocial issues faced by individuals. Their significance at various points on the continuum of health and disability should be emphasized. The course discusses personal and professional attitudes and values as they relate to developing therapeutic relationships. It emphasizes on communication skills for effective interaction with patients, health-care professionals and others. It expects students to identify common psychiatric conditions.

**COURSE OBJECTIVES:**

At the end of the course, the candidate will be able to:

**Cognitive:**

- Define the term Psychology & its importance in the Health delivery system, & will gain knowledge of Psychological maturation during humandevelopment, growth & alterations during aging process.
- Understand the importance of psychological status of the person in health & disease; environmental & emotional influence on the mind &personality.
- Have the knowledge and skills required for good interpersonal communication.

**Psychomotor:**

- Enumerate various psychological disorders with special emphasis tomovement / pain & ADLs
- Acquire the knowledge in brief, about the pathological & etiological factors, signs / symptoms & management of various Psychiatric conditions.
- Understand the patient more empathetically.

**COURSE OUTCOME:**

- At the end of the course student will understand importance of psychology to physiotherapy practice.
- At the end of the course student will have thorough knowledge of psychological aspects related to other systemic diseases.

| SR.NO | TOPIC | THEORY HOURS |
|---|---|---|
| 1 | Psychology: Definition, understanding, nature & its fields and subfields | **1** |
| 2 | Developmental psychology (childhood, adolescence,adulthood and old age) and its theories in brief | **2** |
| 3 | Learning – Role of learning in human life – Conditioning | **2** |
| 4 | Memory – types – Forgetting causes | **2** |
| 5 | Attention & perception Natureof attention ,Nature of perception Principles of Grouping | **1** |
| 6 | Conflict & Frustration – Types –Common Defense mechanismstress-common reactions, frustrations | **2** |
| 7 | **Clinical Psychology**<br>i. Introduction<br>ii. Difference between normal & abnormal psychology<br>iii. Anxiety disorders – Phobias, Obsessive-compulsive, Hysterical, convulsion disorder<br>iv. Affective disorders – Depression, mania, Bipolar disorders<br>v. Psychotic disorders – Types of Schizophrenia | **20** |

**RECOMMENDED TEXT BOOKS**


1. Morgan C.T. & King R.A. Introduction To Psychology Recent Edition (Tata Mcgraw-Hill Publication)
2. Munn N.L. Introduction To Psychology (Premium Oxford, I.B.P. PublishingCo.)
3. Clinical Psychology – Akolkar,(Asia Publishing House)
4. Developmental Psychology-Elizabeth B. Hurlock ( Tata Mc-Graw Hill)


**RECOMMENDED REFERENCE BOOKS:**


1. Ahuja ; A Short Book Of Psychiatry -(Jaypee Bros – Medical Publishers)
2. M.S. Bhatia: Short Textbook of Psychiatry- (New Age International Pvt. Limited)
3. Shah L.P.; Handbook of Psychiatry (Vora Medical Publication

**INTERNAL ASSESMENT:**

1. Two exams – Terminal and preliminary examination (Theory only) of 40marks each

   TOTAL - 80 marks

2. Internal Assessment to be calculated out of 10 marks (Theory only)
3. Internal assessment as per University pattern**.**

**SCHEME OF UNIVERSITY EXAMINATION**

| **THEORY- PSYCHOLOGY**<br><br>40 marks + **I.A.** – 10 Marks<br>[There shall be no LAQ in this paper]<br><br>* The question paper will give appropriate weightage to all the topics in the Syllabus. | | Marks<br><br>50 |
|---|---|---|
| **Section-A** | SAQ- 1 Answer any FOUR out of FIVE[4 x 5marks = 20marks] | 20 |
| **Section A** | SAQ –2 Answer any FOUR out of FIVE[4 x 5marks = 20marks] | 20 |
| **Total Marks** | | **40** |

# KINESIOLOGY - P204

**Total 100 hrs.**

**(UNIVERSITY EXAMINATION)**

**COURSE DESCRIPTION:**

This course is based on anatomical, physiological & related kinesiological principles fornormal human movement. Students have the opportunity to develop and acquire understanding of kinesiological responses for the efficacy in various kinesiotherapeuticapplications

**COURSE OBJECTIVES:**

**At end of the course:**

**Cognitive:**

- Able to understand the Basics of mechanics of force system, equilibrium, lever andpulley.
- Able to Describe the joint structure, classification and function of joints And biomechanics of Connective tissue
- Able to Describe the muscle structure and function of muscles, types of muscles,contractions and factors effecting muscle recruitment and function
- Able to Describe all the regional joint biomechanics and its applied

