



## DIPLOMA IN PHYSIOTHERAPY

**DURATION :3 YEARS**

**ELIGIBILITY : 10<sup>TH</sup> PASS**

S.NO	PAPER CODE	NAME OF PAPERS	CREDIT
<b>1<sup>ST</sup> YEAR</b>			
1	101	HUMAN ANATOMY	4
2	102	HUMAN PHYSIOLOGY	4
3	103	FUNDAMENTALS OF KINESIOLOGY & KINESIOTHERAPY	4
4	104	ENGLISH COMMUNICATION & SOFT SKILLS	3
5	105	GENERAL MICROBIOLOGY	4
6	106	FUNDAMENTALS OF ELECTROTHERAPY	4
7	107	COMPUTER FUNDAMENTALS	3
8	108	PRACTICAL-I	3
9	109	CLINICAL TRAINING-I	2
<b>2<sup>ND</sup> YEAR</b>			
1	201	GENERAL PATHOLOGY	4
2	202	GENERAL BIOCHEMISTRY	4
3	203	GENERAL PHARMACOLOGY	4
4	204	ENVIRONMENTAL SCIENCE	2
1	205	EXERCISE THERAPY-I	4
2	206	ELECTROTHERAPY-I	4
3	207	BASIC NURSING AND FIRST AID	4
4	208	PRACTICAL -II	3
5	209	CLINICAL TRAINING-II	2
<b>3<sup>RD</sup> YEAR</b>			
1	301	GENERAL MEDICINE	4
2	302	GENERAL SURGERY	4
3	303	THERAPEUTIC MASSAGE	4
4	304	ORTHOPAEDICS	3
1	305	EXERCISE THERAPY-II	4
2	306	ELECTROTHERAPY-II	4
3	307	BIOMECHANICS	4
4	308	PRACTICAL-III	3
5	309	CLINICAL TRAINING-III	2

## 101 HUMAN ANATOMY

### Unit -1

Terminology and General Plan of the Body, Body Parts and Areas, Terms of Location and Position, Body Cavities and Their Membranes, Dorsal cavity, Ventral cavity, Planes and Sections

### Unit -II

Cells: Structure, function and location, Prokaryotic and eukaryotic cells, Cell organelles, Cell division  
Tissue, Types, Structure, Location and Function of Epithelial Tissue, Connective Tissue, Muscle Tissue, Nerve Tissue, Membranes, Glandular tissue  
The Integumentary System: structure and function of The Skin, Subcutaneous Tissue

### Unit-III

Musculoskeletal System: Basic anatomy of important muscles and bones

### Unit-IV

Respiratory system: Basic anatomy of nose, larynx, trachea, bronchi and lungs

### Unit - V

Digestive system: basic anatomy of oesophagus, stomach, small intestine, large intestine, liver, gall bladder, pancreas

## 102 HUMAN PHYSIOLOGY

### Unit-I

Cell physiology: Structure, membrane, transport across cell membrane, Active, Passive, Organization of the Body, Body Composition, Body Fluid Volumes and its measurement, Diffusion, Osmosis, Tonicity, Homeostasis

### Unit-II

Blood-composition, function, cellular component & their function, haemoglobin & anaemia, blood groups and coagulation  
Lymphatic system-Composition & function of lymph, lymphatic tissue, Immunity with the role of thymus

### Unit-III

Cardiovascular system-general arrange, heart, arteries, veins and capillaries, heart structure and function, cardiac cycle, heart sounds, heart rate, blood pressure, mechanism of circulation, definition of hypertension & shock

### Unit-IV

Respiratory system: parts of respiratory system, mechanism of respiration, pulmonary function, pulmonary circulation, lungs volume, Gas transport between lungs and tissues, Definition of hypoxia, dyspnoea, cyanosis, asphyxia and obstructive airways diseases

### Unit- V

Gastrointestinal physiology: Organs of GIT and their structure & function, secretion, digestion, absorption and assimilation, gastrointestinal hormones, physiology of digestion of carbohydrates, proteins & lipids, Structure & function of liver, spleen, gall bladder & pancreas, Jaundice, Cirrhosis & Pancreatitis

## 103 FUNDAMENTALS OF KINESIOLOGY & KINESIOTHERAPY

### Unit- I

#### BIO-PHYSICS RELATED TO KINESIOTHERAPY

- a. Starting Positions & Derived Positions
- i. Application of stabilityii. BOS, Gravity and muscle work in relation to various positions
- b. Therapeutic Gymnasium

- i. Use of accessories such as Pulleys Springs, Shoulder wheel, Walking aids,
- ii. Finger ladder, Therapeutic balls, Weights, Resistance bands, tubes, & wands
- iii. Applied mechanics of all above accessories
- c. Suspension Therapy
- i. Principles ii. Suspension Apparatus iii. Types of Suspension iv. Effects and uses v. Techniques for individual joints

#### **Unit-II**

#### **CLASSIFICATION OF MOVEMENTS**

- a. Definition and classification b. Principles of movements c. Effects, uses and Techniques (active: assisted, free, assisted-resisted, resisted & passive)

#### **Unit-III**

#### **BASIC EVALUATION**

- a. Assessment of Vital Parameters
- i. Temperature ii. Blood Pressure iii. Heart Rate/ Pulse rate iv. Respiratory Rate v. Chest expansion
- b. Assessment of Sensations and Reflex testing,
- c. Goniometry
- i. Definition and Types of Goniometers ii. Principles iii. Techniques for individual joints with biomechanical principles iv. Uses

#### **Unit-IV**

#### **MASSAGE**

- a. Definition b. Classification c. Principles d. Effects & uses e. Indications and contra indications
- f. Techniques-Upper limb, Lower Limb, Neck, Back, Abdomen, Face & Scalp

#### **Unit-V**

#### **RELAXATION**

- a. Principles, b. Techniques along with their effects & uses
- i. General -Jacobson's, Shavasana & Reciprocal ( Laura Mitchell )
- ii. Local -Heat, Massage, Gentle/Rhythmic passive movements

### **104 ENGLISH COMMUNICATION & SOFT SKILLS**

#### **UNIT-I: Introduction to English language**

- a) Role and significance of English language in the present scenario
- b) English Language: Its relevance for the Indian industry
- c) Introduction to Listening, Speaking, Reading, Writing (LSRW) and benchmarking of the class  
[Note: As part of classroom activity, a guest lecture from an industry representative/Director (CRC) and maintaining progress card for each student on LSRW for future reference]

