

BACHELOR OF PHYSIO THERAPY (B.P.T)

Course Duration 4½ Years



Affiliated By

The West Bengal University of Health Sciences

DD-36, Sector-1, Salt Lake,

Kolkata-700064

(To Be Effective From Academic Session 2023-2024)

BPT-1st YEAR

Sr.	Subject	Theory			Practical			Grand Total
		Marks	IA	Total	Marks	IA	Total	
1.	Anatomy	80	20	100	80	20	100	200
2.	Physiology	80	20	100	80	20	100	200
3.	Biochemistry	40	10	50	-	-	-	50
4.	Electrotherapy-I	80	20	100	80	20	100	200
5.	Exercise therapy -I	80	20	100	80	20	100	200
6.	Health Care Delivery system Including & English Communication Skill	40 (25+15)	10	50	-	-	-	50
7.	Computer Application	-	-	-	40	10	50	50
TOTAL		400	100	500	360	90	450	1000

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BPT-2nd YEAR

Sr.	Subject	Theory			Practical			Grand Total
		Marks	IA	Total	Marks	IA	Total	
1.	a) Pathology, b) Microbiology & c) Pharmacology	80 (30+25+25)	20 a=10, b=5 c=5	100	-	-	-	100 (40+ 30+ 30)
2.	Electrotherapy-II	80	20	100	80	20	100	200
3.	Exercise therapy -II	80	20	100	80	20	100	200
4.	Psychology & Sociology	80 (40+40)	20 (10+10)	100	-	-	-	100
5.	Biomechanics & Kinesiology	80	20	100	40	10	50	150

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BPT-3rd YEAR

Sr.	Subject	Theory	I.A	Total	Practical	I.A	Total	Grand Total
1.	Orthopaedics	80	20	100	40	10	50	150
2.	General Medicine	80	20	100	40	10	50	150
3.	General Surgery	80	20	100	80	20	100	200
4.	Neurology & Neurosurgery	80	20	100	80	20	100	200
5.	Physical/ Functional Assessment & Management	80	20	100	80	20	100	200
6.	Research Methodology & Biostatistics	40 (20+20)	10	50	-	-	-	50

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BPT- 4th YEAR

Sr	Subject	Theory	I.A.	Total	Practical	I.A.	Total	Grand Total
1	Physiotherapy in Orthopedics & Sports	80 (60+20)	20	100	80	20	100	200
2	P.T in Surgery Including Gynecology and Obstetrics	80	20	100	80	20	100	200
3	Physiotherapy in Medical Condition Including Cardiopulmonary And Pediatrics	80	20	100	80	20	100	200
4	P.T in Neurology & Neurosurgery	80	20	100	80	20	100	200
5	Physiotherapy Ethics, Administration & Principles of rehabilitation	80	20	100	80	20	100	200

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| 1. Peripheral Nerves | 2. Neuromuscular Junction |
| 3. Sensory End Organs | 4. Spinal Cord Segments & Areas. |
| 5. Brainstem | 6. Cerebellum |
| 7. Inferior colliculi | 8. Superior Colliculi |
| 9. Diencephalon | 10. Hypothalamus |
| 11. Epithalamus | 12. Thalamus |
| 13. Cerebral hemispheres | 14. Corpus striatum |
| 15. Rhinencephalon | 16. Lateral Ventricles |
| 17. Meninges | 18. Blood supply of the brain |
| 19. Internal Capsule | 20. Visual radiation |
| 21. Auditory radiation | 22. Thalamocortical radiations |
| 23. Pyramidal systems | 24. Extra - pyramidal systems |
| 25. Anatomic integration | 26. Intra - cortical integration |
| 27. Sympathetic system | 28. Para-sympathetic system |
| 29. Cranial nerves | |

Section – IV Musculo Skeletal System 40 Hrs

(A) Myology:

1. The fascia and muscles of upper limb.
2. The fascia and muscles of lower limb.
3. The fascia and muscles of trunk.
4. The fascia and muscles of head, neck and face.
5. Muscles of eye.

(B) Osteology & Arthrology:

1. General structure and classification of all bones of skeleton and their attachments.
2. Classification of joints.
3. Movements of Joints.
4. Factors permitting and limiting movements of joints.
5. Joints of Upper Limb.
6. Joints of Lower Limb.
7. Shoulder girdle
8. Pelvic Girdle
9. Joints of Head & Neck and T.M Joints.

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10. Joints of Trunk.

7. Section – V Surface & Radiological Anatomy: 15 Hrs Surface Anatomy of the body.
Radiographic appearance of Musculo skeletal system of Upper limb, Lower-limb & Spine.

Anatomy Practical

1. Surface Anatomy: To study, identify and mark the surface land marks on human Body.
2. To study the muscles of trunk, lower and upper extremities and face on a dissected human body.
3. To study the Bones of Human Body with special emphasis on origin and insertion of muscles & ligaments.
4. To study the anatomy of joints of upper and lower extremities and vertebral column on a dissected human body.
5. To study the anatomy of C.N.S. and P.N.S. on a dissected human body.
6. To study the gross anatomy of Respiratory, Digestive, Endocrine, Urinary and Genital system on a dissected human body.

Books Suggested:

1. Inderbir Singh, Textbook of Anatomy with colour Atlas - Vol.1,2,3. Jaypee Brothers.
2. B.D.Chaurasia, Human Anatomy - Volume 1,2,3, CBS Publishers & Distributors.
3. Meminn's Last's Anatomy - Regional and applied, Churchill Livingstone.
4. Meminn, et al- A Colour Atlas of Human Anatomy, Mosby.
5. Cunningham Manual of Practical Anatomy Vol. I,II,III, Churchill. Livingstone....
6. Inderbir Singh, A Textbook on Human Neuro Anatomy, Jaypee Brothers.
7. Snell - Clinical Anatomy - Lippincott.
8. Williams & Warwick, Gray's Anatomy - Churchill Livingstone.

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Paper – II
PHYSIOLOGY

Time: 3 Hrs.

Theory: 80+ 20 Int. Assess. =100

Practical: 80+ 20 Int. Assess = 100

Teaching hours: Theory = 120, Practical = 100

Section – I General Introduction: 20 Hrs

1. Cell Introduction: Outline of basic concepts of cell structure, functions of components and transport across membranes.
2. Skin: Functions, blood of flow and temperature regulation.
3. Blood and Lymph: Cell renewal system, haemoglobin, erythrocyte granulocyte, lymphocyte, coagulation, regulation of hydrogen within concentration of body fluids, fluid distribution and exchange.

Section – II Physiology of the system of the body: 45 Hrs

1. Digestion: Control of food and water intake and secretion and absorption movements of the alimentary canal.
2. Circulation: Cardio-vascular system, mechanical and electro-physiological activity of the heart, regulation of heart, coronary circulation, haemodynamics, circulation through brain, skin and skeletal muscle.
3. Excretion: Renal functions including formation of Urine & Micturition.
4. Respiration: Respiratory gases, pulmonary gas exchange, control and mechanics of breathing, hypoxia, asphyxia, dyspnoea, oxygen therapy and resuscitation.
5. Endocrine System: Outline of various hormones and their actions, pituitary gland, thyroid, parathyroid, adrenal glands & Gonads.
6. General Metabolism: Carbohydrate, Protein & Fat Metabolism.

Section – III Neuro – Physiology: 20 Hrs

1. Neuron: Properties and functions.
2. Action Potential.
3. Special properties of nerve trunks and tracts.
4. Motor units.
5. Reflex physiology.
6. Synapse and synaptic transmission.
7. Supraspinal control.
8. Cerebellum and basal ganglia.
9. Autonomic nervous system
10. Somatic sensation.
11. Pain
12. Taste, Olfaction, Auditory and Vision
13. Neuro Physiological Psychology

Section – IV Muscle Physiology: 15 Hrs

1. Structure and function of Muscle tissue - skeletal and cardiac
2. Chemical processes involved in muscle contraction.

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3. Physiology of muscle contraction.

Section – V Physiology of exercise and work: 20 Hrs

1. Neuromuscular activity, human movement, physiological mechanism in movement behaviour, strength, endurance, analysis of movement.
2. Circulatory and respiratory response to exercise including effects on the heart blood circulation body fluid changes, pulmonary -ventilation, gas exchange and transport, etc.
3. Effects of exercise and work on other body functions.
4. Metabolic and environmental aspects of exercise and work - metabolism, energy requirement, efficiency of muscular work, nutritional aspects, heat and body temperature regulation & environmental factors.
5. Effects of Exercise training - endurance, fatigue and recovery.
6. Fitness and health - age sex, body type, race, stress and medical aspects of exercise.

PHYSIOLOGY PRACTICAL

To study the following physiological Phenomena:

Identification of blood cells and different counts.

1. W.B.C. Count.
2. R.B.C. Count.
3. Haemoglobin percentage and color index.
4. E.S.R. and Blood groups.
5. Bleeding time and clotting time.
6. Respiratory efficiency tests.
7. Artificial respiration and C.P.R.
8. Pulse rate, heart rate and measurement of Blood Pressure.
9. Respiratory rate and Auscultation.
10. Normal E.C.G.
11. Reflexes - Superficial Deep.
12. Sensations.
13. Tests for functions of Cerebrum.

Tests for functions of Cerebellum

Books Suggested:

1. Textbook of Medical Physiology - Arthur Guyton (Mosby.)
2. Text book of Physiology - Anand & Manchanda, Tata McGraw Hill.
3. Human Physiology - Vol. I & 2, Chatterjee, CC, Calcutta, Medical Allied.
4. Concise Medical Physiology- Chaudhari, S.K., New Central Agency, Calcutta.
5. Principles of Anatomy and Physiology- Tortora & Grabowski – Harper Collins.
6. Textbook of Practical Physiology - Gai- Jaypee

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Paper – III **BIOCHEMISTRY**

Time: 3 Hrs.

Theory: 40+ 10 Int. Assess.=Total 50

Teaching hours: Theory = 50

1. Biophysics: Concepts of pH and buffers, acid base equilibrium osmotic pressure and its physiological applications. **2 Hrs**
2. Cell: Morphology, structure & functions of cell, cell membrane, Nucleus, chromatin, Mitochondria, Endoplasmic Reticulum, Ribosomes. **2 Hrs**
3. Carbohydrates: Definition, functions, sources, classifications, Monosaccharides, Disaccharides, Polysaccharides, mucopolysaccharide and its importance. **2 Hrs**
4. Lipids: Definition, function, sources, classification, simple lipid, compound lipid, derived lipid, unsaturated and saturated fatty acid. Essential fatty acids and their importance, Blood lipids and their implications, cholesterol and its importance. **2 Hrs**
5. Proteins Definition, sources, classification, simple protein conjugated protein, derived proteins and its, properties. **2 Hrs**
6. Nucleic acid: Structure and function of DNA and RNA, Nucleosides, nucleotides, Genetic code, biologically important nucleotides. **3 Hrs**
7. Enzymes: Definitions, classification, mode of action, factor affecting enzyme action, clinical importance of enzyme. **2 Hrs**
8. Vitamins: Classification, fat soluble vitamins, A,D,E & K, water soluble vit. B complex & C, Daily Requirements, Physiological functions and diseases of Vitamin deficiency. **3 Hrs**
9. Bioenergetics: Concept of free energy charge, Exergenic and endogenic reaction, concepts regarding energy rich compounds, Respiratory chain and Biological oxidation. **3 Hrs**
10. Carbohydrate Metabolism: Glycolysis, HMP shunt pathway, TCA cycle, glycongenesis, Glucongenesis, Maintenance of Blood Glucose. **4 Hrs**
11. Lipid Metabolism: Fatty acid oxidation, Fatty acid synthesis, Metabolism of Cholesterol, Ketone bodies, Atherosclerosis and obesity. **4 Hrs**
12. Protein Metabolism: Transamination, Transmethylation, Deamination, Fate of ammonia, urea synthesis and synthesis of creatine, inborn errors of metabolism. **4 Hrs**
13. Water and Electrolyte Fluid compartment, daily intake and output sodium and potassium metabolism. **3 Hrs**
14. Nutrition: Balance, diet metabolism in exercise and injury, Diet for Chronically ill and terminally ill patients. **5 Hrs**
15. Connective tissue: Mucopolysaccharide connective tissxue proteins, glycoprotein, chemistry and Metabolism of bone. **2 Hrs**
16. Nerve tissue: Composition, metabolism, chemical mediators of Nerve activity. **2 Hrs**
17. Hormones: General characteristics and mechanism of Hormone action insulin, glucagone Thyroid and Parathyroid hormones, cortical & sex hormones. **3 Hrs**
18. Isotopes: Isotopes and their role in treatment and diagnosis of diseases. **2 Hrs**

Books Suggested:

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1. Medical Biochemistry for Physiotherapy students- Harpreet Kaur-- Jaypee Brothers.
2. Textbook of Biochemistry - Chatterjee M.N. - Jaypee Brothers.
3. Textbook of Biochemistry for Medical Students - Vasudevan D.M. - Jaypee Brothers.
4. Clinical Biochemistry - Metabolic & Clinical aspects - Marshall & Bangert Churchill Livingstone.
5. Biochemistry by Southerland - Churchill Livingstone

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BPT Syllabus

Detailed Syllabus B.P.T 1st Year

Paper -IV EXERCISE THERAPY - I

Time: 3 Hrs.