**Psychomotor:**

- Acquire the skills of analysis of kinetic and kinematics of vertebral column.
- Acquire the skills of analysis of kinetic and kinematics of all peripheral joints

**COURSE OUTCOME:**

On successful completion of this programme, students should be able to describe the understanding of basics of mechanics, muscle structure and contraction, factors effecting muscle contraction and recruitment , explain mechanics of chest wall during various movements and the patho-mechanics associated with various chest conditions and deformities, understand normal mechanics and patho mechanics of TMJ associated with various conditions,explain mechanics of all peripheral joints and the patho-mechanics.

| SR. NO | TOPIC | THEORY HOURS |
|---|---|---|
| 1 | **INTRODUCTION TO BIOMECHANICS** | **20** |
| | **a.Muscle Biomechanics** | |
| | h.Elements of muscle structure – fiber, size, motor unit,length tension, arrangement & number relationship | 10 |

| | | |
|---|---|---|
| | ii.Classification of muscles | |
| | iii.Mobility and Stability of muscles | |
| | iv.Types of muscle contraction and factors affecting muscle function | |
| | **b.Joint Biomechanics** | 10 |
| | i.Basic principles of joint design | |
| | ii.Classification of joints | |
| | iii.Osteokinematics & Arthrokinematics | |
| | iv.Concave Convex Rule | |
| | v.Joint function, kinetics & kinematics | |
| 2 | **REGIONAL KINESIOLOGY** | **60** |
| | a. Vertebral Column | 15 |
| | b.Thorax | 5 |
| | c.Shoulder Complex | 6 |
| | d.Elbow joint | 3 |
| | e.Wrist And Hand Complex | 6 |
| | f. Hip Joint | 6 |
| | g. Knee Complex | 10 |
| | h. Ankle – Foot complex | 6 |
| | i. Temporo-Mandibular Joint | 3 |
| 3 | **MOTOR CONTROL** | **10** |
| | a. Motor Control | |
| | b. Postural Alignment & Weight Distribution | |
| | c. Sensory Organisation | |
| | d. C.N.S. Integration | |
| | e. Motor Strategies | |
| 4 | **KINETICS AND KINEMATICS OF VARIOUS ACTIVITIES OF DAILY LIVING** | **10** |
| | i.Supine to Sitting, Sitting to Standing, Squatting,Climbingup & down | |
| | ii.Lifting, Pulling, Pushing, Overhead activities | |
| | iii.Running, Jogging. | |

**RECOMMENDED TEXT BOOKS**

1. Cynthia .C. Norkins ; Joint Structure And Function – (F.A. Davis Company)
2. Brunnstrom ; Clinical Kinesiology – (F.A. Davis Company)
3. Physiology Of The Joints – Kapandji Vol.- I,Ii,&Iii (Churchill Livingstone)

**RECOMMENDED REFERENCE BOOKS**

1Steindler ;Kinesiology Of The Human Body – (Charles Thomos Publisher)
1. Neumann & Donald ;Kinesiology Of The Musculoskeletal System – (Mosby)
2. Oatis& Carol ;Kinesiology – The Mechanics And Pathomechanics Of Human Motion – (Lippincot Williams And Wilkins)
3. Joseph And Hamill ;Biomechanical Basis Of Human Motion – (Lippincot Williams And Wilkins)

**INTERNAL ASSESSMENT:**

1. Two exams – Terminal and preliminary examination (Theory&Practical) of 80 marks each **TOTAL - 160 marks.**
2. Internal Assessment to be calculated out of 20 marks.
3. Internal assessment as per University pattern

**SCHEME OF UNIVERSITY EXAMINATION**

| **THEORY- KINESIOLOGY**<br><br>80 MARKS + I.A. – 20 MARKS<br>* The question paper will give appropriate weightage to all the topics in the syllabus. | | **Marks**<br><br>**100** |
|---|---|---|
| **Section A-** | Q-1 **Answer any TWO out of THREE** [2 x 10 = 20 marks]<br>( Muscle Mechanics, Regional Kinesiology- Topic 2- a,b,c,d)<br>Q-2 **Answer any FOUR out of FIVE** [4 x 5 = 20 marks]<br>(Entire syllabus topics to be covered ) | **40** |
| **Section B** | **Q-3. Answer any TWO out of THREE** [2 x 10 = 20 marks]<br>( Joint Mechanics, Regional Kinesiology- Topic 2- e,f,g,h,i )<br>**Q-4. Answer any FOUR out of FIVE** [4 x 5 = 20 marks]<br>(Entire syllabus topics to be covered) | **40** |
| | **Total Marks** | **80** |