#### **UNIT-II: Phonetics & Functional Grammar**

- a) Pronunciation and daily usage correction (speak with differences between p/b, s/sh, f/ph, t/d, v/w sounds)
- b) Parts of speech, articles, tenses, verbs and modals
- c) Practice of daily use words, numerals and tongue twisters
- d) Vocabulary building, Construction of simple sentences: Basic sentence pattern, subject and Predicate

[Note: As part of classroom activity, language games, tongue & jaw exercises, simple passages from the newspapers for oral drills in the classroom and practice tests (written and oral)]

#### **UNIT-III: English Communication- About Myself**

- a) Let's talk, making conversation, meeting and greeting
- b) Introducing myself, my family and my friends
- c) My opinions, my likes and dislikes
- d) Life at college, hostel and workplace

[Note: As part of classroom activity, use the Workbook for reference for classroom and home assignments, carry out practice tests (written and oral)]

#### **UNIT-IV: Personality Development**

- a) First impression: Dressing sense, good manners, speaking well and respectably
- b) Positive Attitude: Being happy and alert, a good listener and a good friend
- c) Consultation among peers: Soliciting advice and giving advice
- d) Goal setting, confidence building & handling rejection

[Note: As part of classroom activity, refer Workbook for classroom and home assignments, carry out practice tests (written and oral)]

### **105 GENERAL MICROBIOLOGY**

#### **Unit-I**

Development of microbiology as a discipline, Contributions of Anton von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Alexander Fleming, Edward Jenner  
Introduction to bacterial taxonomy, Classification of Bacteria, Morphology based on size, shape, arrangement, motility, flagella, spores, capsules, cell wall, plasma membrane, pili, ribosomes.

#### **Unit-II**

Microscopy: Study of compound microscope – magnification, numerical aperture, resolution and components of microscope. Dark ground illumination, care of microscope and common difficulties micrometry. Bright Field Microscope, Dark Field Microscope, Phase Contrast Microscope, Fluorescence Microscope, Transmission Electron Microscope, Scanning Electron Microscope

#### **Unit-III**

Cell size, shape and arrangement, cell-wall, composition and detailed structure of Gram-positive and Gram-negative cell walls, Cell Membrane: Structure, function and chemical composition of bacterial cell membranes. Cytoplasm: Ribosome, mesosomes, inclusion bodies, nucleoid, chromosome and plasmids, Endospore: Structure, formation

#### **Unit-IV**

General safety measures used in Microbiology laboratory, Sterilization and disinfection: Various physical methods of sterilization – heat, UV radiation, ionizing radiation, filtration, characters affecting sterilization, auto clave control and sterilization indicators.

Biomedical waste management in a Medical Microbiology laboratory: Types of the waste generated, Segregation, Treatment, Disposal

#### **Unit-V**

Antiseptics & Disinfectants: Definition, types and properties, mode of action, use, qualities of good disinfectants

Chemical disinfectants – phenol and its compounds, alcohol, halogen, heavy metals and quaternary ammonium compounds, aldehyde, gaseous compound. use and abuse of disinfectants. precautions while using the disinfectants.

### **106 FUNDAMENTALS OF ELECTROTHERAPY**

#### **Unit-I**

##### **Fundamentals of Low frequency currents**

##### **i. Basic Physics:**

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**

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:**

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**

a) Definition b) Types ( Electric Shock & Earth shock) c) Severity Causes, Effects & Precaution

v. Static Electricity:

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

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:

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,

ix. Galvanic currents/ Direct current:and interrupted galvanic current, duration, frequency, waveforms& graphicalrepresentation

## **Unit II**

### **b. Fundamentals of High frequency currents**

i. Electro Magnetic Induction:

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:

a) Interruption of current –Switch & Valve b) C-R timing circuit c) Multivibrator Circuit, Pulse Generator d) Current supplied to patient –Impulse type

iii. Magnetism:

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:

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.:

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)2 Smoothing circuit h) Semiconductor and its types i) Diodes & Transistors j) Choke coil

## **Unit-III**

### **c. Electro Magnetic Spectrum**

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

## **Unit-IV**

### **2.ELECTRICAL MODALITIES**

**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.

## **Unit- V**

### **1.SUPERFICIAL THERMAL AGENTS**

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

## **107 COMPUTER FUNDAMENTALS**

## **Unit-I**

Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages. Input output devices: Input devices(keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices(monitors, pointers, plotters, screen image projector, voice response systems).

Processor and memory: The Central Processing Unit (CPU), main memory. Storage Devices: Sequential and direct access devices, magnetic tape, magnetic disk, optical disk, mass storage devices.

#### **Unit-II**

Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.).

#### **Unit-III**

Introduction to MS-Word: introduction, components of a word window, creating, opening and inserting files, editing a document file, page setting and formatting the text, saving the document, spell checking, printing the document file, creating and editing of table, mail merge.

Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs.

Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.

#### **Unit-IV**

Introduction of Operating System: introduction, operating system concepts, types of operating system, Computer networks: introduction, types of network (LAN, MAN, WAN, Internet, Intranet), network topologies (star, ring, bus, mesh, tree, hybrid), components of network.

Electronic Payment Systems: Introduction, Types of Electronic Payment Systems, Digital Token-Based, Electronic Payment Systems, Smart Card and Electronic Payment Systems, Credit Card- Based Electronic Payment Systems, Risk and Electronic Payment Systems.

#### **Unit-V**

Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet.

### **108 PRACTICAL-I**

#### **Practical Human Anatomy**

1. Demonstration of Major organs through models and permanent slides.
2. Demonstration of parts of circulatory system from models.
3. Demonstration of parts of respiratory system from models.
4. Demonstration of digestive system from models.
5. Demonstration of excretory system from models.
6. Demonstration of nervous system from models.
7. Structure of eye and ear
8. Demonstration of structural differences between skeletal, smooth and cardiac muscles.
9. Demonstration of various bones
10. Demonstration of various joints
11. Demonstration of various parts of male & female reproductive system from models

#### **Practical Human Physiology**

1. To measure pulse rate
2. To measure blood pressure
3. Demonstration of ECG
4. To perform Hemoglobin by Sahli's Method
5. To perform Hemoglobin by CMG method.
6. Haemoglobin by CMG method.
7. To perform Total RBC count.