Theory: 80+ 20 Int. Assess. =100

Practical: 80+ 20 Int. Assess = 100

Teaching hours: Theory = 100, Practical = 100

COURSE DESCRIPTION: The module is intended to provide the student understanding the basics of movement. The students will be taught about different exercise therapy instruments which use to assess the patients as well as to give treatment.

COURSE OBJECTIVES: At the end of the course, the student should be able to demonstrate:

- Various basic of exercise therapy evaluation format in Physiotherapy treatment methods on simulated patients in the labs
- The basic physics behind the movement

TEXTBOOK / REFERENCE BOOKS:

1. Practical Exercise Therapy - Hollis - Blackwell Scientific Publications.
2. Therapeutic Exercise - Basmajian - Williams and Wilkins.
3. Therapeutic Exercises Foundations and Techniques - Kisner and Colby. F.A. Davis.
4. Principle of Exercise Therapy - Gardiner - C.B.S. Delhi.
5. Beard's Massage - Wood - W.B. Saunders.
6. Therapeutic Massage- Holey and Cook- W.B. Saunders.
7. Muscle testing and functions - Kendall - Williams & Wilkins.
8. Daniels and Worthingham's - Muscle testing - Hislop & Montgomery - W.B. Saunder.
9. Measurement of Joint Motion: A Guide to Goniometry - Norkins& White F.A. Davis.

Section-I

40 Hrs

1. Introduction to Exercise therapy, Principles, techniques and general areas of its application, Assessment & its importance.
2. Description of Fundamental starting positions and Derived positions including joint positions, muscle work, stability, effects and uses.
3. Introduction to Movements including analysis of joint motion and muscle work.
4. Classification of movements - Describe the types, technique of application, indications, contraindications, effects and uses of the following:
 - a) Active movement
 - b) Passive movement
 - c) Active assisted movement
 - d) Resisted movement
5. To study the principles, techniques of application, indications, precautions, effects and uses of Suspension Therapy.

Section - II

Manual Muscle Testing

15 Hrs

- a) Principles and application techniques of Manual muscle testing.
- b) Testing position, procedure and grading of muscles of the upper limb, lower limb and trunk etc.

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Section – III**Goniometry****15 Hrs**

Goniometer and its types

- a) Principles, techniques and application of Goniometry.
- b) Testing position, procedure and measurement of R.O.M. of the joints of upper limbs, lower limbs and trunk.

Section - IV Soft Tissue Manipulation (Therapeutic Massage)**20 Hrs**

- a) History, various types of soft tissue manipulation techniques.
- b) Physiological effects of soft tissue manipulation on the following systems of the body: Circulatory, Nervous, Musculoskeletal, Excretory, Respiratory, Integumentary system and Metabolism.
- c) Classify, define and describe: Effleurage, Petrissage, Friction Manipulation and Tapotement.
- a.) Preparation of Patient and Therapist, effects, uses, indications and contraindications of the above manipulation.

Section – V Relaxation & Therapeutic Gymnasium**10 Hrs**

1. Relaxation:
 - a) Describe relaxation, muscle fatigue, muscle spasm and tension (mental & physical)
 - b) Factors contributing to fatigue & tension
 - c) Techniques of relaxation (local and general)
 - d) Effects, uses and clinical application
 - e) Indication & contraindication.
2. Therapeutic Gymnasium
 - a) Setup of a gymnasium & its importance.
 - b) Various equipments in the gymnasium.
 - c) Operational skills, effects & uses of each equipment.

Exercise Therapy-1 Practical

1. To study and practice different types of movements and its subtypes. To study & practice the various techniques of Progressive Resistance Exercises of muscles region wise.
2. To practice all the soft tissue manipulative techniques region wise - upper limb, lower limb, neck, back and face.
3. To practice the measurement of ROM of joints - upper limb, lower limb & trunk.
4. To practice the grading of muscle strength region wise - upper limb, lower limb and trunk.
5. To study the position of joints, muscle work and stability of various fundamental and derived positions.
6. To study the different types of muscle contraction, muscle work, group action of muscles..
7. To practice the various types of suspension therapy and its application on various parts of body - region wise.
8. To study & practice local & general relaxation techniques.
9. To study the structure & function along with application of various equipment's in a Therapeutic gymnasium.

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ELECTROTHERAPY-I (1st BPT)

Paper – V Time: 3 Hrs.

Theory: 80+ 20 Int. Assess. = 100

Practical: 80+ 20 Int. Assess = 100

Teaching hours: Theory = 100, Practical = 100

COURSE DESCRIPTION: The module is intended to provide the student understanding of functioning of various electrotherapeutic equipment's used in Physiotherapy.

COURSE OBJECTIVES: At the end of the course, the student should be able to understand:

- The basic physics behind the working of various electrotherapeutic modalities used in the clinic

TEXT BOOK / REFERENCE BOOKS:

1. Electrotherapy Explained: Principles & Practice - Low & Reed - Butterworth Heinemann.
2. Clayton's Electrotherapy, (9th edi.) Forster & Palastanga Bailliere Tindall.
3. Therapeutic Heat and Cold - Lehmann - Williams & Wilkins.
4. Principles and Practice of Electrotherapy - Kahn - Churchill Livingstone.
5. Textbook of Electrotherapy – Jagmohan Singh - JAYPEE Bros, New Delhi

SECTION-A (15Hrs)

1. Fundamentals of Electrotherapy:

- Structure and Properties - of matter - solids, liquids and gases, adhesion, surface tension; viscosity, density and elasticity.
- Structure of atom, molecules, elements and compounds.
- Election theory, static and current electricity.
- Conductors, Insulators, Potential difference, Resistance & Intensity.
- Ohm's Law - Its application to AC & DC currents.
- Rectifying Devices - Thermionic Valves, Semiconductors; Transistors,
- Amplifiers, Transducers Oscillator circuits.
- Capacitance, condensers in DC and AC circuits.
- Display devices & indicators - analogue & digital.

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- Chemical effects - Ions and electrolytes, Ionization, Production of a E.M.F. by chemical action.
- Magnetic effects, Molecular theory of magnetism, Magnetic fields,
- Electromagnetic induction.
- Milli ammeter and Voltmeter, Transformers and Choke Coil.
- Thermal Effects – Joule’s Law and Heat production.
- Physical Principles of sound and its properties.
- Physical Principles of light and its properties.
- Electromagnetic spectrum - biophysical application.
- Principles of Application: Electrode tissue interface, Tissue Impedance, Types of Electrode, Size & Placement of Electrode – Water bath, Unipolar, Bi-polar,
- Electrode coupling, Current flow in tissues, Lowering of Skin Resistance.
- Brief outline of main supply of electric current; Dangers - short circuits, electric shocks, Earth Shock; Precautions - safety devices, earthing, fuses etc.; First aid & initial management of electric & earth shock.

2. Electro Physiology:

- Electrogenic membranes response-chemo responsive electrogenic systems. Neuromuscular junction-synapse-muscle electrogenic electro physiology of C.N.S. Action potential, resting membrane potential, propagation of action potential.
- Tissue impedance, Electrode tissue interface.

SECTION-B (55Hrs)

1. Therapeutic currents: Introduction to Direct, Alternating, Modified direct current.

2. Faradic Current:

- Production, Instrumentation, Physiological & Therapeutic effects, indication, contraindication, precaution, dangers and treatment procedure. Current parameter.
- Principles of application, preparation of instrument and patient, method (Labile & Stable), Motor point stimulation
- Faradic foot Bath & Hand bath-Introduction, indications, contraindications, precautions and potential dangers, Method of application: -Requirements of tools for Faradic foot bath, Machine preparation, patient preparation, preparation of the part to be treated, application/ set up- current parameters, instruments operation and recording.
- Faradism under pressure-Introduction, Method of application: -Requirements of tools for Faradism under pressure, Method of crepe bandage application Machine

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preparation, patient preparation, preparation of the part to be treated, application/ set up- current parameters, instruments operation and recording.

3. Interrupted direct current:

- a. Galvanic current: Production, Instrumentation, Physiological & Therapeutic effects, indication, contraindication, precaution, dangers and treatment procedure. Current parameter. Principles of application, preparation of instrument and patient, method (Labile & Stable), Motor point stimulation.
- b. High Voltage Pulsed Galvanic Stimulation (HVPGS)-Introduction, current parameters, therapeutic effects, electrode placement, indications & contraindications, Method of application, Requirements of tools , Machine preparation, patient preparation, preparation of the part to be treated, application/ set up- current parameters, instruments operation and recording.
- c. Functional Electrical Stimulation (FES): Introduction, current parameters, physiological and therapeutic effects, Method of application, indications and contraindications and Potential dangers.

4. Iontophoresis –Definition, Principles, commonly used drugs, indication, contraindication, precaution, and treatment procedure.

5. Evenly alternating currents (A.C):

- a. Diadynamic Currents: History, Introduction, Basic principles, types with parameters, physiological effects, therapeutic effects, indications, contraindications, Potential dangers and precautions, Method of applications of Diadynamic Currents: -electrode placement, Dosage: -Frequency, Intensity, duration, frequency of treatment
- b. Sinusoidal currents: - Definition, current parameters, physiological effects, therapeutic effects, indications and contraindications, Potential dangers and precautions, Method of applications of sinusoidal Currents: -electrode placement, Dosage: -Frequency, Intensity, duration, frequency of treatment.

6. Transcutaneous Electrical Nerve Stimulations (TENS):

Definition, Types of TENS with pulse widths, frequencies, intensities and mode used in TENS applications. Electrode placement, Theories of pain relief by TENS. Method of application: - Machine preparation, patient preparation, position of patient, demonstration about treatment, application/ set up, Therapeutic effects, Indications, Contraindications, Precautions, Danger

7. Electro – diagnostic tests:

Types of peripheral nerve lesion and development of reaction of degeneration. S.D. Curve plotting: Definition, Requirements of tools, procedure of S-D Curve plotting, measurement of the Rheobase and chronaxie, Demonstration of curve plotted in Graph and its clinical significance. F.G.Test/Faradic & Intermittent direct current (i.d.c) test.