# KINESIOTHERAPY- P205

**Theory-83 Hrs + Practical/ Laboratory- 162 Hrs = Total - 245 Hrs**

**(UNIVERSITY EXAMINATION)**

**COURSE DESCRIPTION:**

This course is based on anatomical and physiological & related kinesiological principles for normal human movement and for the efficacy in the assessment methods for mobility, muscle strength. Students have the opportunity to develop and acquire understanding of physiological responses to various types of training and develop skills of exercise programs (on models). Exercise components of muscle strength, flexibility, balance,breathing and gait are examined. Evidence of appropriate, safe and effective exercise design and proper exercise biomechanics and prescription parameters are addressed with all interventions

**COURSE OBJECTIVES**

At the end of the course, the candidate will be able to

**Cognitive:**

- Describe the Biophysical properties of connective tissue, & effect of mechanical loading, &factors which influence the muscle strength, & mobility of articular & periarticular soft tissues.

**Psychomotor:**

- Apply the biomechanical principles for the efficacy in the assessment methods formobility, muscle strength
- Acquire the skill of subjective and objective assessment of individual & group musclestrength
- Acquire the skills of subjective and objective methods of muscle strengthening
- Describe the physiological effects, therapeutic uses, merits / demerits of various exercise modes including Hydrotherapy
- Demonstrate various therapeutic exercises on self;& acquire the skill of application on models with Home Programs
- Analyze normal Human Posture [static & dynamic].
- Acquire the skill of functional re-education techniques on models
- Acquire the skill of Balance and Coordination Exercises
- Acquire the skill of using various walking aids for Gait Training
- Acquire the skill of demonstrating breathing exercises and retraining on self and others
- Acquire the skill of demonstrating Postural Drainage on models

**Affective:**

- Be able to develop behavioral skills and humanitarian approach whilecommunicating with models
- Be able to develop bed side behavior, respect & maintain confidentiality

**COURSE OUTCOME:**

At the completion of course the student shall be able to describe the basics of neuromusculario-ordination involved in exercise therapy, describe and demonstrate functional reeducation, describe and demonstrate soft tissue manipulations, demonstrate and apply different techniques to correct posture & gait and able to perform various assessment techniques needed during patient assessment

| SR.NO | THEORY TOPIC | THEORY HOURS | PRACTICAL HOURS |
|---|---|---|---|
| 1 | **Biophysics** | **40** | **111** |
| | **a. Biophysical Principles:** | 2 | |
| | i. Structures & Properties of connective and non-connective tissues | | |
| | **b. Stretching :** | 3 | 12 |
| | i. Definition | | |
| | ii. Types | | |
| | iii. Assessment of muscle length and fascia around the joint | | |
| | iv. Principles of stretching | | |
| | v. Techniques for all joints Individual muscle stretching | | |
| | **c. Joint Mobility :** | 10 | 17 |
| | i. Definition | | |
| | ii. Causes of limitation | | |
| | iii. Indication and contra indications | | |
| | iv. Principles | | |
| | v. Techniques | | |
| | vi. Assessment methods | | |

| | | | |
|---|---|---|---|
| | vii. Individual joints mobility Exercises– Upper Limb, Lower Limb & Spine (Using active, assisted, passive movements) | | |
| | **d. Manual Muscle Testing and assessment (subjective & objective) :** | 6 | 35 |
| | i.Principle | | |
| | ii. Trick movements | | |
| | iii.Group Muscle Testing | | |
| | iv.Individual Muscle testing – Upper & Lower Limbs, Trunk & Face | | |
| | **e. Muscle Strengthening** | 10 | 45 |
| | i. Concepts -Strength, Power, Endurance | | |
| | ii. Factors influencing the Strength of normal muscle/ hypertrophy, recruitment of motor units, change after the training, training with isometric, isotonic & Isokinetic muscle contraction | | |
| | iii. Principles: Overload, Intensity, Motivation, Learning, Duration, Frequency, Reversibility, Specificity, Determinants | | |
| | iv. Methods : Subjective & Objective | | |
| | v. Individual joint Strengthening Exercises Upper Limb, Lower Limb & Spine | | |
| | vi. Concepts- 1 RM, 10 RM & Dynamometry | | |
| | vii. Progressive Resisted Exercise - Delorme,Zinoveiff, Mc queen protocols | | |
| | viii. Use of gymnasium equipments | | |
| | **f. Hydrotherapy** | 4 | |
| | i. Physiological effects | | |
| | ii. Indication and Contraindications | | |
| | iii.Techniques | | |
| | **g. Traction (Cervical & Lumbar):** | 3 | 2 |