8. To perform total leucocyte count.
9. To perform differential leucocyte count.
10. To perform PCV
11. To calculate Red cell indices.

#### **Practical fundamentals of kinesiology & kinesiotherapy**

1. Various starting and derived positions
2. The techniques of active, passive, assisted and resisted movements
3. The techniques of various accessories and equipments used in therapeutic gymnasium its biomechanical principles and uses.
4. The techniques of use of suspension method for assisted and resisted movements
5. Relaxation procedures
6. Massage techniques
7. Yogasanas and Pranayama
8. Aerobic exercise for self and others
9. Assessment of vital parameters in different body position (supine, sitting and standing) and of sensory system and reflexes.
10. Measurement of joint R.O.M. throughgoniometry, method of fixation and measurement.

#### **Fundamentals of Microbiology**

1. Demonstration of Microscope and its parts
2. Demonstration of glassware used in microbiology.
3. Demonstration of autoclave and sterilization of glass wares.
4. Demonstration of Hot air oven and sterilization of glass wares.
5. To perform Gram staining
6. To perform Acid fast staining (Zeihl Neelsen staining)
7. To perform Indian ink staining
8. To perform Hanging drop method
9. Demonstration of capsule
10. Staining of bacterial spores
11. To demonstrate agglutination reaction.
12. To perform RA test
13. To perform WIDAL test
14. To perform RPR test.
15. To perform CRP test.

#### **Practical Fundamentals of Biochemistry**

1. Various ELECTRICAL COMPONENTS like Diodes & Triodes, Rheostat, Capacitor, Potentiometer, Switches, Plugs and Pulse generator
2. The technique of testing of mains supply
3. The techniques of testing the following ALONG WITH PANEL DIAGRAM:
  - i. Low Frequency currents-Diagnostic Muscle stimulator, Transcutaneous Nerve Stimulation
  - ii. Medium Frequency currents-I.F.T.
  - iii. High Frequency currents-Short Wave Diathermy, Ultrasound
  - iv. I.R. (no panel diagram)
  - v. U.V.R. (no panel diagram)
  - vi. LASER (no panel diagram)
4. The skill of application of THERMAL AGENTS (on models) :
  - i. Hot packs
  - ii. P.W.B.
  - iii. Whirlpool
  - iv. Contrast bath
  - v. Cryotherapy

#### **Practical: Basics of Computer**

Computer fundamental and internet lab

1. Using basic DOS commands.
2. Using external DOS commands
3. Creating a email account

4. Using web browser for searching and surfing.
5. Creating and formatting a document in MS office
6. Using autocorrect, auto text and spell check operation in MS office .
7. Create tables in MS Word.
8. Inserting different kinds of object in MS word.
9. Use main merge options in MS office.
10. Create a Excel work sheet with following options rows and columns alignment..
11. Using excel formulas.
12. Create a graph with available data in MS excel.
13. Create a PPT presentation using auto content wizard.
14. Use Clip art animation effects and word art galleries in presentations.
15. Using transition and setting timings for slide show.
16. Use MS access to create data base and tables.

## **109 CLINICAL TRAINING-I**

### **201 GENERAL PATHOLOGY**

#### **Unit I**

Introduction & History of pathology, Basic definitions and familiarization with the common terms used in pathology, Causes and mechanisms of cell injury, reversible and irreversible injury, Introduction of hyperplasia, hypoplasia, hypertrophy, atrophy, metaplasia, necrosis and apoptosis

#### **Unit II**

General features of acute and chronic inflammation: Vascular changes, cellular events, Cells and mediators of inflammation, Phagocytosis and its mechanism

#### **Unit III**

Tissue Renewal and Repair, healing and fibrosis, cirrhosis, introduction of oedema, hyperaemia, congestion, haemorrhage, haemostasis, thrombosis, embolism, infarction, shock and hypertension.

#### **Unit IV**

Protein energy malnutrition, deficiency diseases of vitamins and minerals, nutritional excess and imbalances. Role and effect of metals (Zinc, Iron and Calcium) and their deficiency diseases, Aetiology and pathophysiology of diabetes, arteriosclerosis, myocardial infarction, respiratory diseases (COPD), Parkinson disease

Infectious Diseases: pathogenesis & overview of modes of infections, prevention and control with suitable examples like Typhoid, Dengue

#### **Unit V**

Cancer: Definitions, nomenclature, characteristics of benign and malignant neoplasm, metastasis, Carcinogens and cancer, concept of oncogenes, tumour suppressor genes, DNA repair genes and cancers stem cells.

**Learning Outcome:** This curriculum will provide an introductory nature and build the concepts of how human system work in altered and diseased stage under the influence of various internal and external stimuli to the students.

### **202 GENERAL BIOCHEMISTRY**

#### **UNIT-I**

Nutrition: RDA, BMR, SDA, caloric requirement and balanced diet.

Carbohydrates: Definition, classification and general functions. Carbohydrate

Metabolism - Glycolysis, T.C.A cycle.

#### **UNIT-II**

Lipids: Definition, classifications and general functions. Essential fatty acids and their importance, Cholesterol, Lipoproteins. Metabolism-b-Oxidation of fatty acids, fatty liver and ketosis.

Amino Acids : Definition, classification, essential and non essential aminoacids.

#### **UNIT-III**



Proteins: Definition, classification, and Bio-medical Importance. Metabolism: Formation and fate of ammonia, Urea cycle and its significance. Study of hemoglobin and myoglobin with their functions.

#### UNIT-IV

Enzymes: Definition, classification with examples, Factors affecting enzyme action, isoenzyme and co-enzyme, Clinical importance of enzymes.

Biochemistry of connective tissue - Introduction, various connective tissue proteins : collagen, elastin- structure and associated disorders.

#### UNIT-V

Vitamins: Definition, classification and functions, dietary source, daily requirement and deficiency disorders.

Diabetes mellitus - definition, types & causes.