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SECTION C (30)

1. Actinotherapy

- a. Infra-Red Rays (IRR) – Wavelength, frequency, types & sources of IRR generation, techniques of irradiation, physiological & therapeutic effects, indications, contraindications, precautions, and Procedure of treatment.
- b. Ultraviolet rays (UVR): Wavelength, frequency, types & sources of UVR generation, techniques of irradiation, physiological & therapeutic effects, indications, contraindications, precautions, procedure of treatment, Dosimetry of UVR. Different types of skin sensitive to UVR, Procedure of test dose calculation of UVR, Relation of test dose of UVR with other Doses, Progression and Frequency of treatment, PUVA Treatment with dosage, Theraktin Tunnel, High power mercury vapor lamp.

2. Superficial Heat

- a. Paraffin wax bath-components and preparation, Method of application, Physiological & therapeutic effects, indications, contraindications, precautions, operational skills of equipment & patient preparation.
- b. Moist heat- Introduction, Method of application, Physiological & therapeutic effects, indications, contraindications, precautions, operational skills of equipment & patient preparation.
- c. Contrast Bath-Introduction, Principles, therapeutic temperature of Hot and Cold water, Physiological & therapeutic effects, indications, contraindications, precaution, Method of application.
- d. Electrical heating pads: - introduction, Advantages and Disadvantages, treatment procedure, potential danger, indications and contraindications.
- e. Whirl poolbath: - Introduction, Types, technique of application, advantages and disadvantages.
- f. Fluidotherapy: - Introduction, technique of application, advantages and disadvantages.

3. Cryotherapy:

Introduction, Principles, Physiological & therapeutic effects, Indications, Contraindications, Precaution. Danger.

Evaporating Sprays, Cryokinetics, Cryostretch.

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ELECTROTHERAPY-I (PRACTICAL)

PRACTICAL HOURS: 100 Hrs

1. To study the basic operation of electric supply to the equipment & safety devices.
2. To experience sensory and motor stimulation of nerves and muscles by various types of low frequency currents.
3. OPERATION AND DIFFERENT METHODS OF APPLICATION/ PRINCIPLES OF APPLICATION OF THERAPEUTIC MODALITIES: The following protocol need to be followed in therapeutic modalities:
 - a. Requirement of tools:
 - b. Preparation of patient-
 - i) position of the patient
 - ii) Position of the treatment part
 - iii) Explanation/ Demonstration about applied modalities to patient
 - c. Preparation of Therapist
 - d. Examination and test of treatment area/ skin surface.
 - e. Preparation of the part to be treated
 - f. Preparation of apparatus
 - g. Setting up
 - h. Application
 - i. Termination
 - j. Record
4. To locate and stimulate different motor points region wise, including the upper & lower limb, trunk-technique of application of Faradic type current, Galvanic current/stimulation (D.C & I.D.C).
5. HVPGS
6. Faradic Foot Bath
7. Faradic Hand Bath
8. Faradism Under Pressure

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9. Transcutaneous Electrical Nerve Stimulation (TENS)
10. S-D Curve
11. F.G Test
12. Infra Red Radiation (IRR)
13. Ultra-Violet Radiation (UVR)
15. Paraffin Wax Bath
16. Moist Heat
17. Contrast Bath
18. Electrical Heating Pad
19. Cryotherapy, Evaporating Spray and Cryokinetics

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Paper- VI

Health Care Delivery system Including English Communication Skill

M. Marks: 50 (Theory)
Teaching Hours – 50 hours

Course Description : The Course is designed to enable students to a basic insight into the main features of Indian health care delivery system and how it compares with the other systems of the world and enhance ability to comprehend spoken and written English (and use English) required for effective communication in their professional work. Students will practice their skills in verbal and written English during clinical and classroom experiences.

Health Care Delivery system:

1. Introduction to healthcare delivery system
 - i. Healthcare delivery system in India at primary, secondary and tertiary care
 - ii. Community participation in healthcare delivery system
 - iii. Health system in developed countries.
 - iv. Private Sector
 - v. National Health Mission
 - vi. National Health Policy
 - vii. Issues in Health Care Delivery System in India
2. National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Health Programme.
3. Introduction to AYUSH system of medicine
 - a. Introduction to Ayurveda.
 - b. Naturopathy
 - c. Unani
 - e. Homeopathy
 - f. Need for integration of various system of medicine
4. Introduction to Yoga – Conceptual framework, various “asanas” the body – mind relationship, effects & precautions.

English Communication Skill

1. Basic Language Skills: Grammar and Usage.
2. Business Communication Skills. With focus on speaking - Conversations, discussions, dialogues, short presentations, pronunciation.
3. Teaching the different methods of writing like letters, E-mails, report, case study, collecting the patient data etc. Basic compositions, journals, with a focus on paragraph form and organization.
4. Basic concepts & principles of good communication
5. Special characteristics of health communication
6. Types & process of communication – verbal, non-verbal and written communication. Upward, downward and lateral communication.
7. Therapeutic communication: empathy versus sympathy.
8. Communication methods for teaching and learning.
9. Communication methods for patient education.

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Paper – VII Computer Applications (Practical)

M.Marks : 50

Teaching Hours: 50 Hrs (Practicals)

Note : Only Practical examination will be conducted for this paper.

1. To study the various components of a personnel computer.
2. To have working knowledge of various hardwares and softwares.
3. To have working knowledge of Common Operating Systems.
4. To practice the operational skills of common computer applications, including work processing and spread sheet software.
5. Introduction to MS Office:

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.

6. To have a basic knowledge of utility of multi-media.
7. To learn skills of web surfing – For literature, researches relevant to the field of medicine.

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BPT Second Year

Paper –I Exercise Therapy – II

Time: 3 Hrs.

Theory: 80+ 20 Int. Assess. =100
Practical: 80+ 20 Int. Assess = 100

Teaching hours: Theory = 150, Practical = 150

COURSE DESCRIPTION: The module is intended to provide the student understanding the basics of movement. The students will be taught about different exercise therapy instruments which use to assess the patients as well as to give treatment.

COURSE OBJECTIVES: At the end of the course, the student should be able to demonstrate:

- Various basic of exercise therapy evaluation format in Physiotherapy treatment methods on simulated patients in the labs
- The basic physics behind the movement
- Ability to formulate exercise prescription to the patient

Section – I: Therapeutic Exercise 50Hrs

1. Principle, Classification, techniques, physiological &therapeutic effects, indications & contraindications oftherapeutic exercises. Study aerobic and anaerobicexercises.
2. **Stretching:** Classification, techniques, physiological &therapeutic effects, indicationsandcontraindications ofstretching.
3. **Assessment & evaluation** of a patient (region wise) to plan atherapeutic exercise programme.
4. **Muscle Insufficiency** – Etiogenesis of muscle insufficiency(Strength, Tone, Power, Endurance)
5. **Neuromuscular Incoordination:** Normal neuromuscularcoordination, Etiogenesis of neuromuscular incoordination &general therapeutic techniques, effects, indications,contraindications & precautions.
6. **Functional re-education** – General therapeutic techniques tore-educate ADL function.

Section – II : Posture, Balance, Gait

30Hrs

1. Normal Posture- Overview of the mechanism of normal posture
2. Abnormal Posture– Assessment, Types, Etiogenesis, Management, including, therapeutic exercises.
3. Static and Dynamic Balance – Assessment & management including therapeutic exercises.
4. Gait- Overview of normal gait & its components.
5. Gait deviations – Assessment, types, etiogenesis, management, including therapeutic exercises.
6. Types of walking aids, indications, uses, measurements and various training techniques.

Section – III: Hydrotherapy

10Hrs

1. Basic Principles of fluid mechanics related to hydrotherapy.
2. Physiological & therapeutic effects of hydrotherapy including joint mobility, muscle strengthening & wound care etc.
3. Types of Hydrotherapy equipment's, indications, contraindications, operational skills & patient preparation.

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Section – IV: Special Techniques:

60Hrs

Joint Mobility – Etiogenesis of joint stiffness, general techniques of mobilization, effects, indications, contraindications & precautions.

1. Introduction to special mobilization (Maitland & Kaltenborn) & manipulation techniques, effects, indications & contraindications.
2. Conceptual framework, principle of Proprioceptive Neuromuscular Facilitation (PNF) techniques, including indications, therapeutic effects and precautions.
3. Principles of traction, physiological & therapeutic effects, classification, types, indications, contraindications, techniques of application, operational skills & precautions.
4. Review normal breathing mechanism, mechanism of coughing, types and techniques of application, indications, contraindications, therapeutic effects & precautions of breathing exercises.
5. Postural drainage: Effects, indications, contraindications, precautions and technique of applications.
6. Group Therapy – Types, advantages & disadvantages.
7. Exercises for the normal person- Importance and effects of exercise to maintain optimal health & its role in the prevention of diseases. Types, advantages disadvantages, indications, contraindications & precautions for all age groups.

Exercise Therapy – II (Practical)

1. To practice assessment & evaluative procedures, including motor, sensory, neuromotor co-ordination, tests for incoordination and Frenkel's Exercise, vital capacity.
2. To study & practice the various techniques of stretching.
3. To study & practice the various techniques of mobilization of joints region wise.
4. To study & practice the various techniques of PNF.
5. To study & practice the use of various walking aids in gait training and limb length measurement.
6. To assess & evaluate ADL's and practice various training techniques.
7. To study & practice mat exercises and Functional Re-education
8. To assess & evaluate normal & abnormal posture & practice various corrective exercises.
9. To assess & evaluate equilibrium/ balance & practice various techniques to improve balance.
10. To study the structure & functions of hydrotherapy equipment & their applications.
11. To study & practice various manual traction techniques.
12. To study & practice techniques of postural drainage and breathing exercises, huffing, coughing, incentive spirometry.
13. To study & practice various group exercises.
14. To study, plan & practice exercise program for of various age groups.

TEXTBOOK / REFERENCE BOOKS:

1. Hydrotherapy, Principles and Practices - Campion - Butterworth Heinmann.
2. Proprioceptive Neuromuscular Facilitation - Voss et al - Williams and Wilkins.
3. Maitland's peripheral manipulation: edited by Elly Hengeveld, Kevin Banks
4. Manual Mobilisation of the Joints- Freddy M. Kaltenborn.
5. Therapeutic Exercise Moving Toward Function, Brody LT, Hall CM, Hall C.

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ELECTROTHERAPY – II (2ndBPT)

(Total Theory + Practical/Clinical = 300hours)

Paper – II Electrotherapy – II

Time: 3 Hrs. Theory: 80+ 20 Int. Assess. = 100

Practical: 80+ 20 Int. Assess = 100

Teaching hours: Theory = 150, Practical = 150

COURSE DESCRIPTION: The module is intended to provide the student understanding of functioning of various electrotherapeutic equipment's used in Physiotherapy.

COURSE OBJECTIVES: At the end of the course, the student should be able to demonstrate:

- The application of various types of therapeutic currents used in Physiotherapy
- Various basic evaluation and Physiotherapy treatment methods on simulated patients in the labs

Text Books / Reference Books:

1. Electrotherapy Explained: Principles & Practice - Low & Reed - Butterworth Heinemann.
2. Clayton's Electrotherapy, (9th edi.) Forster &Palastanga Bailliere Tindall.
3. Therapeutic Heat and Cold - Lehmann - Williams & Wilkins.
4. Principles and Practice of Electrotherapy - Kahn - Churchill Livingstone.
5. Textbook of Electrotherapy – Jagmohan Singh - JAYPEE Bros, New Delhi

SECTION – A (20 Hrs)

1. Interferential Therapy/Current (IFT/IFC):

Introduction, Physical principles of IFC, Treatment Parameters:- Amplitude Modulation Frequency (AMF), Frequency Sweep, Method of Electrode placement:- Bipolar(exogenous) & Quadripolar (Endogenous), Mode:- vector/ scanning, Types of electrodes, Intensity of current, Duration of treatment Physiological Effects:- stimulation of muscle, Relief of Pain, Circulatory effects, Effects on Metabolism and effects on Autonomic Nervous System(ANS), therapeutic effects:- Pain relief, Edema relief, stress-incontinence, Indications, contraindications, techniques of application, precautions, and Procedure of treatment.