| | | | |
|---|---|---|---|
| | i.Introduction | | |
| | ii. Types( Mechanical / Electrical, Continuous/Intermittent) | | |
| | iii.Indications and Contra indications | | |
| | iv. Techniques v. Effects and uses | | |
| | **h. Home Program** | 2 | |
| | i. Principles | | |
| | ii. Ergonomic advice for ADLs | | |
| | iii. Home based exercise program | | |
| 2 | **POSTURE** | **5** | **5** |
| | a. Definition<br>b. Human posture –Changes from quadruped to biped | | |
| | c. Correct and faulty posture | | |
| | d. Postural patterns and Postural Mechanism | | |
| | e. Factors affecting posture | | |
| | f. Physiological deviations | | |
| | g. Analysis of all views | | |
| **3** | **FUNCTIONAL REEDUCATION** | **5** | **5** |
| | a.Principles & Indications | | |
| | b. Mat exercises- mobility, strength and balance training | | |
| | c. Progression to sitting, standing and walking | | |
| | d. Transfers | | |
| **4** | **NEUROMUSCULAR CO-ORDINATION AND BALANCE** | **5** | **5** |
| | a. Definition | | |
| | b. Physiology related to coordination & Balance | | |
| | c. Frenkels exercise ( Principles & Techniques) | | |
| | d. Balancing Exercise | | |
| 5 | **GAIT** | **10** | **10** |
| | i. Definition | | |

| | | | |
|---|---|---|---|
| | ii. Subjective & Objective evaluation | | |
| | iii. Gait cycle and measurable Parameters (Step Length, Step Width, Stride Length, Foot Angle, Cadence | | |
| | iv. Kinetics and kinematics of gait | | |
| | v. Determinants of gait | | |
| 6 | **WALKING AIDS** | **6** | **5** |
| | i. Types | | |
| | ii. Indications | | |
| | iii. Selection / Prescription | | |
| | iv. Pre Crutch training | | |
| | v. Measurements | | |
| | vi. Gait with walking aids | | |
| 7 | **BRONCHIAL HYGIENE** | **12** | **21** |
| | **a. Humidification & Nebulisation** | 3 | 1 |
| | i. Definition | | |
| | ii. Types | | |
| | iii. Method of delivery | | |
| | iv. Indications and contraindications | | |
| | **b. Breathing Exercise** | 5 | 10 |
| | i. Types – Inspiratory , Expiratory (including forced expiratory technique) | | |
| | ii. Goals & Uses | | |
| | iii. Techniques | | |
| | iv. ACBT | | |
| | v. Autogenic drainage | | |
| | **c. Postural Drainage:** | 4 | 10 |
| | i. Definition | | |
| | ii. Indications & Contraindications | | |
| | iii. Assessment & Principles | | |

| | | | |
|---|---|---|---|
| | iv. Techniques | | |

**RECOMMENDED TEXT BOOKS**

1. Margaret Hollis ;Progressive Resisted Exercises – ( Wiley)
2. Carolyn Kisner ; Therapeutic Exercise Foundation And Techniques - (Fa Davis)
3. Daniel Kendall ; Muscle Testing - (Lippincot Williams And Wilkins)
4. Dena Gardiner ; Principles Of Exercise Therapy – (Cbs)
5. Cash's Textbook For Physiotherapists In Chest, Heart & Vascular Diseases ( Mosby)

**RECOMMENDED REFERENCE BOOKS**

1. Basmajian & Wolf.; Therapeutic Exercise - Lippincot Williams And Wilkins)
2. David Magee ; Orthopedic Physical Assessment – ( Elsevier India)
3. O'sullivan ; Physical Rehabilitation- (Jaypee Brothers Medical)
4. Prior & Prasad; Physiotherapy for Respiratory and Cardiac Problems , Adults & Paediatrics , Elsevier India .

**INTERNAL ASSESSMENT:**

1. Two exams – Terminal and preliminary examination (Theory&Practical) of 80 marks each TOTAL - 160 marks.

2. Internal Assessment to be calculated out of 20 marks.

3. Internal assessment as per University pattern

## SCHEME OF UNIVERSITY THOERY EXAMINATION

| THEORY- KINESIOTHERAPY<br>80 MARKS + I.A. – 20 MARKS<br>* The question paper will give appropriate weightage to all the topics in the syllabus. | | Marks<br>100 |
|---|---|---|
| **Section-A** | **Q-1. Answer any TWO out of THREE** [2 x 10 = 20 marks]<br>( Joint Mobility, Strengthening, Stretching)<br>**Q-2. Answer any FOUR out of FIVE** [4 x 5 = 20 marks]<br>( Entire syllabus topics to be covered )] | **40** |
| **Section-B** | **Q-3. Answer any TWO out of THREE** [2 x 10 = 20 marks]<br>(Posture, Gait, Neuromuscular Co-ordination, Postural Drainage)<br>**Q-4. Answer any FOUR out of FIVE** [4 x 5 = 20 marks]<br>(Entire syllabus topics to be covered ) | **40** |
| **Total Marks** | | **80** |