## 203 GENERAL PHARMACOLOGY

### Unit -I

#### GENERAL PHARMACOLOGY

• Definition & classification of drugs • Pharmacokinetics & pharmacodynamics • Broad categories of adverse reaction • Alcohols • Analgesics and antipyretics • Anti inflammatory drugs • Sedatives • Stimulants • Drug acting on muscle -Muscle relaxant, Muscle stimulant • Anti Parkinsonian agent • Drug modifying B P • Hypo lipidemia • Anti coagulants • Thyroxin and anti thyroid drugs • Anti diabetics • Glucocortics • Calcium, phosphorus, calcitonin, parathormone • Narrow spectrum antibiotics • Anti-cancer drugs • Disease modifying drugs

### Unit-II

#### DRUGS ACTING ON RESPIRATORY SYSTEM

• Respiratory stimulant • Respiratory depressants • Bronchodilators • Expectorants • Anti-asthmatic • Antitussive

### Unit -III

#### DRUGS ACTING ON CARDIOVASCULAR SYSTEM

• Anti-ischaemic drugs • Antiarrhythmic drugs • Drugs in heart failure • Anti-hypertensive drugs

### Unit-IV

#### VITAMINS

#### HORMONES

• Ovarian hormones • Anabolic steroids • Estrogen • Progesterone • Androgen

### Unit-V

#### LOCALLY ACTING DRUGS

• Local anesthetic drugs • Counter irritant • Rubefacient • Soothing agent • Anti microbial

#### DRUGS AND EXERCISE

#### DRUGS ACTING ON NERVOUS SYSTEM

• Antispasticity drugs

## 204 ENVIRONMENTAL SCIENCE

### Unit I

Definition and Scope of environmental studies, multidisciplinary nature of environmental studies, Concept of sustainability & sustainable development.

**Ecology and Environment:** Concept of an Ecosystem-its structure and functions, Energy Flow in an Ecosystem, Food Chain, Food Web, Ecological Pyramid & Ecological succession, Study of following ecosystems: Forest Ecosystem, Grass land Ecosystem & Aquatic Ecosystem & Desert Ecosystem.

**Unit II :Natural Resources:** Renewable & Non-Renewable resources; Land resources and land use change; Land degradation, Soil erosion & desertification. **Deforestation:** Causes & impacts due to mining, Dam building on forest biodiversity & tribal population. **Energy Resources:** Renewable & Non-

Renewable resources, Energy scenario & use of alternate energy sources, Case studies.

**Biodiversity:** Hot Spots of Biodiversity in India and World, Conservation, Importance and Factors Responsible for Loss of Biodiversity, Biogeographical Classification of India

**Unit III :Environmental Pollutions:** Types, Causes, Effects & control; Air, Water, soil & noise pollution, Nuclear hazards & human health risks, Solid waste Management; Control measures of urban & industrial wastes, pollution case studies

**Unit IV :Environmental policies & practices: Climate change & Global Warming** (Green house Effect),Ozone Layer -Its Depletion and Control Measures, Photochemical Smog, Acid Rain  
Environmental laws: Environment protection Act; air prevention & control of pollution act, Water Prevention & Control of Pollution Act, Wild Life Protection Act, Forest Conservation Acts, International Acts; Montreal & Kyoto Protocols & Convention on biological diversity, Nature reserves, tribal population & Rights & human wild life conflicts in Indian context

**Unit V :Human Communities & Environment:**

Human population growth;impacts on environment, human health & welfare, Resettlement & rehabilitation of projects affected person: A case study, Disaster Management; Earthquake, Floods & Droughts, Cyclones & Landslides, Environmental Movements; Chipko, Silent Valley, Vishnoi's of Rajasthan, Environmental Ethics; Role of Indian & other regions & culture in environmental conservation, Environmental communication & public awareness; Case studies.

## 205 EXERCISE THERAPY-I

UNIT-I

EXERCISE PHYSIOLOGY

• Exercise and physiology of body • Psychogenic aspect of exercise • Pharmacological aspect of exercise

MECHANICS

• Force • Gravity • Levers • Pulleys • Springs & Elasticity • Pendulum

UNIT-II

MUSCLE ACTION

• Group action of the muscles • Types of muscle contraction • Types of muscle works • Range of muscle work • Angle of pull • Mechanical efficiency of muscle

MUSCLE TESTING

• Different methods of testing-(like Manual muscle testing, Static muscle testing, Dynamic muscle testing) • Principles of Manual muscle testing • Merits &demerits of Manual muscle testing  
• Technique of Manual Muscle Testing of: Shoulder- flexors, extensors, adductors, abductors, internal and external rotators, Elbow-flexors, extensors, Wrist- flexors, extensors, Hip-flexors, extensors, adductors, abductors, internal rotators & external rotators, Knee - flexors, extensors, Ankle- dorsiflexors, plantar flexors.

UNIT-III

STARTING POSITION

• Definition • Fundamental position • Position and muscle work in Fundamental position • Effect and uses of fundamental positions

DERIVED POSITIONS

• Derived position of Standing, Sitting, Kneeling, Hanging & Lying  
• Position and muscle work of each derived positions • Effect and uses of each derived positions

PELVIC TILTS

• Definition • Types of pelvic tilts • Structures responsible for maintenance of pelvic tilt  
• Abnormal pelvic tilts • Measurements of pelvic tilts

UNIT-IV

GONIOMETRIC MEASUREMENT

• Introduction to joint range measurement  
• Different methods of testing-(like Inch tape measurement, Goniometric measurement)  
• Parts of goniometer • Types of goniometer • Principles & technique of Goniometric measurement  
• Merits & demerits of Goniometric measurement • Technique of Goniometric measurement of: Shoulder - flexion, extension, adduction, abduction, internal and external rotation, Elbow-flexion, extension, Wrist- flexion, extension, Hip-flexion, extension, adduction, abduction, internal rotation & external rotation, Knee- flexion extension, Ankle- dorsiflexion, plantar flexion, Hand - (M.C.P., P.I.P.,D.I.P. joints) • Subtalar joints

## MOVEMENTS

- Anatomical movements • Surface anatomy of the joints • Rhythm of movement • Timing of movement • Duration of the movement • Classification of movements-active/passive

## UNIT-V

### RELAXATION

- Definition of –muscle tone, contraction, relaxation • Technique of general relaxation
- Technique of local relaxation • Effects & uses of relaxation

### GAIT

- Definition of Gait • Phases and stages of normal Gait cycle • Parameters of Gait cycle
- Abnormal Gait cycle

### BED RIDDEN COMPLICATIONS

- Respiratory complications • Pressure sores • Postural Hypotension • Deep Venous Thrombosis
- Pulmonary embolism • Cardio vascular endurance

### OEDEMA

- Definition • Types • Treatment

### TRACTION

- Definition & Types • Technique of Traction • Effects & Uses of Traction • Indications • Contra-indications