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2. Russian Current:

History, introduction, current parameters, therapeutic effects, indications and contraindications and Procedure of treatment: - protocol of muscle strengthening & protocol of spasticity reduction.

3. Rebox Current:

History, introduction with current parameter, physiological effects, and method of treatment, indications, and contraindications.

SECTION – B (30 Hrs)

1. Short Wave Diathermy (SWD):

Introduction with basic parameters, Production, Effects of high frequency currents on the tissues-i) vibration of ions, ii) Dipole rotation, iii) Molecular distortion, Principles of application-i) Inductive method, ii) capacitive method, spacing of electrodes, size of electrodes & position of electrodes relative to the tissues, Physiological effects, Therapeutic effects, Techniques of application, Indications, Contraindications, Precautions and Potential dangers.

2. Pulsed High Frequency Electromagnetic Energy- Pulsed Shortwave (PSWD)-

Introduction, Production with output, Therapeutic mechanisms, Physiological effects, Therapeutic uses, Indications, Contraindications,

2. Long Wave Diathermy (LWD)-

Introduction with parameters, Production, physiological and therapeutic effects, techniques of application, indications, contraindications, precautions and potential dangers.

3. Micro Wave Diathermy (MWD)-

Introduction with parameters, Production, Physiological effects, therapeutic effects, techniques of application, indications, contraindications, precautions, and Potential Dangers.

SECTION – C (20Hrs)

1. Light Amplification by Stimulated Emission of Radiation (LASER) –

Definition, historical background, physical principles- Monochromaticity, Coherence & Collimation, Types of LASERS with wavelength & Radiation, Principles of LASER, Effects of LASER Radiation on the tissues, Production, therapeutic uses, Principles of application, indications, contraindications, precautions & potential dangers.

2. Ultrasound/ Ultrasonic Therapy (UST)–

Definition, Nature of sonic waves, Properties and transmission of sonic wave, Production, Absorption of sonic wave-attenuation of US in tissues, pulsed UST & its effects, Biophysical effects, Physiological effects-thermal and non-thermal effects, Therapeutic effects:- effects of UST on inflammation and repair process(acute stage, proliferative/ granulation stage,

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remodeling stage), Therapeutic uses:-varicose ulcers, pain relief acute tissue injury, scar tissue, blood flow, bone injury, Principles of application:- coupling media & its % of transmission, reason of continuous movement of head, Method of application:- Direct contact application with its techniques, water bath application, water bag application & solid sterile gel as couplant.

Dosage: -mode, frequency, intensity, duration, progression & timing, indications, contraindications, precautions and procedure of treatment region wise.

Phonophoresis: - Definition, penetration of phonophoretically driven drugs, drugs used in phonophoresis, indication & contraindication.

3. Extracorporeal Shock Wave Therapy (ESWT):

Principles, therapeutic effects, Indications, Contraindications, Precautions, and procedure of treatment.

SECTION – D (15 Hrs)

1. Intermittent Pneumatic Compression Therapy (IPCT):

Principle, biophysical effects, types, therapeutic effects, indications, contraindications, precautions, and procedure of treatment.

2. Therapeutic Mechanical Traction:

Introduction, Types of Traction used in Physiotherapy, Mode of traction, Magnitude of Forces applied in different types of traction used in Physiotherapy, indications, contraindications and procedure of treatment.

SECTION – E (15Hrs)

1. E.M.G:

Definition, principles, Instrumentation, Procedure, clinical significance, indications and contraindication

2. Nerve Conduction Velocity Test (NCVT)/Nerve conduction Studies (NCS):

Definition, Principles, Types, Instrumentation, Procedure, clinical significance, indications and contraindications.

3. Biofeedback:

Introduction, Principles, Instrumentation, therapeutic effects, clinical significance, indications, contraindications, limitations, precaution.

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ELECTROTHERAPY – II (PRACTICAL)-150 HRS

1. OPERATION AND DIFFERENT METHODS OF APPLICATION/ PRINCIPLES OF APPLICATION OF THERAPEUTIC MODALITIES: The following protocol need to be followed in therapeutic modalities:

- a. Requirement of tools:
- b. Preparation of patient-
 - i) position of the patient
 - ii) Position of the treatment part
 - iii) Explanation/ Demonstration about applied current to patient
- c. Preparation of Therapist
- d. Examination and test of treatment area/ skin surface.
- e. Preparation of the part to be treated
- f. Preparation of apparatus
- g. Setting up
- h. Application
- i. Termination
- j. Record

2.Short Wave Diathermy (SWD), High Frequency Electromagnetic Energy- Pulsed Shortwave (PSWD):

3. Long Wave Diathermy (LWD)

4. Micro Wave Diathermy (MWD)

5. Interferential therapy (IFT/IFC)

6. Russian current

7.Rebox Current

8. Light Amplification by Stimulated Emission of Radiation (LASER)- its operation and different methods of application – region wise-Principles of application is as followsa.

Requirement of tools:

- b. Preparation of patient-

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- i) position of the patient
- ii) Position of the treatment part
- iii) Explanation/ Demonstration about applied current to patient

c. Preparation of Therapist

d. Examination and test of treatment area/ skin surface.

e. Preparation of the part to be treated

f. Preparation of apparatus

g. Setting up

h. Application

i. Termination

j. Record

k. Dosage: wavelength, area of application, energy density, pulsed output, progression of treatment.

9. Ultrasound Therapy (UST), Phonophoresis

10. Extracorporeal Shock Wave Therapy (ESWT)

11. Intermittent Pneumatic Compression Therapy (IPCT)

12. Mechanical traction

13. To observe various Electro – EMG procedures.

14. To observe various Electro – NCV procedures.

15. To study a Bio feedback unit, its operation, and different methods of application – region wise.

Text Books / Reference Books:

1. Electrotherapy Explained: Principles & Practice - Low & Reed - Butterworth Heinemann.
2. Clayton's Electrotherapy, (9th edi.) Forster & Palastanga Bailliere Tindall.
3. Therapeutic Heat and Cold - Lehmann - Williams & Wilkins.
4. Principles and Practice of Electrotherapy - Kahn - Churchill Livingstone.
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BIOMECHANICS (2nd BPT)

(Total Theory + Practical/Clinical = 300hours)

Time: 3 Hrs. Theory: 80+ 20 Int. Assess. = 100

Practical: 80+ 20 Int. Assess = 100

Teaching hours: Theory = 150, Practical = 150

COURSE DESCRIPTION: This subject is intended to provide assistance to the student to acquire adequate knowledge in basic mechanics and human biomechanics and to be able to understand the kinetics and kinematics during various activities.

COURSE OBJECTIVES: At the end of the course, the student should be able to understand:

- The principles of biomechanics and their application in health and disease
- The movement analysis and muscle work involving various joints of the body
- The normal and abnormal posture and gait

Section – I Mechanics

10Hrs

- Introduction to mechanics including motion, forces, parallel forces system.
- Newton's law of motion, concurrent force systems – composition forces, muscle action line etc.
- Centre of Gravity, line of gravity, stability and equilibrium.
- Introduction of Bio-Mechanics and terminology.

Section – II Joint Structure and Function:

20 Hrs

- Basic principles of Joint design and a human joint.
- Tissues present in human joint including fibrous tissue, bone cartilage and connective tissue.
- Classification of joints.
- Joint function, Kinematics chains and range of motion.
- Recall anatomy and study the biomechanics of the spine, shoulder girdle, joints of the upper extremity, pelvic girdle and the joints of the lower extremity.

Section – III Muscle Structure and function:

15 Hrs

- Mobility and stability functions of muscle.
- Elements of muscle structure and its properties.
- Types of muscles contractions and muscle work.
- Classification of muscles and their functions.
- Group action of muscles, Co-ordinated movement.

Section IV Biomechanics of Complexes

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1. **Biomechanics of Vertebral Column: General structure and Function (Region wise), Mobility and Stability of Vertebral Column, Muscles of the Vertebral Column, Biomechanics pelvic girdle, General effects of Aging and Injury**
2. **Biomechanics of Shoulder Complex: Components of shoulder complex, Integrated Function of Shoulder Complex, Mobility and Stability of Shoulder Complex, Structural and Functional Dysfunctions around Shoulder Complex**
3. **Biomechanics of Elbow Complex: Structure and function of the Elbow Complex, Structure and Function of the superior and inferior Radio-ulnar Joints, Mobility and Stability of Elbow Complex, Effect of Immobilization and Injury**
4. **Biomechanics of the Wrist and Hand Complex: Structural components of the Wrist complex, function, structure and function of the Hand Complex, Finger Musculature, Functional Position of the Wrist and Hand**
5. **Biomechanics of Temporomandibular Joint**
6. **Biomechanics of the Hip Complex: Structure and Function of the Hip Joint, Arthrokinematics and Osteokinematics, Hip Joint Musculature, Stability, Muscle Function in Bilateral and Single leg Stance, Trabecular System, Biomechanical alteration in various Hip joint Pathology**
7. **Biomechanics of the Knee Complex: Structure and Function of the Tibiofemoral Joint, Static and Dynamic stability of Tibiofemoral Joint, Structure and Function of the Patellofemoral Joint, Stability of Patella, Biomechanics changes in the Knee complex with Pathology**
8. **Biomechanics of the Ankle Complex: Kinematics and Kinetics of the Tibiotalar Joint, Stability of the Ankle Joint, Arch of foot, Effect of weight bearing on foot**

Section – V Posture & Gait:

30Hrs

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- a) Posture – Definition, factors responsible for posture, relationship of gravity on posture.
- b) Postural imbalance – factors responsible for imbalance in Static and dynamic positions including ergonomics.
- c) Description of Normal gait, determinants of gait, spatio temporal features and analysis.
- d) Gait deviations – Types, Causative factors and analysis.

ERGONOMICS

10 Hrs

- a. Definition, principles, evaluation and management- engineering, administrative and personal protective devices
- b. Mechanical hazards-overuse/fatigue injuries due to ergonomic alteration & ergonomic evaluation of workplace-mechanical stresses per hierarchy – i. sedentary table work – executives, clerk, ii. inappropriate seating arrangement- vehicle drivers iii. constant standing- watchman- Defense forces, surgeons, iv. Over-exertion in laborers,-common accidents –Role of P.T.-Stress management.

PRACTICAL HOURS : 50 HRS

100 MARKS

1. To study the effects of forces on objects.
2. To find out the C.G. of an object.
3. To identify axis and planes of motion at the joints of spine, shoulder, girdle, joints of upper extremity, Pelvic girdle and joints of lower extremity.
4. To study the different types of muscle contraction, muscle work, group action of muscles of coordinated movements.
5. Analysis of Normal posture respect to L.O.G. and the optimal position of joints in Antro-posterior and lateral views.
6. Analysis of normal gait and measurement of spatic temporal features.

TEXTBOOK / REFERENCE BOOKS:

1. Joint Structure and Function: A Comprehensive Analysis by Pamela K. Levangie, Cynthia C. Norkin
2. Kinesiology of the musculoskeletal system, Foundations for Physical rehabilitation- Donald A Neumann.

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Psychology and Sociology

Section –A (Psychology)

Theory: 100 Marks: 40+10 (I.A.)

A Sound knowledge of psychology is essential to help the student understand himself/herself and other people have to develop into personal relationships. This knowledge should then be applied in working with any patient and as a member of the Treatment team. This subject will form the basis for later study of psychology.

I. General Psychology:

1. Definition of Psychology.

Science of mind, consciousness and behavior , Scope and branches of Psychology , Methods of Introspection,

observation and experimentation.

2. Hereditary and Environment

Relative importance of heredity and environment , Physical characteristics intelligence and personality.