## SCHEME OF UNIVERSITY PRACTICAL EXAMINATION

| PRACTICAL- KINESIOTHERAPY<br>80 MARKS + I.A. – 20 MARKS | | Marks<br>100 |
|---|---|---|
| **LONG CASE** | Muscle Strengthening / Stretching / Mobility /Bronchial hygiene (On models) | **30** |
| **SHORT CASE** | **TWO SHORT CASES:**<br>**1. SHORT CASE ONE:**<br>M.M.T./Coordination/Posture/Gait (Measurable parameters Only) [1x20=20 marks]<br>**2. SHORT CASE TWO:**<br>Walking aids/ Functional Reeducation / Breathing Exercises [1 x 20 = 20 marks] | **40** |
| **COMMUNICATION SKILL** | | **5** |
| **JOURNAL** | Documentation- Principles & applications for various Kinesiotherapeutic techniques. | **5** |
| **Total Marks** | | **80** |

# ELECTROTHERAPY- P206

**Theory 100 hrs+ Practical / Laboratory 100 = Total 200 Hrs**
**(UNIVERSITY EXAMINATION)**

**COURSE DESCRIPTION:**

This course tends to explore fundamental skills in application of electrotherapeutic modalities and knowledge of indications, contraindications and physiological principles needed for appropriate patient care. It includes topics such as Electrical stimulation, T.E.N.S., Iontophoresis, Ultrasound / Phonophoresis, Diathermy and Electro diagnostic testing etc.

**COURSE OBJECTIVES:**

At the end of the course, the candidate will be able to:

**Cognitive:**

- Acquire the knowledge about the physiology of pain, Pain pathways& Methods of pain modulation, selection of appropriate modality forPain modulations.
- Describe the Physiological effects, Therapeutic uses, indication &contraindications of various Low/ Medium & High Frequency modes / Actinotherapy
- Describe the Physiological Effects & therapeutic uses of various therapeutic ions & topical pharmaco -therapeutic agents to be used forthe application of iontophoresis & sono/ phonophoresis

**Psychomotor:**

- Acquire the skills of application of the Electro therapy modes onmodels, for the purpose of Assessment & Treatment.
- Acquire an ability to select the appropriate mode as per the tissuespecific &area specific application.

**Affective:**

- Be able to develop behavioral skills and humanitarian approach whilecommunicating with models
- Be able to develop bed side behavior, respect & maintain confidentiality

**COURSE OUTCOMES:**

- Able to demonstrate the techniques of application of various electrotherapymodalities.
- Able to select the appropriate modalities in different conditions
- Able to select the appropriate dosages of different Electrotherapy modalities to achieve the different goals.

| SR.NO | TOPIC | THEORY HOURS | PRACTICAL HOURS |
|---|---|---|---|
| 1 | **Pain** | **3** | |
| | i.Introduction to Pain | | |
| | ii.Physiological response to pain | | |
| | iii.Pain pathways | | |
| | iv.Pain Gate mechanism | | |
| 2 | **Low Frequency Currents** | **37** | **44** |
| | **a. Faradic Currents** | 12 | 12 |
| | Faradic currents: Physiological &Therapeutic effects indications, contraindications | | |
| | i.Faradic type | | |
| | ii. Strong Surged Faradic | | |
| | iii. Sinusoidal currents | | |
| | Application of Faradic current - Faradism Under pressure – Indications, Principle of application, Technique of application | | |
| | Faradic re-education: Indications, Principle of application, Technique Of application | | |
| | Short/Long pulse currents Motor Points: Definition., Identification | | |
| | **b. Galvanic Currents** | 12 | 10 |
| | Galvanic / Direct currents (Continuous DC & Interrupted DC) :Physiological & Therapeuticeffects, Indications, Contraindications | | |

