

**Government of NCT of Delhi**  
**Delhi Pharmaceutical Sciences and Research University**  
**Sector-3, Pushp Vihar, New Delhi-17**



## **Syllabus**

**For**

# **Bachelor of Physiotherapy** **(Semester System)** **(2016-2020 & 2017-2021)**

Bachelor of Physiotherapy (BPT)						Evaluation scheme		
Code	Subject / Course Name	W L	WT/ P	Subject Credit	Subject Hours	Intern al	Exter nal	Total
<b>First Semester</b>								
BPT 101	Human Anatomy - I	4	-	4	64	20	80	100
BPT 102	Human Physiology - I	4	-	4	64	20	80	100
BPT 103	Sociology	4	-	4	64	20	80	100
BPT 104	Fundamentals of Biomechanics & Exercise Therapy - I	4	-	4	64	20	80	100
BPT 105	Principles of Bioelectrical modalities-I	4	-	4	64	20	80	100
	<u>Practical</u>							
BPT 101P	Human Anatomy - I	-	4	2	64	20	80	100
BPT 102P	Human Physiology - I	-	4	2	64	20	80	100
BPT 104P	Fundamentals of Biomechanics & Exercise Therapy - I	-	4	2	64	20	80	100
BPT 105P	Principles of Bioelectrical modalities-I	-	4	2	64	20	80	100
	Total	20	16	28	576	180	720	900
<b>Second Semester</b>								
BPT 201	Human Anatomy - II	4	-	4	64	20	80	100
BPT 202	Human Physiology - II	4	-	4	64	20	80	100
BPT 203	Psychology	4	-	4	64	20	80	100
BPT 204	Fundamentals of Biomechanics & Exercise Therapy - II	4	-	4	64	20	80	100
BPT 205	Principles of Bioelectrical modalities - II	4	-	4	64	20	80	100
BPT 206	Biochemistry	4	-	4	64	20	80	100
	<u>Practical</u>							
BPT 201P	Human Anatomy - II	-	4	2	64	20	80	100
BPT 202P	Human Physiology - II	-	4	2	64	20	80	100
BPT 204P	Fundamentals of Biomechanics & Exercise Therapy - II	-	4	2	64	20	80	100

BPT 205P	Principles of Bioelectrical modalities-II	-	4	2	64	20	80	100
	Total	24	16	32	640	200	800	1000

Code	Subject / Course Name	WL	WT/P	Subject Credits	Subject Hour	Internal	External	Total
<b>Third Semester</b>								
BPT 301	Pathology & Microbiology	4	-	4	64	20	80	100
BPT 302	Pharmacology	3	-	3	50	20	80	100
BPT 303	Medicine	3	-	3	50	20	80	100
BPT 304	Exercise Therapy - I	4	-	4	64	20	80	100
BPT 305	Electrotherapy - I	4	-	4	64	20	80	100
	<u>Practical</u>							
BPT 304P	Exercise Therapy - I	-	4	2	64	20	80	100
BPT 305P	Electrotherapy - I	-	4	2	64	20	80	100
BPT 306P	Evaluative Clinical Practice -I	-	4	2	64	Non University Examination		
	Total	18	12	24	484	140	560	700
<b>Fourth Semester</b>								
BPT 401	General Surgery	3	-	3	50	20	80	100
BPT 402	Obstetrics & Gynaecology	2	-	2	32	20	80	100
BPT 403	Exercise Therapy - II	4	-	4	64	20	80	100
BPT 404	Electrotherapy - II	4	-	4	64	20	80	100
BPT 405	Kinesiology & Biomechanics -I	4	-	4	64	20	80	100
BPT 406	Environmental Studies	2	-	2	32	20	80	100
	<u>Practical</u>							
BPT 403P	Exercise Therapy - II	-	4	2	64	20	80	100
BPT 404P	Electrotherapy - II	-	4	2	64	20	80	100
BPT 405P	Kinesiology & Biomechanics -I	-	4	2	64	20	80	100
BPT 407P	Computer Application	-	2	1	32	Non University Examination		
BPT 408P	Evaluative Clinical Practice –II	-	4	2	64	Non University Examination		