3. Learning

Types of learning

Trial and error, Classical Learning Instrumental learning, Insight for learning

4. Memory

Steps of memory, Measurement of memory, Causes of forgetting(diff. types only), Concept of STM & LTM

5. Perceptual Process

Nature of perceptual process, Structural and functional factors in perception, Illusion and Hallucination

6. Emotion

Emotion and feeling, Physiological changes, Theories of emotion (James-Lange and Eonnon-Bird)

7. Motivation

i) Motive need and Drive, Types of motive: Physiological, Psychological and Social

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Definitions: theory and assessment of I.Q.

9. Personality: Definition, Types and measurement.

II. Child Psychology

Concept of child Psychology - Meaning, nature, and subject matter of child Psychology, Practical importance of

studying child Psychology for Physiotherapist or rehab team member Methods of studying child development, Baby

Biography, Case History, Behavioral abnormalities. **III. Industrial Psychology:**

1. Human Engineering, Importance of human engineering, Development in human engineering, problems in human engineering
2. Decision making process and steps indecision making, Individual decision making, decision making in organization
3. Stress and mental health, causes and reaction to stress, job stress and its management
4. Work culture, moral and reward of work discipline
5. Guidance and counseling- different types of counseling, meaning types and objectives of counselor.
6. **Rehabilitation Psychology:**

Purpose of studying, Interpersonal relationships, Familial & Social relationships, acceptance about the disability – its outcome in relation to different diagnostic categories psychological aspects of multiple handicapped, contribution of psychology in Total Rehab. Specific Rehabilitation Programme

Section B: (Sociology) Marks: 40+10 (I.A.)

1. Introduction

Definition of Sociology, Sociology as a science, uses of the study of Sociology, application of knowledge of sociology in Physiotherapy

2. Sociology and Health

Social factors affecting health status

3. Socialization Meaning of socialization

4. Social groups

Concepts of social groups: formal and informal group (Definition only), primary groups and secondary groups (Definition only)

5. Family

Definition, Influence of family on human personality, Types, Functions of a Family

6. Culture

Definition and Relevance

7. Caste system

Definition and utility

8. Social Control: Definition, Customs, Law

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9. Social problems : names and reasons with solutions as a whole

10. Social security: Definition


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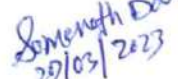

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Pathology, Microbiology and Pharmacology

General Pathology Marks: 30+10 (I.A.)

1. Aims and objectives of the study of pathology. Meaning of terms, etiology, pathogenesis and lesions
2. Causes of disease and cell injury – features of cell injury, mechanism of cell injury – hypoxia, free radical injury. Necrosis and gangrene
3. Inflammation- definition, events of acute inflammation, chemical mediator of inflammation, morphological types of acute inflammation, chronic inflammation, difference between acute and chronic inflammation
4. REPAIR –primary healing, secondary healing, factors affecting healing and repair healing of skin, muscle and bone.
5. Fluid and hemodynamic derangements – oedema, hyperemia, Haemorrhage, shock, embolism, thrombosis, infarction
6. Immunity – natural and acquired immunological mechanisms of tissue injury, hypersensitivity reactions, general features of autoimmune diseases and immunodeficiency diseases.
7. Neoplasia: characteristic of benign and malignant tumors, grading and staging of malignant tumors, a brief outline of the carcinogenic agents and methods of diagnosis of malignancy and general effects of malignancy on the host
8. Nutritional disorders: deficiency disorders (protein deficiency, vitamin deficiency (A,B,C,D,E,) causes , features , a brief outline of the methods of diagnosis.

Systemic Pathology:

A brief outline of etiology, pathogenesis and general features of disease of the following systems. (The morphology, microscopic details and details of diagnostic procedures are not required).

1. **Blood:** Disorders of RBC, WBC and platelets
2. **Blood Vessels:** Atherosclerosis, thromboangitisobliterance, varicose vein, DVT, thrombophlebitis, lymphoedema
3. **Disease of Heart:** Congestive cardiac failure, ischemic heart disease, rheumatic heart disease, infective heart disease (pericarditis, myocarditis, endocarditis)
4. **Respiratory System:** Pneumonias, Bronchiectasis, Emphysema, Chronic bronchitis, Asthma, Tuberculosis etc.
5. **Joints Disorders:** Arthritis- types and their features.
6. **Bone Disorders:** Osteoporosis, Paget's disease, Osteogenesis Imperfecta, Osteomyelitis, tumors– Osteosarcoma, Chondrosarcoma, Ewings sarcoma, Multiple myeloma (a brief outline only)
7. **Muscles:** Muscular dystrophy, Myasthenia gravis
8. **Nervous System:** Meningitis, encephalitis, vascular diseases of brain, poliomyelitis, nerve injuries

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Microbiology Marks: 25+5 (I.A.)

1. An introduction to microbiology, Classification of microorganisms,
2. Infection – Types, source, portals of entry, spread.
3. Prevention and control of infection, Disinfection and antiseptics Sterilization
4. An outline of the following infectious diseases with respect to the causative organism, mode of transmission, pathogenesis, prevention, and diagnostic tests (details of the execution and interpretation of the tests not required)
Chicken Pox, Measles, Mumps, Influenza, Diphtheria, Whooping Cough, Tetanus, Tuberculosis, Leprosy, Rubella, Cholera, Gastroenteritis, Food Poisoning, Hepatitis, AIDS, Typhoid, Rabies, STD, Ameobiasis, Kalaazar, Malaria, Filaria

Pharmacology Marks: 25+5 (I.A.)

1. General Pharmacology, drug allergy & idiosyncrasy, drug toxicity, different routes of administration.
2. Autonomic pharmacology.
3. Drugs acting on CNS/PNS Anesthetics, alcohols, alkaloids, narcotics, analgesics, antipyretics, sedatives,

stimulants & psychotherapeutics.
4. Drugs acting on C.V .S
5. Drugs acting on respiratory system.
6. Antibiotics & chemotherapeutic agents
7. Hormones and drugs affecting endocrine functions.
8. Drugs acting on G.I.System.
9. Immunomodulators
10. Vitamin D, Calcium, Iron, Blood related diseases
11. Heavy metals & antagonists.
12. Drugs acting on Muscles, Muscles relaxants.

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General Medicine and Cardio thoracic condition and Pediatrics

General Medicine

Each disease to be discussed under the following headings:-

- Definition
- Aetio-pathogenesis.
- Pathology
- Clinical Features
- Diagnosis
- Differential Diagnosis
- Principles of Management including physiotherapeutic management

Broad Topics:

1. Introduction of Medicine

2. General principles of assessment and management including physiotherapeutic management. Elementary idea about use of laboratory and imaging techniques
3. Diseases of Respiratory System
Approach to a patient with Respiratory Disease , Chronic Obstructive Pulmonary Disease.

Bronchial Asthma, Pneumonia, Lung Abscess, Bronchiectasis, Pleural Effusion & Empyema
Pneumothorax, Pulmonary tuberculosis, Respiratory Failure, Interstitial Lung Disease
Pulmonary Embolism

4. Diseases of GI system & Hepato-Biliary Disorders
Peptic Ulcer Disease, Malabsorption Syndrome, Inflammatory Bowel Disease, Approach to a patients of G.I.S.Disease, Upper G.I.S. bleed, Jaundice , Viral Hepatitis, Cirrhosis of Liver

Acute Pancreatitis

5. Diseases of Kidney

Approach to a patient of Renal Disease, Glomerulo Nephritis, Acute Renal Failure , Chronic Renal Failure, Dialysis, Nephrotic Syndrome, Urinary Tract Infections

6. Hematological Disease

Approach to a. patient with hematological disease, Anemia&its different types, Leukemia

Haemophilia, Haemoglobinopathies, Purpura, Oncology- Lymphomas, Lung Carcinoma

7. Endocrine & Metabolic Diseases

Acromegaly, Gigantism & Dwarfism, Diabetes Insipidus, Hypothyroidism, Hyperthyroidism
Adrenal hypo-function & hyper function, Diabetes Mellitus, Diabetic Neuropathy, Diabetic Foot Hypoglycemia, Vit-D, Calcium metabolism & Parathyroid Gland Disorders, Lipid Disorders

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8. Nutritional Diseases
Obesity, Protein Energy Malnutrition, Common Vitamin Deficiencies
9. Connective Tissue Diseases
Approach to a patient with Connective Tissue Disease, Rheumatoid Arthritis, Gout, Vasculitides
10. Infectious Diseases
Malaria, Filaria, Tetanus, Kala-azar, Typhoid Fever, HIV& AIDS , Diarrhoeal Diseases

M. Marks: 200 Theory: 100 Practical: 100

11. Diseases due to Environmental factors & Poisons
Heat Stroke , Radiation Injury, Snake Bite , General principles of management of poisoning

Organo-Phosphorus Poisoning, Sedative and hypnotic poisoning

Cardiology

1. Basic Anatomy of Heart, Coronary circulation.
2. Normal Cardiac contraction and relaxation mechanism
3. Acute Rheumatic Fever, Etiology, Clinical features and Assessment
4. Valvular Heart Diseases like Mitral Stenosis, Mitral Regurgitation, Aortic Stenosis, Aortic Regurgitation-

Clinical features and assessment

5. Ischemic Heart Disease- Clinical features and assessment
6. Hypertension- T ypes and management
7. Congestive Heart Failure
8. Peripheral V ascular Disease & Deep V ein thrombosis
9. Common Cardiac Arrhythmias

Pediatrics

1. Growth and development of a child from birth to 12 yrs of age indicating physical and adaptive developments.
 2. Maternal and neonatal factors contributing to high-risk pregnancy.
 3. Neonatal and Maternal infections.
 4. Maternal heart diseases, renal failure, tuberculosis, diabetes etc.
 5. Community Health Program like PPP; Blindness; Deafness and immunization Schedule.
 6. Cerebral Palsy- Definition, Outline of etiology of prenatal, perinatal and postnatal causes. classification, clinical features and assessment based on musculo skeletal system. Outline of associated defects like mental retardation, microcephaly, hearing and speech impairment, squint and convulsion.
 7. Muscular Dystrophy- Various forms mode of inheritance, clinical manifestations and its management physiotherapeutic ally.
8. Spina Bifida, Meningo myelocele- Outline of development clinical manifestations, bladder bowel control, hydrocephalus
9. Stills Disease- classification, pathology in brief, physical findings, course and prognosis. Prevention and correction of deformity

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10. Acute CNS infection- Classification, clinical findings, sequel leading to mental retardation, blindness, deafness speech defect, motor paralysis, bladder and bowel problems, seizure disorders feeding difficulties and pressure sores.

11. Normal diet for newborn and child, dietary calorie, fat, protein, minerals and vitamins requirements in normal child as well as in malnourished child.

12. Lung Infections- Outline of clinical finding complications of bronchitis's lung abscess, bronchial asthma, cystic fibrosis) primary complex in infants and children

13. Acute pediatric distress syndrome, neonatological & pediatric surgical care. 14. Neonatal and pediatric cardiovascular problems.