| | | | |
|---|---|---|---|
| | a. Definition: Galvanic & Interrupted Galvanic Currents | | |
| | ii. Property of Accommodation | | |
| | iii. Technique & Methods of Application of Galvanic currents | | |
| | iv. Types – Anodal &Cathodal, Therapeutic | | |
| | v. Ionization /Iontophoresis: Theory of Medical Ionisation,Effects & Uses of various Ions, Indications and contraindications, Dangers and precautions | | |
| | **c.TENS** | 5 | 12 |
| | Introduction to Pain relieving Modalities, Definition TENS, Types of TENS | | |
| | To Know Physiological & Therapeutic effects of TENS | | |
| | To Know Techniques and Methods of Applications of TENS | | |
| | To know Indications & contraindications of TENS | | |
| | **d. High Voltage Currents** | 1 | 1 |
| | **e. Micro Currents e. Didynamic Currents Topic** | 1 | 1 |
| | **f. S-D Curve** | 6 | 8 |
| | i. Principle of S-D curves | | |
| | ii. Technique of plotting | | |
| | iii. Interpretation of normalcurves. | | |
| | iv. Chronaxie and Rheobase | | |
| 3 | **Medium FrequencyCurrents** | **10** | **12** |
| | a) To know interfrential current,Definition IFT, and itsprinciple | | |
| | b) To Know Physiological &Therapeutic effects of IFT | | |

| | | | |
|---|---|---|---|
| | c) To know Indications &contraindications of IFT | | |
| | d) To know Technique & Methods of Application of IFT | | |
| | e) To know Russian current,Definition, Indication, contraindication & its Parameters | | |
| 4 | **Biofeedback** | **5** | |
| | i. Different types of feedback | | |
| | ii. Principles of using biofeedback | | |
| | iii.Uses of Biofeedback EMG | | |
| 5 | **High Frequency Currents** | **20** | **20** |
| | **a. Short Wave Diathermy** | 10 | 10 |
| | i.Definition of electromagnetic fields | | |
| | ii. Introduction to short wave diathermy | | |
| | iii. Physiological effects of SWD | | |
| | iv. Therapeutic effects of SWD | | |
| | v. Principles of application | | |
| | **b. Ultrasound** | 10 | 10 |
| | i.Definition of ultrasound, infrasonics andhearing band. | | |
| | ii. Physiological effects | | |
| | iii.Therapeutic effects | | |
| | iv. Inference of sound waves | | |
| | v. Phonophoresis | | |
| | vi.Indication and contraindications ofultrasound | | |
| | vii. Dangers of ultrasound | | |
| | viii. Precautions of ultrasound | | |
| | ix. Technique of application | | |
| | x. Methods of application | | |

| | | | |
|---|---|---|---|
| 6 | **Actinotherapy** | **17** | **21** |
| | **a. Infra-Red Radiations** | 5 | 11 |
| | i. Introduction to infrared radiations, physiological and therapeutic effects | | |
| | ii.Technique and method of application | | |
| | iii. Effects and uses | | |
| | iv.Indications and contraindications | | |
| | v.Precautions and potential dangers | | |
| | **b.Ultraviolet Radiations** | 8 | 10 |
| | i. Types : a, b, c | | |
| | ii. Physiological & Therapeutic effects | | |
| | iii. Technique & Method of application | | |
| | iv. Effects & uses | | |
| | v.Indications & contraindications | | |
| | vi. Dangers & Precautions | | |
| | **c.LASER** | 4 | |
| | i. Physiological & Therapeutic effects | | |
| | ii. Technique & Methods ofApplication | | |
| | iii. Effects & Uses | | |
| | iv. Indications & Contraindications | | |
| | v. Dangers & Precautions | | |
| | vi. Dosage | | |
| 7 | **Advanced Electrotherapeutics** | **5** | |
| 8 | **Wound Care** | **3** | **3** |
| | i. Types of wound | | |
| | ii. Application of Therapeutic currents, Ultrasound, U.V.R. & LASER | | |

**RECOMMENDED TEXT BOOK**

1. Clayton's Electro Therapy (Cbs)
2. Low & Reed ; Electro Therapy Explained – (Elsevier India)
3. Principle And Practice Of Electro Therapy – (Churchill Livingstone)
4. Kahn ; Therapeutic Electricity – Sydney Litch (Waverly Press)
5. Sheila Kitchen ; Electrotherapy Evidence Based Practice – (ChurchillLivingstone)
6. Basics of Electrotherapy – Subhash M. Khatri (Jaypee)