	Total	19	18	28	594	180	720	900
--	-------	----	----	----	-----	-----	-----	-----

Subject Code	Subject	Teaching/Week		Credits	Total credit hours	Examination (Marks)			
		Th	Pr			Internal	External	Total	
<b>Fifth Semester</b>									
<i>Theory</i>									
BPT 501	Clinical Orthopaedics-I	3	-	3	48	20	80	100	
BPT 502	Physiotherapy in Orthopaedics-I	4	-	4	64	20	80	100	
BPT 503	Physiotherapy in General Medical & Surgical conditions-I	4	-	4	64	20	80	100	
BPT 504	Research Methodology & Biostatistics -I	3	-	3	48	20	80	100	
BPT 505	Kinesiology & Biomechanics -II	4		4	64	20	80	100	
BPT 506	First Aid & Basic Nursing	2		2	32	Non University			
<i>Practical</i>									
BPT 501P	Clinical Orthopaedics-I	-	2	1	32	10	40	50	
BPT 502P	Physiotherapy in Orthopaedics-I	-	4	2	64	20	80	100	
BPT 503P	Physiotherapy in General Medical & Surgical conditions-I		2	1	32	20	80	100	
BPT 505P	Kinesiology & Biomechanics -II		2	1	32	20	80	100	
Clinical Training Hours (3hrs/day X 80days)									
	Total		20	10	25	480	170	680	850
<b>Sixth Semester</b>									
<i>Theory</i>									
BPT 601	Clinical Orthopaedics-II	3	-	3	48	20	80	100	
BPT 602	Physiotherapy in Orthopaedics-II	4	-	4	64	20	80	100	
BPT 603	Physiotherapy in General Medical & Surgical conditions-II	4	-	4	64	20	80	100	
BPT 604	Research Methodology & Biostatistics -II	3		3	48	20	80	100	
BPT 605	Professional Ethics & Administration	3		3	48	10	40	50	
BPT 606	Clinical Cardiothoracic Conditions	3		3	48	20	80	100	
BPT 607	Radiology & Radiodiagnosis	1		1	16	Non-University			
<i>Practical</i>									
BPT 601P	Clinical Orthopaedics-II	-	2	1	32	10	40	50	
BPT 602P	Physiotherapy in Orthopaedics-II	-	4	2	64	20	80	100	

BPT 603P	Physiotherapy in General Medical & Surgical conditions-II		2	1	32	20	80	100
BPT 606P	Clinical Cardiothoracic Conditions		2	1	32	20	80	100
Clinical Training Hours (3hrs/day X 80days)								
	Total	21	10	26	496	180	720	900

Subject Code	Subject	Teaching /Week		Credits	Total credit hours	Examination (Marks)		
		Th	Pr			Internal	External	Total
<b>Seventh Semester</b>								
<i>Theory</i>								
BPT 701	Clinical Neurology & Neurosurgery-I	3	-	3	48	20	80	100
BPT 702	Physiotherapy in Neurological Conditions -I	4	-	4	64	20	80	100
BPT 703	Physiotherapy In Cardiothoracic & Cardiopulmonary Conditions-I	4	-	4	64	20	80	100
BPT 704	Physiotherapy In Sports-I	3	-	3	48	20	80	100
BPT 705	Community based Rehabilitation & Bioengineering-I	2	-	2	32	20	80	100
<i>Practical</i>								
BPT 701P	Clinical Neurology & Neurosurgery -I	-	2	1	32	10	40	50
BPT 702P	Physiotherapy in Neurological Conditions-I	-	4	2	64	20	80	100
BPT 703P	Physiotherapy In Cardiothoracic & Cardiopulmonary Conditions-I	-	2	1	32	20	80	100
BPT 704P	Physiotherapy In Sports-I	-	2	1	32	20	80	100
BPT 705P	Community based Rehabilitation & Bioengineering -I		2	1	32	20	80	100
Clinical Training Hours (3hrs/day X 80days)								
	Total	16	12	22	448	190	760	950
<b>Eighth Semester</b>								
<i>Theory</i>								
BPT 801	Clinical Neurology & Neurosurgery-II	3	-	3	48	20	80	100
BPT 802	Physiotherapy in Neurological Conditions –II	4	-	4	64	20	80	100
BPT 803	Physiotherapy In Cardiothoracic & Cardiopulmonary Conditions-II	4	-	4	64	20	80	100
BPT 804	Physiotherapy In Sports-II	3	-	3	48	20	80	100
BPT 805	Community based Rehabilitation	2	-	2	32	20	80	100