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General Surgery Including Cardio thoracic Surgery, Plastic Surgery, Obstetrics and Gynecology

M. Marks: 200 Theory: 100 Practical: 100

General Surgery

1. Principles of General Surgery and Anesthesia including blood transfusion and physiological response of the body to surgery
2. Pre and Post Operative complications and their management
3. Wounds: - Wound Infections, Sinuses and Ulcers. Burns- Different degrees. Complications of Burn

specially post burn contractures, Tetanus, Gangrene and gas gangrene
4. Outline of Abdominal surgery, Post-Operative complications and management in-

Appendisectomy, Herniorraphy, Mastectomy, Thyroidectomy, Colostomy, Cholecystectomy, Ileostomy
5. Role of Physiotherapy in General Surgery

Cardio Thoracic Surgery

Incisions for cardiothoracic surgery, General Pre and Post-Operative Physiotherapeutic Management patients of cardiothoracic surgery, various surgical procedures for chest and cardiac condition/disease

Plastic Surgery

1. Burn- Degrees of burn, General management of burn, Reconstructive surgery following burn and complications of burn
2. Types of Skin Grafts and Flaps
3. Principles of Tendon transfer
4. Surgery of hand with emphasis on reconstructive surgery in Trauma and in Leprosy

Obstetrics & Gynecology

1. Anatomy of Pelvic organs mechanism, physiology of pelvic floor, Sphincter muscles, Menstrual cycle, and its disorders, other hormonal disorders of females, Obesity and female hormones
2. Pregnancy and its stages, labour, stages of labour, delivery, Caesarian Section, Cancer of female reproductive organs, STD in females
3. Menopausal effects in emotion and musculo-skeletal system
4. Maternal physiology in pregnancy
5. Child birth complications, complication of multiple child birth, methods of birth control-Merits and

Demerits



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Neurology and Neuro-Surgery

1. General Principles of neurological assessment.
2. Cerebro-vascular disease, Hemiplegia
3. Acute infections of CNS – Encephalitis, Meningitis and Poliomyelitis
4. Traumatic Injury of Head & Spine, Paraplegia
5. Parkinsonism and other Extra-pyramidal disorders, Involuntary movements
6. Multiple Sclerosis and other Demyelinating diseases
7. ALS (Amyotrophic Lateral Sclerosis) & Other Motor Neuron disease
8. Disease/injury of peripheral nerves, cranial nerves & G.B. Syndrome
9. Myasthenia Gravis
10. Diseases of muscles like Polymyositis Muscular Dystrophy
11. Dementia, Alzheimers disease
12. Cerebral Palsy
13. Cervical & Lumbar Spondylosis and Disc Prolapse
14. Intracranial Tumors

Neuro-Surgery

1. Principles of Management of Cranial & Spinal trauma
2. Orientation about Neuro-Surgical Intensive care
3. Physiotherapeutic approach to Neurologically Disabled patients
4. Outline of clinical presentation of Brain Tumors & Spinal Cord Compression
5. Elementary idea about minimal invasive surgery in Neurosurgical perspective
6. Developmental anomalies of CNS
7. Patho-physiology of peripheral nerve injury & its principles of management
8. Degenerative diseases of spine & its physiotherapeutic management
9. Physiotherapeutic management of Pain Syndrome

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Orthopedics

1. Introduction to Orthopaedics: Introduction to orthopaedic terminology. Types of pathology commonly dealt with, clinical examination, common investigations X- rays & imaging techniques and outline of non – operative management.

2. Principles of operative treatment: List indications, contraindication and briefly outline principles of: Athrodesis, Arthroplasty, Osteotomy, Bonegrafting, Tendon – Transfers and Arthroscopy.

3. Sprains and Muscle Strains: List common sites of sprains and muscle strains and describe the clinical manifestations and treatment. viz. Tennis Elbow, Golfer's Elbow, Dequervain's disease, Tenovaginitis, Trigger finger, Carpal Tunnel Syndrome and Plantar Fasciitis etc.

4. Sports Injuries: Injuries related to common sports their classification and management.

5. Fractures and Dislocations: General Principles, outline the following:

- i) Types of Fractures including patterns. Open and closed fractures and fracture – dislocations
- ii) Differences between dislocation & subluxation.
- iii) General & Local signs & symptoms of fractures & dislocation.
- iv) Principle of management of fractures & dislocations.
- v) Prevention & treatment of complications including: Fracture – disease, Volkmann's Ischemic Contracture, Sudeck's Atrophy, Carpal Tunnel Syndrome. Myositis Ossificans and Shoulder-Hand syndrome
- vi) Fracture healing.

6. Upper Limb Fractures & Dislocations

- a) Enumerate major long bone fractures and joint injuries.
- b) Briefly describe their clinical features, principles of management and complications.

7. Lower Limb Fractures & Dislocations

- a) Enumerate major long bone fractures and joint injuries.
- b) Briefly describe their clinical features, principles of management and complication.

8. Spinal Fractures and Dislocations: Outline the mechanism, clinical features, principles of management and complications of spinal injuries.

9. Recurrent Dislocations: Outline the mechanism, clinical features, principles of management and complications of recurrent dislocation of the shoulder and patella.

10. Amputations

- a) Classify amputations. List indication for surgery,
- b) Outline pre-operative, operative and prosthetic management. c) Outline prevention and treatment of complications.

11. Bone & Joint Infections: Outline the etiology, clinical features, management and complications of septic arthritis osteomyelitis, Tuberculosis (including spinal T.B.).

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M. Marks: 200 Theory: 100

Practical: 100

12. Bone Joint Tumors: Classify and outline the clinical features, management and complications of the following (benign / malignant bone and joint tumors, Osteomas, Osteosarcomas, Osteoclastomas, Ewing's sarcoma, Multiplemyeloma)

13. Chronic Arthritis: Outline of pathology: clinical features, mechanism of deformities, management and complications of: Rheumatoid arthritis. Osteoarthritis of major joints and spine, Ankylosing spondylitis.

14. Neck & Back Pain, Painful Arc Syndrome, Tendinitis, Fascitis & Spasmodic Torticollis, (Outline the above including clinical features and management)

15. Spinal and Other Deformities: Classify spinal deformities and outline the salient clinical features, management and complications of Scoliosis, Kyphosis and Lordosis, Cervical Rib, Common acquired deformities of foot, knee, hip, shoulder, elbow and wrist including hand

16. Poliomyelitis: Describe the pathology, microbiology, prevention, management and complications of polio. Outline the treatment of residual paralysis including use of orthosis, Principles of muscle transfers and corrective surgery

17. Congenital Deformities: Outline the clinical features and management of Congenital Talipes Equinovarus (CTEV), Congenital Dislocation of the Hip, Flat foot, vertical talus, limb deficiency (radial club hand and femoral, tibial and fibula deficiencies) meningomyelocele, Arthrogryphosis multiplex congenita and Osteogenesis imperfecta

18. Peripheral Nerve Injuries: Outline the clinical features and management, including reconstructive surgery of:

- a) Radial, median and ulnar nerve lesions.
- b) Sciatic and lateral popliteal lesions.
- c) Brachial Plexus injuries including Erbs, Klumpke's and crutch palsy, Claw Hand

19. Hand Injuries: Outline of clinical features, management and complications of: Skin and soft tissue injury, tendon injury, bone and joint injury.

20. Leprosy: Outline of clinical features, management and complications of neuritis, muscle paralysis, tropic ulceration and hand & feet deformities.

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Physical and Functional assessment

Th 80+20, Practical 80+20

Teaching hours Th 100, Pract 100

COURSE DESCRIPTION: The module is intended to assist the student

- To develop the necessary skills in obtaining patient history and patient communication
- To be aware of basic evaluation methods
- To understand the expanded scope and role of physiotherapists by observation

COURSE OBJECTIVES: At the end of the course, the student should be able to:

- The student should be able to plan, design and execute various assessment and evaluation techniques to use clinical reasoning effectively for patient management

Text and reference books:

- Physical Rehabilitation by Susan O Sullivan
- Orthopedic Physical assessment by David J Magee
- Manipulative Physiotherapy by Biswas A
- Introduction to Ergonomics, Bridger RS, 2003, Taylor and Francis
- Ergonomics for beginners, Dul J & W B, 2008, Taylor and Francis
- Adult Hemiplegia, Berta Bobath
- Brunnstrom's movement therapy in hemiplegia : a neurophysiological approach, Sawnyr, Katherin A, 1992, Lippincott

Theory:

A. Assessment and evaluation – General

1. Assessment and its importance
2. Types of assessment
3. Subjective assessment/examination
4. Communication with its types, principles and errors
5. Physical assessment/examination of joints, muscles, blood vessels and nerves (general guideline)
6. Clinical reasoning, its types – HDR & IR
7. Clinical decision making and formulating management strategies
8. Difference of assessment and evaluation

B. Regional physical assessment of different areas including articular special tests,

ligamentous instability tests, muscle strength, length and activation patterns, vascular tests and neural tension tests of the following regions

1. Cervical spine with TMJ
2. Thoracic spine and rib cage
3. Lumbar spine and pelvis
4. Shoulder
5. Elbow and forearm
6. Wrist and hand
7. Hip
8. Knee

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9. Ankle and foot

C. Various school of thoughts of musculoskeletal physiotherapy.

1. Maitland concept including its philosophy, assessment principles, treatment techniques for spine and peripheral joints with contraindications and precautions
2. McKenzie concept with different types of syndromes in spine
3. Cyriax concept with its principles and soft tissue diagnosis
4. Mulligan concept with basic idea on NAG, SNAG and MWM
5. David Butler concept of neural mobilization

D. Various approaches of Neurological Physiotherapy, (philosophy and principle only)

1. BOBATH & NDT
2. Motor relearning process
3. Rood's approach
4. Brunstrom's movement therapy

E. Assessment of integrated human functions

1. Sensory examination
2. Motor examination
3. Coordination examination
4. Balance examination
5. GAIT and locomotion examination with its various types (motion, observational, force and energy cost) including elementary idea about uses of motion analyzer, force plate, gas analyzer
6. Posture examination in various planes
7. ADL with various scales and test batteries such as Barthel index, FIM etc
8. Pain assessment with its nature, distribution, pattern, pain radiation, pain referral, VAS with elementary idea about biopsychosocial model of pain.

F. Ergonomics and Occupational Health

1. Definition, types and importance
2. Common workplace problems and their ergonomic solutions
 - a) Common work-related musculoskeletal Disorders and their ergonomic solutions
 - b) Anthropometry and common anthropometric data

Practical:

- To practice and develop the skill of communication and reasoning.
- To practice and develop skill of physical assessment of different areas including articular special tests, ligamentous instability tests, muscle strength, length and activation patterns, vascular tests and neural tension tests of all over the body.
- To practice and develop skill of assessment and management techniques using Maitland approaches all over the body.
- To perform the NAG, SNAG & MWM
- To perform the Neural tension tests
- To practice and perform sensory, motor, balance, coordination, posture and observational gait assessment
- To practice and use various test batteries for ADL

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- To practice and perform pain assessment
- To measure anthropometric details

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Paper – VI Research Methodology and Biostatistics

Time: 3 Hrs.

Theory: 40+ 10 Int. Assess. = 50

Teaching hours: Theory = 50

Research Methodology

Section I :

15 Hrs

1. Introduction : Importance of research in clinical practice, scientific approach, characteristics, purposes and limitations.
2. Ethical issues in research, elements of informed consent.
3. Structure of a research proposal.
4. Types of Research
5. Study Design

Section II:

15 Hrs

1. Research Question including literature review.
2. Measurement, Principles of measurement, reliability and validity.
3. Types of Sampling.
4. Types of Hypothesis
5. Types of Variables

Section III

20 Hrs

Biostatistics

- i. Descriptive statistics.
- ii. Parametric and Non parametric test
- iii. Comparison of means, T-tests.
- iv. Analysis of Variance.
- v. Multiple comparisons.
- vi. Non-parametric statistics.
- vii. Correlations.
- viii. Application of common statistical tools & programs.

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Physiotherapy in Orthopaedics & Sports Paper-I

M. Marks: 200

Theory: 100

Practical: 100

COURSE DESCRIPTION: The module is intended to train the students to independently evaluate and assess and identify problems of the patient, develop skills to plan and set treatment goals and execute treatment/techniques based on evidence, to exercise professional and ethical judgment in the field of orthopedic rehabilitation science to deliver safe and effective patient management plans.

COURSE OBJECTIVES: At the end of the course, the student should be able to demonstrate:

- The knowledge and skill to evaluate, plan and execute physiotherapeutic treatment methods for managing patients with various neuromusculoskeletal (orthopedic) conditions.