## 206 ELECTROTHERAPY-I

### UNIT-I

#### ELECTRO PHYSIOLOGY

- Membrane physiology • Resting potential • Action potential • Propagation of action potential • Motor units • Synapse and synaptic transmission • Physiology of neuromuscular junction • Accommodation
- Physiology of pain-pathways • Modulation of pain-pain gate theory

#### INTRODUCTION TO –L F.

- Definition of L F • Principle of production of L F • Types of current used for neuro muscular stimulation

### UNIT-II

#### FARADIC CURRENT

- Definition and character • Modified faradic current, sinusoidal current • Parameters of faradic stimulation • Physiological effect of faradic current • Therapeutic effect of faradic current
- Indications and contraindications • Technique of motor point & group muscle stimulation
- Practice on: Faradic foot bath, Faradic under pressure, pelvic floor muscle reeducation
- Precautions

#### GALVANIC CURRENT

- Definition and character • Parameters of Galvanic stimulation • Physiological effect of Galvanic current • Therapeutic effect of Galvanic current • Indications and contraindications
- Technique of motor point & group muscle stimulation • Precautions

### UNIT-III

#### ELECTRO DIAGNOSIS

- Faradic Galvanic test • Strength Duration curve • Nerve conduction velocity • E M G

#### IONTOPHORESIS

- Definition • Principles of iontophoresis • Physiological and therapeutic effect of iontophoresis
- Principle of treatment • Contraindications and precautions

### UNIT-IV

#### T E N S

- Definition • Application of T E N S in different painful conditions • Effects and uses

#### I F T

- Definition • Principle of production • Application of T E N S in different painful conditions
- Effects and uses

### UNIT-V

#### FUNCTIONAL ELECTRICAL STIMULATION

## 207 BASIC NURSING AND FIRST AID

### UNIT-I

#### INTRODUCTION TO NURSING

Concept of Nursing and its principles ,Interpersonal relationships,

#### COMFORT MEASURES / NEEDS

Safety Measures ,Bed making ,Different positions: prone, lateral, recumbent, Flower's position, etc.

Bandaging: Basic turns, various methods and their application, applied to extremities

Aids in positioning ,Rest and sleep

### UNIT-II

#### LIFTING AND TRANSPORTING PATIENTS

Lifting patients up in the bed,Transfer techniques from bed to wheel chair, stretcher, floor/mat etc.

#### ELIMINATORY NEEDS

Giving and taking bed pan,Observation of urine, stools, sputum etc. Use and care of catheters, Enema giving

#### NUTRITIONAL NEEDS

Feeding methods ,Transfusion methods

### UNIT-III

#### CARE OF RUBBER GOODS

Simple aseptic techniques ,Sterilisation and disinfection

#### VITAL SIGNS

Various vital signs

#### INTRODUCTION TO FIRST AID

Definition ,Aims of first aid,Principles of first aid ,Golden rules of first aid,Qualities & tasks of first aider

First aid supplies & kit ,Concept of emergency

### UNIT-IV

#### HANDLING THE EMERGENCY

Identifying the hazards ,Triage & Action plan,Call for help

#### STEPS IN FIRST AID

Airway, Breathing, Circulation & Resuscitation,Call for medical assistance,Reassurance of the victim

Transportation

#### FIRST AID IN EMERGENCIES

Haemorrhage & Dressings ,Wounds & bleeding,Vertebral injuries,Burns, scalds,Fractures & dislocations, Joint & muscle injuries ,Head injuries ,Epilepsy,Poisoning, bites & stings,Hypothermia, heat stroke, frost bite

Foreign bodies in eye, ear, nose, throat ,First aid in Disasters

#### TRANSPORTATION OF THE VICTIM

Standard stretchers ,Various types of lifting & carrying,Ambulances

## 208 PRACTICAL-II

### Practical Pathology

1. Collection of blood and anticoagulants used..
2. Discussion about parts of microscope and different types of microscopes used in pathology.
3. Staining of slide by Leishman method.
4. Study of peripheral blood smear.
5. Estimation of hemaglobin by Sahli's method and discussion of other methods used.
6. ESR
7. Identification of various instruments in pathology lab & their uses (eg. Neubauer chamber, RBC, WBC, pipette etc.).
8. Bleeding Time, Clotting Time

### Practical Biochemistry

1. To identify carbohydrates in given solution by various methods.
2. To determine protein by Biuret method.
3. To perform protein test by various methods.
4. Physical examination of urine
5. Urine sugar determination by Benedict's method.
6. Protein by heat and acetic method
7. Bile salt, Bile pigments and Urobilinogen determination
8. Determination of Ketone bodies

#### **PRACTICAL EXERCISE THERAPY-I**

1. Starting positions and derived positions
2. Range of motion (PROM, AROM, AAROM) exercises to all joints
3. Measurement of joint range using goniometer
4. General and local Relaxation techniques
5. Suspension exercise to all major joints
6. Massage – upper limb, lower limb, back, face
7. Manual muscle testing of individual muscles
8. Coordination exercises, balancing exercises

#### **PRACTICAL ELECTROTHERAPY-I**

1. Identify basic electrical components in electrotherapeutic equipments.
2. Reading of medical records, identifying indications and contraindications for electrotherapy.
3. Stimulation of motor points, stimulation of individual muscle and group muscle
4. Faradic foot bath, Faradism under pressure.
5. Plotting SD graph, diagnosis using electro diagnostic test – FG test and SD curve.
6. Placement of electrodes in TENS & IFT with dosimeter for various indications.

### **209 CLINICAL TRAINING**

#### **301 GENERAL MEDICINE**

##### **UNIT-I**

##### **INFECTIONS**

Mode of spread and preventive measures of the following diseases:

Bacteria - Tetanus, Viral - Herpes simplex, Herpes Zoster, Varicella, Measles, Hepatitis B, AIDS.