**RECOMMENDED REFERENCE BOOK**

1. Clinical Electro Therapy – Nelson & Currier (Pearson)

**INTERNALASSESSMENT:**

**1.** Two exams – Terminal and preliminary examination (Theory & Practical)
Of 80 marks each TOTAL - 160 marks.

**2.** Internal Assessment to be calculated out of 20 marks

**3.** Internal assessment as per University pattern

## SCHEME OF THEORY UNIVERSITY EXAMINATION

| THEORY- ELECTROTHERAPY<br>80 MARKS + I.A. – 20 MARKS | | Marks |
|---|---|---|
| * The question paper will give appropriate weightage to all the topics in the syllabus. | | **100** |
| **Section A** | **Q-1. Answer any TWO out of THREE** [2 x 10 = 20 marks]<br>(Low Frequency- Faradic/IFT, Medium Frequency, High Frequency- SWD )<br>**Q-2. Answer any FOUR out of FIVE** [4 x 5 = 20 marks]<br>(Entire syllabus topics to be covered ) | **40** |
| **Section B** | **Q-3. Answer any TWO out of THREE** [2 x 10 = 20 marks]<br>(Low Frequency- Galvanic/TENS, Medium Frequency, High Frequency- U.S )<br>**Q-4. Answer any FOUR out of FIVE** [4 x 5 = 20 marks]<br>(Entire syllabus topics to be covered ) | **40** |
| **Total Marks** | | **80** |

## SCHEME OF PRACTICAL UNIVERSITY EXAMINATION

| PRACTICAL- ELECTROTHERAPY<br>80 MARKS + I.A. – 20 MARKS | | Marks<br>100 |
|---|---|---|
| **LONG CASE** | Motor points /Strength Duration Curve / Faradismunder pressure (On models) | **30** |
| **SHORT CASES** | 1. Based on Low or Medium Frequency modalities /High Frequency modalities<br>2. Actinotherapy (I.R./U.V.R./LASER)<br>2 x 20 = 40marks<br>(Skill of application on models & rationale for selection of modality) | **40** |
| **COMMUNICATION SKILL** | | **5** |
| **JOURNAL** | Documentation- Principles & applications forvarious Electrotherapy Modalities. | **5** |
| **Total Marks** | | **80** |

**COMPUTER APPLICATION- P207**
**Total 40 Hrs**

**(COLLEGE EXAMINATION)**

**COURSE DESCRIPTION:**

This Course describes –Basic Operation of Computer, Various Input and Output devices, Secondary Storage Devices, Detailed study of Components of CPU and Introduction to MS Word, MS Power point, MS Excel

**COURSE OBJECTIVES:**

- The course is designed to create awareness among thestudents about basic operation of Computer.
- Creating the MS documents, power point presentation andExcel

**COURSE OUTCOME:**

At the end of the session students would be able understand the basic operation ofcomputer and creating the documents, power point presentation and making spreadsheets in Excel along with the formulas

| SR.NO | TOPIC | THEORY HOURS |
|---|---|---|
| 1 | **Basics of Computer**<br>i. Input devices<br>ii. Output devices<br>ii. Secondary storage device<br>iii. Components of CPU<br>iv. Working of Word pad | 5 |
| 2 | **Hardware and Software**<br>i. Working of hardware and software<br>ii. Working of MS power point | 5 |
| 3 | **Multimedia**<br>Basics of utility of multi- media | 5 |
| 4 | **Operating system**<br>i. Develop basic knowledge of Linux, Unix, DOS, Windows OS | 5 |
| 5 | **Network**<br>i. Intranet, Extranet and Internet<br>ii. Skills of web surfing for literature, research relevance to the field of medicine | 5 |

| | | |
|---|---|---|
| **6** | **Microsoft**<br>i. Working and preparing of MS –Excel, Word<br>ii. Skill of spread sheet software. | **5** |
| **7** | **Power Point Presentation** | **5** |
| **8** | **Scientific Poster Designing**<br>b.Scientific Posters using Microsoft office publisher | **5** |

**RECOMMENDED TEXT BOOK**


1. Priti Sinha ;Computer Fundamentals : Concept System And Application By (Bpb)
2. Soumya Behera ;Computer Application, (B.K.Publicatios Private Limited)
3. Renu kapoor ;Introduction To Computer-. Lotus Publishers


**SCHEME OF PRACTICAL COLLEGE EXAMINATION-**

| **COMPUTER APPLICATION** | **Marks- 30** |
|---|---|
| COMPUTER APPLICATION BASED CASE 1 | 10 |
| COMPUTER APPLICATION BASED CASE 2 | 10 |
| COMPUTER APPLICATION BASED CASE 3 | 10 |
| **Total** | **30** |

**Passing in the exam is Mandatory:-**

Grades: A+ = 75% & above, A = 66 to 74.5%, B + = 55 to 65 %, B = 50 to 54.5%, C= Fail, less than50%.