TEXT BOOK / REFERENCE BOOKS:

1. Orthopedic Physical Assessment, 5th Edition by David J. Magee
2. Treatment and Rehabilitation of Fractures 1st Edition by Stanley Hoppenfeld MD
3. Clinical Orthopaedic Rehabilitation: An Evidence-Based Approach, 3rd Edition By S. Brent Brotzman
4. Management of Common Musculoskeletal Disorders: Physical Therapy Principles and Methods (Management of Common Musculoskeletal Disorders (Hertling)) Fourth Edition by Darlene Hertling BS RPT
5. Rehabilitation of the Hand and Upper Extremity, 2-Volume Set 6th Edition
6. **Sports Physiotherapy: Applied Science and Practice** by Marie Zuluaga

1. Principles of operative treatment: List indications, contraindication and briefly outline principles of: Arthrodesis, Arthroplasty, Osteotomy, Bonegrafting, Tendon – Transfers and Arthroscopy.

2. Sprains and Muscle Strains: List common sites of sprains and muscle strains and describe the clinical manifestations and treatment. viz. Tennis Elbow, Golfer's Elbow, Dequervain's disease, Tenovaginitis, Trigger finger, Carpal Tunnel Syndrome and Plantar Fasciitis etc.

3. Sports Injuries: Fundamentals of sports injuries:

- Sports medicine : Sports medicine team, sports medicine model, the challenges of management - diagnosis and treatment
- Sports injuries : acute injuries (bones, articular cartilage, joint, ligament, muscle, tendon, bursa, nerve, skin), overuse injuries, pain (joint, muscle, neural structures, referred pain, pain syndromes)
- Principles of injury prevention : warm up, stretching, appropriate training, adequate recovery
- Principles of Diagnosis : clinical assessment
- Physiotherapy Treatment used for different types of sports injuries: PRICE, Immobilization and early immobilization, Uses of different types of electro modalities & manual therapy.

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4. Fractures and Dislocations: General Principles, outline the following:

- i) Types of Fractures including patterns. Open and closed fractures and fracture – dislocations
- ii) Differences between dislocation & subluxation.
- iii) General & Local signs & symptoms of fractures & dislocation.
- iv) Principle of management of fractures & dislocations.
- v) Prevention & treatment of complications including Fracture – disease, Volkmann's Ischemic Contracture, Sudeck's Atrophy, Carpal Tunnel Syndrome. Myositis Ossificans and Shoulder-Hand syndrome
- vi) Fracture healing.

5. Upper Limb Fractures & Dislocations

- a) Enumerate major long bone fractures and joint injuries.
- b) Briefly describe their clinical features, principles of management and complications.

6. Lower Limb Fractures & Dislocations

- a) Enumerate major long bone fractures and joint injuries.
- b) Briefly describe their clinical features, principles of management and complication.

7. Spinal Fractures and Dislocations: Outline the mechanism, clinical features, principles of management and complications of spinal injuries.

8. Recurrent Dislocations: Outline the mechanism, clinical features, principles of management and complications of recurrent dislocation of the shoulder and patella.

9. Amputations

- a) Classify amputations. List indication for surgery,
- b) Outline pre-operative, operative and prosthetic management.
- c) Outline prevention and treatment of complications.

10. Bone & Joint Infections: Outline the etiology, clinical features, management and complications of septic arthritis osteomyelitis, Tuberculosis (including spinal T.B.).

11. Bone Joint Tumors: Classify and outline the clinical features, management and complications of the following (benign / malignant bone and joint tumors, Osteomas, Osteosarcomas, Osteoclastomas, Ewing's sarcoma, Multiplemyeloma

12. Chronic Arthritis: Outline of pathology: clinical features, mechanism of deformities, management and complications of: Rheumatoid arthritis. Osteoarthritis of major joints and spine, Ankylosing spondylitis.

13. Neck & Back Pain, Painful Arc Syndrome, Tendinitis, Fascitis & Spasmodic Torticollis, (Outline the above including clinical features and management)

14. Spinal and Other Deformities: Classify spinal deformities and outline the salient clinical features, management and complications of Scoliosis, Kyphosis and Lordosis, Cervical Rib, Common acquired deformities of foot, knee, hip, shoulder, elbow and wrist including hand

15. Congenital Deformities: Outline the clinical features and management of Congenital Talipes Equino Varus (CTEV), Congenital Dislocation of the Hip, Flat foot, vertical talus,

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limb deficiency (radial club hand and femoral, tibial and fibula deficiencies)
meningomyelocele, Arthrogryphosis multiplex congenita and Osteogenesis imperfecta

16. Hand Injuries: Outline of clinical features, management and complications of: Skin and soft tissue injury, tendon injury, bone and joint injury.

Brief review of the above conditions and various physiotherapeutic modalities, aim, means and techniques of physiotherapy should be taught in detail.

Practical

Various physiotherapy modalities and treatment techniques for the above-mentioned conditions to be demonstrated and practiced by the students in clinical setup.

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P.T. in Surgery Including Gynecology and Obstetrics Paper-II

Full Marks: 200

Theory: 100

Practical: 100

Study hours (Theory-100 Hours, Practical- 100 Hours): 200 Hours

TEXT BOOK / REFERENCE BOOKS:

1. Bailey and Love's short practice of Surgery - 27th edition
Sabiston Textbook of surgery - 20th edition

2. Textbook of Physiotherapy in Surgical Conditions Paperback – 1 January 2013
by Mitra

3. PHYSIOTHERAPY IN OBSTETRICS & GYNAECOLOGY by Margaret
Polden (Author), Jill Mantle (Author)

4. Physiotherapy In Pregnancy Antenatal Postnatal And Baby Care
by Hiranandani M.

5. CASH'S TEXTBOOK OF GENERAL MEDICAL & SURGICAL CONDITIONS
FOR PHYSIOTHERAPISTS Paperback
by Joan E. Cash (Author), Patricia A. Downie

1. Investigations and tests – Exercise tolerance Testing – Cardiac & Pulmonary, Radiographs, PFT, ABG, ECG, Hematological and Biochemical Tests. [6 Hours]

2. Physiotherapy techniques to increase lung volume – controlled mobilization, positioning, breathing exercises, Neurophysiological Facilitation of Respiration, Mechanical aids - Incentive Spirometry, CPAP, IPPB. [3 Hours]

3. Physiotherapy techniques to decrease the work of breathing – Measures to optimize the balance between energy supply and demand, positioning, breathing re-education – Breathing control techniques, mechanical aids – IPPB, CPAP, BiPAP. [3 Hours]

4. Physiotherapy techniques to clear secretions – Hydration, Humidification & Nebulisation, Mobilization and Breathing exercises, Postural Drainage, Manual techniques – Percussion, Vibration and Shaking, Rib Springing, ACBT, Autogenic Drainage, Mechanical Aids – PEP, Flutter, IPPB, Facilitation of Cough and Huff, Nasopharyngeal Suctioning. [3 Hours]

Abdominal Surgery & Others

[15 Hours]

Pre and Post Operative Physiotherapy management of following abdominal surgical conditions including incisions, pre and postoperative complications

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- Total Gastrectomy, Partial Gastrectomy
- Appendisectomy
- Cholecystectomy
- Colostomy
- Hernioraphy and Hernioplasty
- Nephrectomy
- Mastectomy and Radical Mastectomy
- Prostatectomy

Cardio thoracic Surgery:

[20 Hours]

Introduction:- Incisions for cardio thoracic surgery, Drainage tubes & bottles.

Ventilators- Classification, Modes of uses and functions, weaning methods, Physiotherapy during ventilator support.

Pre and Post Operative physiotherapy management of pulmonary conditions (Pulmonary Rehabilitation):

- Thoracotomy
- Lobectomy
- Thoracoplasty
- Pneumonectomy

Orientation about atelectasis, pneumothorax, pre and post operative physiotherapy management of cardiac surgery (Cardio Rehabilitation),

- Angiography & Angioplasty
- open-heart surgery
- CABG
- Valve Replacement etc.

Introduction to ICU

[5 Hours]

Acquire knowledge of the overview of patient's care in the I.C.U. for bronchial hygiene and continuous monitoring of the patient in I.C.U.

Plastic Surgery:

[15 Hours]

- Burn and its Physiotherapy management.
- Pre and Postoperative physiotherapy of skin grafting, Skin flaps.
- Physiotherapy of cases after reconstructive surgery.
- Various physiotherapy modalities and treatment techniques for the above mentioned conditions

Management of wound ulcers:

[5 Hours]

- Care of wounds and ulcers
- Care of surgical scars
- Various physiotherapeutic approaches for healing of wounds, prevention of hyper granulated scars, Keloids, scar tissue mobilization.

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Paper – III Physiotherapy in Medical Conditions including Cardio-Pulmonary and Pediatrics

Total teaching hours: 200

Theory Marks: 80+20 & Practical Marks: 80+20

Total marks: 200

COURSE DESCRIPTION: The subject is intended to provide the student an opportunity to learn about different medical conditions in the field of general medicine, cardiology, pulmonology, and Pediatrics in order to rationalize and apply the knowledge gained about various medical conditions in the clinical setup.

COURSE OBJECTIVES: At the end of the course, the student should be able to:

- Know the definition, pathophysiology, features and management of various medical conditions listed in the syllabus

TEXT BOOK / REFERENCE BOOKS:

1. Davidson's Principles and practice of Medicine 22nd edition
2. Tidy's Physiotherapy, 15e
3. CASH'S TEXTBOOK OF GENERAL MEDICAL & SURGICAL CONDITIONS FOR PHYSIOTHERAPISTS

Section I: General Medicine

Review of the Pathological and principles of management by Physiotherapy to the following conditions:

1. Inflammation – acute, chronic and suppurative.
2. Oedema – Traumatic, obstructive, Paralytic, Oedema due to poor muscle and laxity of the fascia.
4. Common conditions of Skin – Acne, Psoriasis, Alopecia, Leucoderma, Leprosy, Sexually transmitted diseases., Scleroderma, Dermatomyositis
5. Deficiency diseases – Anemia, Rickets, Diabetes, Obesity, Osteoporosis and other deficiency disorders related to Physiotherapy.

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6. Carcinoma : Common sites, clinical features, role of Physiotherapy

Section II Respiratory

1. Review of mechanism of normal respiration.
2. Basic principles of respiratory rehab
3. Cardio-respiratory examination, including auscultation, percussion. Various Chest Physiotherapy applications like Postural drainage, ACBT, Autogenic drainage, Breathing exercise.
4. Respiratory devices: Nebuliser, PAP, Spirometer, Ambu bag, Suction, Intubation, Oxygen delivery system, ABG analysis
5. Knowledge of various investigative procedures (invasive and noninvasive) used in the diagnosis of various respiratory disorders.
6. Principles of various therapeutic measures in Critical care unit (ITU,CCU, NICU)
7. Mechanical Ventilation: Indications, types, modes, Weaning strategy, therapeutic application.
8. Cardio Pulmonary Resuscitation: Principles and methods of applications

Review of pathological changes and principle of management by physiotherapy of the following conditions:

- 1) Obstructive disorders: Acute & Chronic Bronchitis, Asthma, Bronchiectasis, Emphysema, COPD, Cystic fibrosis
- 2) Restrictive disorders: Pleurisy, Empyema, Pneumonia, Pneumothorax, Hydrothorax, Hemothorax, Pyothorax.
- 3) Miscellaneous lung disorders: Bacterial Disease, Pulmonary tuberculosis, Lung abscess, Lung carcinoma, ARDS
- 4) Respiratory Failure
- 5) Paralysis of diaphragm and vocal cords.
- 6) Chest wall deformities.

Section III: Cardiovascular

1. Review of anatomy and physiology of the cardiovascular system.
2. Basic principles of Cardio rehab

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3. Knowledge of various investigative procedures (invasive and noninvasive) used in the diagnosis of various cardiovascular disorders.

4. Review of the pathological changes and principle of management by physiotherapy of the following conditions:

Thrombosis, Embolism, Buerger's diseases, MI, Arteriosclerosis, Thrombophlebitis, Phlebitis, Gangrene, Congestive Cardiac failure. Hypertension, Hypotension, aneurysm, Conductive disorders of heart, cardio-myopathy.