Protozoal - Filaria

##### **HAEMATOLOGY**

Clinical aspect of Anemia: iron deficiency, B12 & Folic acid deficiencies

Types of bleeding diathesis, Clinical features and management of Haemophilia

##### **UNIT-II**

##### **RESPIRATORY TRACT**

Definition, aetiology, clinical features, prevention and management of:

Chronic Bronchitis, Pneumonia, Asthma, Emphysema, Pulmonary Tuberculosis, Bronchiectasis

Chest wall deformities, Occupational lung diseases

##### **CARDIO-VASCULAR SYSTEM**

Definition, aetiology, clinical features & management of:

Cardiac failure, Rheumatic fever, Infective endocarditis, Ischaemic heart disease, Hypertension

Pulmonary embolism & Pulmonary infarct, Deep vein thrombosis, Congenital heart disease – ASD, VSD,

Fallot's tetralogy, PDA

##### **UNIT-III**

##### **BONE, JOINT, CONNECTIVE TISSUE DISORDERS**

Introduction to autoimmune disease, Systemic lupus erythematosus, Polymyositis, Dermatomyositis,

Polyarthritis nodosa, Scleroderma, Rheumatoid arthritis, Osteoarthritis

##### **RENAL DISEASES**

Acute & Chronic Renal Failure ,Urinary tract infections

#### METABOLIC & ENDOCRINE DISEASES

Definition, aetiology, types, complications & management of:

Diabetes mellitus ,Diseases of thyroid & parathyroid, adrenal and pituitary glands. Obesity

#### UNIT-IV

#### GASTROINTESTINAL DISEASES

Infection of mouth and throat,Oesophageal spasm ,Acid peptic disorder of stomach, Liver and gall bladder disorder ,Pancreatic disorder ,Colon disorder, Abdominal hernia

#### GERIATRICS

Hypertension ,Ischaemic heart diseases, Cerebro vascular accident, Benign prostate hyperplasia

Cataract and other causes of vision failure

#### UNIT-V

#### DERMATOLOGY

Common skin infection ,Psoriasis,Leprosy, Venereal diseases

#### MISCELLANEOUS

Allergy ,Drug reaction

#### GENETICS AND DISEASES

Common inherited disorders

Prevention of genetic disorders

### **302 GENERAL SURGERY**

#### UNIT-I

Fluid, Electrolyte and Acid-Base disturbances –

Diagnosis and management ; Nutrition in the surgical patient., Shock - Clinical feature, pathology & management.

Transfusion therapy in surgery – blood components, complications of transfusion .

Wounds :

a) Classification, acute wounds, chronic wounds.

b) Wound healing – Basic process involved in wound repair, basic phases in the healing process, clinical management of wounds, factors affecting wound healing, scars - type and treatment.

c) Wound Infections, - physiology & manifestation, types of infections, treatment, principle of antimicrobial treatment.

Pre & postoperative complications of surgery and their management.

#### UNIT-II

Hemostasis –

Components, hemostatic disorders, factors affecting bleeding during surgery.

Types of anaesthesia and its affects on the patient, pain relief.

Types of Incisions ; Clips Ligatures and Sutures; General Thoracic Procedures,

Radiologic Diagnostic procedures, Endoscopy–types, Biopsy – uses and types.

Overview and Drainage systems and tubes used in Surgery.

Burn:

Definition, Classification, Causes, Prevention, Pathological changes,

Complications, Clinical Features and Management.

#### UNIT-III

Skin Grafts :

Types, Grafting Procedures, Survival of Skin Graft ; Flaps – Types and uses of Flaps.

Infections and injuries of Hand :

Hand infection, suppurative infection, other infection, hand injuries, dupuytren's contracture.

Surgical Oncology – Cancer –

Definition, types, clinical manifestations of cancer, Staging of Cancer, surgical procedures involved in the management of cancer.

Disorders of muscles, tendons and ligaments, sports related injuries. Periarticular

inflammations, acute muscle injury, chronic muscle injury, Tendon disorders, tendon sheath disorder, fascia, Ganglia, Bursae, Repetitive strain injury.

#### UNIT-IV

Neurological disorder affecting the musculo-skeletal system, Motor dysfunction and treatment, cerebral palsy, acquired abnormalities, inherited disorder, neuromuscular disorder, sensory disorder.

The cranium :

The scalp, the skull, head injuries.

Thoracic and cardiac surgery :

Thoracotomy, lobectomy, pneumonectomy, thoracoplasty, mitral valvotomy, open heart surgery. Various surgical heart diseases with respect to clinical presentation, complications and management - Valvular heart disease, congenital heart disease -e.g., ASD, VSD, PDA, Ischaemic heart disease. Outline of postoperative complications in cardiac surgery and their management.

### **303 THERAPEUTIC MASSAGE**

#### UNIT-I

##### INTRODUCTION TO MASSAGE

Definition, History of massage

##### CLASSIFICATION OF MASSAGE

On the basis of character of moment, On the basis of depth of the tissues approached

On the basis of region massaged, On the basis of means of administration of technique

#### UNIT-II

##### PHYSIOLOGICAL EFFECTS OF MASSAGE ON THE SYSTEM

On Circulatory system, On Metabolism, On Nervous system, On Mobility of soft tissues, On Respiratory system

On Skin, On Adipose tissue, Psychological effect

##### THERAPEUTIC USES OF MASSAGE

#### UNIT-III

##### TECHNIQUE OF MASSAGE

Stroking-superficial & deep, Pressure manipulations: Kneading (palmar, digital, reinforced), Petrissage (picking up, skin rolling, wringing), Tapotement (clapping, hacking, tapping, beating, pounding), Friction (transverse, circular), Shaking (shaking & vibration)

##### PHYSIOLOGICAL EFFECT OF

Stroking, Pressure manipulation, Tapotement, Friction, Shaking

#### UNIT-IV

##### THERAPEUTIC EFFECT OF

Stroking, Pressure manipulation, Tapotement, Friction, Shaking

##### CONTRA INDICATIONS FOR

Stroking, Pressure manipulation, Tapotement, Friction, Shaking

#### UNIT-V

##### PRACTICAL ASPECT OF MASSAGE

Positioning of patient, Draping, Stance of the therapist, Attitude and approach of the therapist, Contact and continuity of the therapy, Lubricant, Accessories

##### SEQUENCE OF MASSAGE FOR

Upper limb, Lower limb, Back, Neck, Face

##### THERAPEUTIC APPLICATION OF MASSAGE

### **304 ORTHOPAEDICS**

#### UNIT-I

Introduction to Orthopaedics:

An Orthopaedic patient, history taking, clinical features, clinical examination, and

investigation (X-ray, CT scans, MRI scan, Bone scan), Injuries of muscle & tendons : etiology & management.

Bony & Soft tissue injuries :

Injury & repair, Clinical presentation, evaluation & general principles of rehabilitation management, Tenosynovitis, Bursitis etc.