**ENVIRONMENTAL STUDIES-P208**
**Ability Enhancement Compulsory Course; UGC**

**Theory 30 Hours**
**(UNIVERITY EXAMINATION)**

**COURSE DESCRIPTION:**

The course is designed to develop the basic knowledge about the biodiversity and Ecosystem with respect to natural resources. It also helps to describe the social issuesand environment.

**COURSE OBJECTIVES:**

The objective of this course is that, the student will be able to understand the population growth, human rights and value education.In addition student will also aware about the Women and Child Welfare. Student will also aware about the rural and urban problemsand its conservation.

**COURSE OUTCOME:**

At the end of the course, the student will be able to understand the

- The multidisciplinary nature of environmental studies
- Natural Resources Renewable and non-renewable resources
- Ecosystems ,Biodiversity and its conservation
- Social Issues and the Environment
- Human Population and the Environment

**COGNITIVE:**

- Acquire the knowledge about nature, scope and importance of environmental studies, Ecosystem, Renewable and non-renewable resources.
- Describe environmental Hazards and laws, policies and practices.
- Describe the human communities and the environments.

| SN | TOPIC | THEORY HOURS |
|---|---|---|
| 1 | **Introduction to environmental studies** | **2** |
| | i. Multidisciplinary nature of environmental studies; | |

| | | |
|---|---|---|
| | ii. Scope and importance; Concept of sustainability and sustainable development. | |
| 2 | **Ecosystems** | **4** |
| | • What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems :<br>a) Forest ecosystem<br>b) Grassland ecosystem<br>c) Desert ecosystem<br>d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) | |
| 3 | **Natural Resources: Renewable and Non--renewable Resources** | **5** |
| | • Land resources and land use change; Land degradation, soil erosion and desertification.<br>• Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.<br>• Water: Use and over-¬-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-¬-state).<br>• Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies. | |
| 4 | **Biodiversity and Conservation** | **4** |
| | • Levels of biological diversity : genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots. | |

| | | |
|---|---|---|
| | • India as a mega-¬-biodiversity nation; Endangered and endemic species of India<br>• Threats to biodiversity : Habitat loss, poaching of wildlife, man-¬-wildlife conflicts, biological invasions; Conservation of biodiversity : In-¬-situ and Ex-¬-situ conservation of biodiversity.<br>• Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value. | |
| 5 | **Environmental Pollution** | **4** |
| | · Environmental pollution : types, causes, effects and controls; Air, water, soil and noise pollution | |
| | · Nuclear hazards and human health risks | |
| | Solid waste management: Control measures of urban and industrial waste. | |
| | · Pollution case studies. | |
| 6 | **Environmental Policies & Practices** | **4** |
| | • Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture<br>• Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).<br>• Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context. | |
| 7 | **Human Communities and the Environment** | **4** |

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|---|---|---|
| | • Human population growth: Impacts on environment, human health and welfare.<br>• Resettlement and rehabilitation of project affected persons; case studies.<br>• Disaster management: floods, earthquake, cyclones and landslides.<br>• Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.<br>• Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.<br>• Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi). | |
| 8 | **Field work** | **3** |
| | • Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.<br>• Visit to a local polluted site-¬-Urban/Rural/Industrial/Agricultural.<br>• Study of common plants, insects, birds and basic principles of identification.<br>• Study of simple ecosystems-¬-pond, river, Delhi Ridge, etc. | |

## Suggested Readings:


1. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
4. Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006.
6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36-37.

7. McCully, P. 1996. Rivers no more: the environmental effects of dams (pp. 29-64). Zed Books.
8. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.
9. Odum, E.P., Odum, H.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.
10. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.
11. Rao, M.N. & Datta, A.K. 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.
12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. Environment. 8th edition. John Wiley & Sons.
13. Rosencranz, A., Divan, S., & Noble, M. L. 2001. Environmental law and policy in India. Tripathi 1992.
14. Sengupta, R. 2003. Ecology and economics: An approach to sustainable development. OUP.
15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.
16. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.
17. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.
18. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.
19. Wilson, E. O. 2006. The Creation: An appeal to save life on earth. New York: Norton.
20. World Commission on Environment and Development. 1987. Our Common Future. Oxford University Press.

## SCHEME OF EXAMINATION

| **ENVIRONMENTAL STUDIES** **50 marks** | **Theory** | **Marks- 50** |
|---|---|---|
| SECTION A | Q. 1 Answer any Eight out of Fifteen (8X 5marks= 40 ) | 40 |
| SECTION B | Q. 2 Match the following (10 Marks= 10 ) | 10 |
| **Total** | | **50** |