Section IV :Paediatrics

A. Review of the examination & assessment of a Pediatric patient.

B. Review of pathological changes and principle of management by physiotherapy of the following conditions. :

- 1) Common congenital heart disease (ASD, VSD, PDA, Fallot's tetralogy, Aortic aneurysm and Coarctation)
- 2) Common nutritional, metabolic and vitamin deficiency disorders: (Rickets, Kwashiorkor)

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4th year PT in Neurology & Neuro surgery Paper-IV

Theory 100 hrs

Practical 100 hrs

COURSE DESCRIPTION: The module is intended to provide the student an opportunity to gain knowledge about various disorders of nervous system. The module helps the student to acquire skills in evaluation, identifying the problems, planning treatment goals and apply various techniques to restore functions based on evidence.

COURSE OBJECTIVES: At the end of the course, the student should be able to:

- Know the assessment, findings and the Physiotherapy management of conditions listed in the syllabus
- Demonstrate evaluation and Physiotherapy treatment techniques in patients with neurological disorders
- Independently assess, identify problems, plan and design treatment methods in patients with neurological disorders

TEXT BOOK / REFERENCE BOOKS:

1. Physical Rehabilitation (5th Edition)- Susan O Sullivan & Thomas J Schmitz
2. Umphred's Neurological Rehabilitation- 6th Edition
3. Cash's Textbook of Neurology for Physiotherapist (4th Edition) – P A Downie
4. Physiotherapy in Neuro-conditions- Gladys Samuel
5. Treatment of Cerebral Palsy and Motor Delay, 5th Edition- Sophie Levitt
6. Pediatric Physical therapy (5th Edition): Jan S tecklin

A. Physiotherapy in Adult Neurology:

1. Neurological assessment, Investigations and outcome measures:
Chief complaints, History taking, Developmental milestones, Developmental reflexes, Higher mental function, Sensory examination, Motor Examination, Special tests, Balance examination, coordination examination, Gait analysis, Functional Analysis. Assessment tools & Scales.
2. Cerebrovascular accidents:
 - General classification, clinical features, gross localization according to involved artery and sequelae, recovery stages, neuroplasticity basis of recovery, treatment goal, approaches and techniques.
3. Multiple sclerosis:

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- Pathophysiology, classification, clinical signs & symptoms, rehabilitation framework and management.
4. Extrapyrarnidal movement disorders(Parkinson's disease, Chorea, Dystonia, Ballism, Athetosis, Tics):
 - Pathophysiology, classification, clinical signs & symptoms, rehabilitation framework and management.
 5. Cerebellar, sensory and congenital ataxia:
 - Classification, clinical signs & symptoms, treatment training.
 6. Infectious diseases of nervous system (Meningitis and Encephalitis, Tuberculous infection, Poliomyelitis, Tabes Dorsalis):
 - Patho-physiology, clinical signs & symptoms, prevention and management of post-infectious sequelae and complications of residual paralysis, orthosis prescription and corrective surgeries.
 7. Peripheral neuropathy -Guillain Barre Syndrome, Acute Inflammatory Demyelinating Polyneuropathy, Chronic Inflammatory Demyelinating Polyneuropathy, Diabetic poly neuropathy:
 - Patho-physiology, clinical signs & symptoms, prevention and management
 8. Disorders of Muscle (Myasthenia gravis, myotonic disorders, Myopathies):
 - Patho-physiology, clinical signs & symptoms, prevention and management
 9. Motor neuron disease (Amyotrophic lateral sclerosis, Progressive bulbar palsy):
 - Etiology, types, assessment & management
 10. Disorders of spinal cord: Spinal tumors, degenerative disc disorders, Abscess, Herniated disc, spinal stenosis, transverse myelitis:
 - Pathophysiology, signs & symptoms, assessments & tests, management.
 11. Nerve injuries: Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic & intercostals nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, and Pudendal nerve palsy, Entrapment neuropathies, Sciatica, Fifth and Seventh nerve palsy:
 - Pathophysiology, signs & symptoms, assessments & tests, management.

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12. Benign Paroxysmal Positional Vertigo:

- Etiology, Signs & Symptoms, Assessment & Management.

B. Physiotherapy in Paediatric Neurology:

High risk infants, Cerebral palsy, Down syndrome, Spina Bifida, Syringomyelia, Hydrocephalus, Microcephalus, ADHD, Autism, Delayed milestones, Muscular dystrophy (DMD & BMD), Meningitis, Encephalitis, HIE.

- Pediatric assessment and therapeutic approaches.

C. Physiotherapy in Psychosomatic disorders:

Psychosis, Dementia, Alzheimer's disease - assessment and therapeutic management.

D. Physiotherapy in Neuro Surgery:

1. Neurosurgical assessment & investigations
2. Brain Injury: Classification, Degree of severity, post-injury sequelae of traumatic brain injury or brain tumor, Types of surgery, Managing altered consciousness, cognitive impairment, complications, management
3. Spinal Cord Injury: Classification, features, Types of spinal & vertebral surgery, complications and management.
4. Peripheral nerve injury: Nerve Grafting, Nerve repair, prehabilitation & rehabilitation

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Paper – V Physiotherapy Ethics, Administration
& Principles of Rehabilitation

Time: 3 Hrs.

Theory: 80+ 20 Int. Assess. =100

Practicals: 80+ 20 Int. Assess. =100

Teaching hours: Theory = 120 Practical's = 100

Course Description: The syllabus is intended to provide the student an opportunity to understand ethics in clinical practice, academics, basic knowledge about orthosis and prosthesis and research. It also provides comprehensive knowledge about community-based rehabilitation and basic administrative aspects of Physiotherapy.

Note: The question paper covering the entire course shall be divided into two sections. Each section to be attempted in a separate answer book and to be evaluated by separate examiners.

Section A:

Question 1: This will consist of Five short answer questions with answer to each question upto five lines in length. All questions will be compulsory. Each question will carry 3 marks total weightage being 15 marks.

Question 2: This will consist of one medium answer question with answer to each question upto three pages in length. One question will be set by the examiner and will be compulsory. This question will consist of 10 marks.

Question 3: This will consist of two long answer questions with answers to each question up to 5 pages in length. Two questions will be set by the examiner and the candidate will be required to attempt one. Each question will carry 15 marks.

Section B:

Same as in Section A.

Section I : Physiotherapy Ethics

20 Hrs

1. History of Physiotherapy.
2. Philosophy and Philosophical statements.
3. Major Ethical principles applied to moral issue in health care.
4. Rules of Professional conduct.
5. Scope of practice.
6. Relationships with patients.
7. Relationships with medical colleagues.
8. Relationships between professionals.
9. Relationships within the profession.
10. Sale of goods.
11. Personnel and professional standards.
12. Professional standard.

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Section II: Physiotherapy Administration 10 Hrs

1. Responsibility and Confidentially.
2. Provision of services and advertising.
3. Professional and government licensing, Accreditation and Education standards.
4. Laws and Legal concepts:
 - Protection from Malpractice claims, Consumer Protection Act
 - Liability and Documentations.

Section III Principles of Rehabilitation

Section III A 20 Hrs

1. RPD Act., Conceptual framework of rehabilitation, roles of rehabilitation team members, definitions and various models of rehabilitation.
2. Epidemiology of disability with an emphasis on locomotor disability, its implications – individual, family, social, economic and the state.
3. Preventive aspects of disability and organizational skills to manage it.
4. Community Based Rehabilitation, Institutional Based Rehabilitation and outreach programmes to rehabilitate persons with disabilities living in rural areas.
5. Statutory provisions, Schemes of assistance to persons with disability.
6. Role of NGOs in the rehabilitation of persons with disabilities.
7. Basic principles of administration and finance including personnel management and budget preparation and procurement etc.

Section – III B 15 Hrs

1. Principles of Orthotics – types, indications, contra-indications, assessment (check out) uses and fitting – region-wise.
2. Fabrication of simple splints and self-help devices for upper and lower extremity – indications and application.
3. Principles of Prosthetics – types, indications, contra-indications, assessment (check out), uses and fitting – upper and lower extremity.
4. Wheel Chairs- prescription, usage advice, and follow-up.

Section III C 10 Hrs

1. Principles and mechanisms of Communication including speech and hearing.
2. Common disorders of speech and hearing – etiogenesis, clinical features, assessment and principles of management.
3. Principles in the management of vocational problems, including the evaluation and vocational goals for people with disability.
4. Principles of rehabilitation Nursing, including the function of Nursing personnel and Nursing practice in rehabilitation.

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Section – III D

10 Hrs

1. Identification, assessment and classification of mentally subnormal.
2. Etiogenesis and principles of management including prevention.
3. Rehabilitation of the mentally subnormal, including vocational training & home education programme.

Section – III E

15 Hrs

1. Definition, scope & importance of Activities of Daily Living (ADLs).
2. The teaching and training of (a) wheel chair activities, (b) bed activities (c) transfer activities (d) Locomotor activities (e) Self care activities, such as toilet, eating, dressing etc.

Section - III F

20 hours

1. **Health programmes in India:** Vector borne disease control programme, National leprosy eradication programme, National tuberculosis programme, National AIDS control programme, National programme for control of blindness, Iodine deficiency disorders (IDD) programme, Universal Immunisation programme, Reproductive and child health programme, National cancer control programme, National mental health programme. National diabetes control programme, National family welfare programme, National sanitation and water supply programme, Minimum needs programme.
2. **Demography and Family Planning:** Demographic cycle, Fertility, Family planning- objectives of national family planning programme and family planning methods, A general idea of advantages and disadvantages of the methods.
3. **Nutrition and Health:** Classification of foods, Nutritional profiles of principal foods, Nutritional problems in public health, Community nutrition programmes.
4. **Environment and Health:** Components of environment, Water and air pollution and public health: Pollution control, Disposal of waste, Medical entomology.
5. **Hospital waste management:** Sources of hospital waste, Health hazards, Waste management.
6. **Disaster Management:** Natural and man-made disasters, Disaster impact and response, Relief phase, Epidemiologic surveillance and disease control, Nutrition, Rehabilitation, Disaster preparedness.
7. **Health:** Characteristics of a mentally healthy person, Types of mental illness, Causes of mental ill-health, Prevention, Mental health services, Alcohol and drug dependence. Emphasis on community aspects of mental health. Role of Physiotherapist in mental health problems such as mental retardation.

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8. **Health Education:** Concepts, aims and objectives, Approaches to health education, Models of health education, Contents of health education, Principles of health education, Practice of health education.
9. **Geriatrics** - Physiology of Aging /degenerative changes-Musculoskeletal /Neuromotor /cardio – respiratory-/Metabolic, Endocrine, Cognitive, Immune systems. Role of Physio Therapy in Hospital-based care, Half-way homes, Residential homes, Meals on wheels etc. Home for the aged, Institution-based Geriatric Rehabilitation. Few conditions:- Alzheimer's disease, Dementia, Parkinson's Disease, Incontinence, Iatrogenic drug reactions, etc. Ethics of Geriatric Rehabilitation

PRACTICALS:

Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

1. Introduction, Identification & Indications for the application of various aids & appliances like common splints, orthotics & prosthetic devices.
2. Visit to some NGO's dealing with persons with disabilities.
3. Learning basic principles of pre-vocational evaluation & occupational therapy.
4. Learning basic principles of vocational training.

TEXTBOOKS:

1. Textbook of Rehabilitation by S Sunder, 3rd edition, Jaypee publications.
2. Physical Rehabilitation by Susan O'sullivan, Thomas J Schmitz, Jaypee Publications.
3. Textbook of Rehabilitation by DeLisa by Elsevier Publication.
4. Bhutkar principles of exercise prescription 2008 Jaypee publication.
5. Physical Medicine & Rehabilitation by Bryan O' Young, Elsevier Publication
6. Rehabilitation Medicine by Howard A Rusk.
7. Rehabilitation Medicine by Joel A De lisa

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