Fractures -

a. Types, Healing, complications, general principles of treatment. b. Fracture of Spine, pelvis, hip joint, femur, patella, knee joint, cartilage and ligaments, tibia, fibula, ankle, calcaneum, metatarsals, calcicle, scapula, ribs, humerus, elbow joint, radius, ulna, scaphoid, metacarpals & phalanges. c. Fracture separation of epiphysis.

UNIT-II

Inflammation of bones & joints (Clinical features, evaluation, conservative & surgical management) -a) Bones - Osteomyelitis- osteomyelitis - pyogenic & tubercular, osteoarthritis.

b) Joints - Rheumatoid arthritis, Juvenile Arthritis, Reiter's disease, Polymyalgia, rheumatica, Gout, Ankylosing spondylitis, Neuropathic- joints, haemophilic ,arthropathy, Avascular necrosis.

Nutritional & metabolic diseases of bones :

Rickets, Osteomalacia & Osteoporosis.

Spine deformities:

Clinical features, diagnosis, management of Scoliosis, Kyphosis, Lordosis, Spondylosis, prolapse of intervertebral disc, cord compression, sacralization and traumatic deformities (paraplegia & quadriplegia).

UNIT-III

Infections of Musculoskeletal system -

a. Bacterial infections

b. Tubercular infections, Leprosy, Pott's paraplegia

Congenital malformations (in brief description with outline of treatment):

a. Congenital Hip Displasia, Congenital Talipes Equinovarus / Calcaneoalgus, Arthrogryposis Multiplex Congenita, Congenital Torticollis, Acromelia, phocomelia, Amelia,

b. Spina Bifida: all types, clinical presentation, sequel & management

Developmental diseases of skeleton:

Osteogenesis imperfecta, heterotopic ossification, Osteochondritis, Perthes' disease.

UNIT-IV

Neuromuscular diseases:

a) Volkmann's Ischaemic contracture, obstetrical paralysis, and peroneal muscular atrophy

b) Poliomyelitis – orthopaedic aspects and treatment of deformities.

Upper Limbs:

Clinical presentation, evaluation, conservative & surgical management of rotator cuff injuries, adhesive capsulitis, bursitis, biceps tendonitis, shoulder dislocation, snapping & winged scapula, tennis and golfer elbow, olecranon bursitis, soft tissue injuries, sprains and strains, Arthritic conditions, tenosynovitis, Carpal tunnel syndrome, wrist drop, claw hand, mallet finger, Dupuytren's contracture, reflex sympathetic dystrophy, common fractures and dislocations.

Lower Limb:

Clinical presentation, evaluation, conservative & surgical management of Arthritic conditions, soft tissue injuries, sprains and strains, achillis tendonitis, bursitis, plantar fasciitis, deformities, reflex sympathetic dystrophy, neuropathic Joints, common fractures and dislocations, prescavus, pesavaglus, hallus valgus footstrains, metatarasalgia, hallus rigidus, ingrowing toe nail.

UNIT-V

Neuro-vascular Diseases :

Orthopaedic aspects and treatment of - Nerve injuries (major nerves), Plexus injuries

Amputations :

Justification, outline of surgical approaches, incisions, procedures, indications, contraindications, complications & management.



Bone tumors : benign & malignant (in brief)

Operations :

Reconstructive arthroplasty, arthodesis, bone grafting, osteotomy, tendon transplantation & transfer, nerve- neurolysis, suture, graft and decompression.

Orthopaedic splints and appliances.

Tractions : Skin, skeleton (in brief).

Foot arches & their complications.

Rehabilitation of patients.

### 305 EXERCISE THEORY-I

#### UNIT-I

Joint mobilization:

Definition – Mobilization, Manipulation, indications, limitations, contraindications and precautions, applications of Mobilization technique to various joints.

Principles of Maitland, Mulligan and Meckzi joint Manipulation techniques.

Stretching:

Definition, properties of soft tissue, mechanical and neurophysiological properties of connective tissue, mechanical properties of non contractile tissue. Determinants, type and effect of stretching, precautions, general applications of stretching technique.

Resisted exercise:

Definition – strength, power, endurance. Guiding principle of resisted exercise, determinants, types Manual and Mechanical Resistance Exercise, Isometric Exercise, Dynamic Exercise - Concentric and Eccentric, Dynamic Exercise - Constant and Variable Resistance, Isokinetic Exercise, Open-Chain and Closed-Chain Exercise, precautions, contraindications

Progressive Resistance Exercise— de Lormes, Oxford, MacQueen, Circuit Weight Training, Plyometric Training—Stretch-Shortening Drills, Isokinetic Regimens

#### UNIT-II

Proprioceptive Neuromuscular Facilitation – Principles, Diagonal patterns of movements, Basic procedures, Upper Extremity Diagonal patterns, Lower Extremity Diagonal Patterns. Technique in PNF – Rhythmic Initiation, Repeated Contractions, Reversal of Antagonists, Alternating Isometrics, Rhythmic Stabilization.

Aerobic Exercises – Definitions, Physiological response to Aerobic Exercise, Evaluation of aerobic capacity – exercise testing, Determinant of Aerobic Exercise, Physiological Changes with Aerobic Training, Aerobic Exercise Program, Applications of Aerobic Program in patients with chronic illness.

Hydrotherapy:

Definitions, Goals and Indications, Precautions and Contraindications, Properties of water, Therapeutic Exercises in Hydrotherapy, Special equipments used.

#### UNIT-III

Balance training:

Definition and Key terms, Balance control, Components of balance, Balance Impairment, Examination of Impaired Balance, Balance training Exercises.

Posture:

Normal Postural Control, Postural Alignment, Postural Stability, Postural Impairment and Mal-Alignment, Postural Training.

Breathing Exercises:

Aims and Goals of Breathing Exercises, Procedures of Diaphragmatic Breathing, Segmental Breathing, Pursed-Lip Breathing, Preventing and Relieving Episodes of Dyspnea, Positive Expiratory Pressure Breathing, Respiratory Resistance Training, Glossopharyngeal Breathing.

Exercises to mobilize the chest, Postural Drainage, Manual Technique used in Postural Drainage, Postural Drainage Positions, Modified Postural Drainage.

UNIT-IV

Gait Training:

Definition, Different methods of Gait Training, Gait Training in Parallel Bars,

Walking Aids: Types: Crutches, Canes, Frames; Principles and training with walking aids.

Soft Tissue Injury:

General Description of Inflammation and repair, Acute, Sub Acute, and Chronic stage, General Treatment Guidelines.

Yoga: History, Introduction, Classification, Various Asana

### **306 ELECTROTHERAPY-II**

UNIT-I

Introduction to high frequency current, Electro Magnetic Spectrum

SWD: Define short wave, Frequency & Wavelength of SWD, Principle of Production of SWD, Circuit diagram & Production of SWD, Methods of Heat Production by SWD treatment, Types of SWD Electrode, Placement & Spacing of Electrodes, Tuning, Testing of SWD Apparatus, Physiological & Therapeutic effects, Indications & Contraindications, Dangers, Dosage parameters. Pulsed Electro Magnetic Energy

Micro Wave Diathermy: Define Microwave, Wave length & Frequency, Production of MW, Applicators, Dosage Parameters, Physiological & Therapeutic effects, Indications & Contraindications, Dangers of MWD.

UNIT-II

Ultrasound: Define Ultrasound, Frequency, Piezo Electric effects: Direct, Reverse, Production of US, Treatment Dosage parameters: Continuous & Pulsed mode, Intensity, US Fields: Near field, Far field, Half value distance, Attenuation, Coupling Media, Thermal effects, Nonthermal effects, Principles & Application of US: Direct contact,

Water bag, Water bath, Solid sterile gel pack method for wound. Uses of US, Indications & Contraindications, Dangers of Ultrasound. Phonophoresis: Define Phonophoresis, Methods of application, Commonly used drugs, Uses. Dosages of US.

IRR: Define IRR, wavelength & parameters, Types of IR generators, Production of IR, Physiological & Therapeutic effects, Duration & frequency of treatment, Indication & Contraindication.

UNIT-III

UVR: Define UVR, Types of UVR, UVR generators: High pressure mercury vapour lamp, Water cooled mercury vapour lamp, Kromayer lamp, Fluorescent tube, Theraktin tunnel PUVA apparatus. Physiological & Therapeutic effects. Sensitizers & Filters. Test dosage calculation. Calculation of E1, E2, E3, E4 doses. Indications, contraindications. Dangers Dosages for different therapeutic effects, Distance in UVR lamp.

LASER: Define LASER. Types of LASER. Principles of Production. Production of LASER by various methods. Methods of application of LASER. Dosage of LASER. Physiological & Therapeutic effects of LASER. Safety precautions of LASER. Classifications of LASER Energy density & power density.

UNIT-IV

Wax Therapy: Principle of Wax Therapy application – latent Heat, Composition of Wax Bath Therapy unit, Methods of application of Wax, Physiological & Therapeutic effects, Indications & Contraindication, Dangers.

Contrast Bath: Methods of application, Therapeutic uses, Indications & Contraindications.

Moist Heat Therapy: Hydro collator packs – in brief, Methods of applications, Therapeutic uses, Indications & Contraindications.

UNIT-V

Fluidotherapy: Construction, Method of application, Therapeutic uses, Indications & Contraindications.

Cryotherapy: Define- Cryotherapy, Principle- Latent heat of fusion, Physiological & Therapeutics effects, Techniques of Applications, Indications & Contraindications, Dangers, and Methods of application with dosage.

EMG and Nerve Conduction Velocity test, Biofeed back

### **307 BIOMECHANICS**

UNIT-I

Mechanics - Definition of mechanics and Biomechanics

Motion: definition, types of motion, plane and axis of motion, factor determining the kind and modification of motion.

Force - Definition, diagrammatic representation of force, point of application, classification of forces, concurrent, coplanar and co-linear forces, composition and resolution of forces, angle of pulls of muscle

UNIT-II

Friction

Gravity - Definition, line of gravity, Centre of gravity

Equilibrium - Supporting base, types, and equilibrium in static and dynamic state

Lever - Definition, function, classification and application of levers in physiotherapy & order of levers with example of lever in human body

UNIT-III

Pulleys - system of pulleys, types and application

Elasticity - Definition, stress, strain, HOOKE'S Law

Springs - properties of springs, springs in series and parallel, elastic materials in use Muscular system

Definition, properties of muscle, muscular contraction, structural classification, action of muscle in moving bone, direction of pull, angle of pull, functional classification, coordination of muscular system.

UNIT-IV

Joint structures and functions:

i. Joint design, Structure of Connective Tissue, Properties of Connective Tissue, joint function, changes with disease, injury, immobilization, exercise, over use

ii. Structure and functions of upper extremity joints – shoulder complex, elbow complex, wrist and hand complex

iii. Structure and functions of lower extremity joints – hip joint, knee joint, ankle and foot complex

iv. Structure and functions of axial skeletal joints – vertebral column – craniocervical, thorax, lumbar, lumbo pelvic region

v. Structure and functions of temporomandibular joint

Posture – dynamic and static posture, kinetic and kinematics of posture, analysis of posture, effect of age, pregnancy, occupation on posture.

Gait – kinematics and kinetics of gait, gait in running and stair climbing.

### **308 PRACTICAL-III**

#### **PRACTICAL BIOMECHANICS**

1. Goniometry – measurement of joint ROM

2. Identify Muscle work of various movements in body at different angle.

3. Identify normal and abnormal posture.

4. Normal gait with its parameters and identify abnormal gait with the problems in it.

**PRACTICAL EXERCISE THERAPY-II**

1. Joint Mobilisation to individual joint
2. Stretching of individual and group muscles
3. Resisted exercises to individual and group muscles, open and closed kinematic exercises
4. PNF patterns to upper and lower limb.
5. Various types breathing exercises, chest mobilization exercises, postural drainage
6. Gait training with various walking aids

**PRACTICAL ELECTROTHERAPY-II**

The student of Electrotherapy must be able to demonstrate the use of electrotherapy modalities applying the principles of electrotherapy with proper techniques, choice of dosage parameters and safety precautions.

1. Application of Ultrasound for different regions-various methods of application
2. Demonstrate treatment techniques using SWD, IRR and Microwave diathermy
3. Demonstrate the technique of UVR exposure for various conditions – calculation of test dose
4. Calculation of dosage and technique of application of LASER
5. Technique of treatment and application of Hydrocollator packs, cryotherapy, contrast bath, wax therapy

309 CLINICAL TRAINING-III