	& Bioengineering -II							
BPT 806	Project Work	-	-	-	-	20	80	100
<b>Practical</b>								
BPT 801P	Clinical Neurology & Neurosurgery –II	-	2	1	32	10	40	50
BPT 802P	Physiotherapy in Neurological Conditions-II	-	4	2	64	20	80	100
BPT 803P	Physiotherapy In Cardiothoracic & Cardiopulmonary Conditions-II	-	2	1	32	20	80	100
BPT 804P	Physiotherapy In Sports-II	-	2	1	32	20	80	100
BPT 805P	Community based Rehabilitation & Bioengineering -II		2	1	32	20	80	100
Clinical Training Hours (3hrs/day X 80days)								
	Total	16	12	22	448	210	840	1050

Subject Code	Subject	Teaching/Week		Credits	Total credit hours	Examination (Marks)		
		Th	Pr			Internal	External	Total
<b>Ninth Semester</b>								
BPT 901	Rotatory Internship	---	928	29	928	(8hrs/day X 152Days)		
BPT 902	Internship project		288	9	288			
	Total		1216	38	1216			

**First Semester  
Human Anatomy – I**

**Subject code: BPT 101**

**Course objectives:**

Understanding of gross anatomy of various body parts.

Application of knowledge of anatomy to learn evaluation and application of physical therapy.

Major emphasis of learning is towards Musculo-skeletal, cardio-respiratory and nervous system.

**Module 1. General Anatomy:**

- Introduction to Anatomy, terms and terminology
- Regions of Body, cavities and Systems outline.
- Surface anatomy – nerve, muscle, skeleton, major blood vessels and cardiopulmonary
- Cell Structure and function of cell organelles (Brief outline only).
- Connective tissue & its modification, tendons, membranes, cartilage,.
- Bone structure, blood supply, growth, ossification, and classification.
- Muscle classification, structure and functional aspect.
- Nerve – structure, classification, microscopy with examples.
- Neurons, classification with examples. Simple reflex arc.
- Parts of a typical spinal curve/Dermatome
- Skin and skin appendages
- Joints – classification, structures of joints, movements, range, limiting factors, stability, blood supply, nerve supply, dislocations and applied anatomy.
- Circulatory system – major arteries and veins of the body, structure of blood vessels
- Lymphoid system – circulation + function, lymphoid organs- and their structure & functions.

**Module 2. Upper extremity:**

- Osteology (Clavicle, scapula, humerus, radius, ulna, carpals, metacarpals, phalanges)
- Joints – structure, range of movement
- Soft Parts- Brest, Pectoral Region, Axilla, Front of the arm, back of the arm, cubital fossa, front fore arm, back of fore arm, palm and dorsam of hand.
- Muscles – origin, insertion, actions, nerve supply
- Major nerves – course, branches and implications of nerve injuries
- Major vessels – course and implications of pathological event
- Development of limb bones, muscles and anomalies
- Arches of the Hand, skin of palm, and dorsum of the hand
- Radiographic identification of bone and joints

**Module 3. Lower Extremity:**

- Osteology ( Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges)
- Joints – structure, range of movement

- Soft parts- Gluteal region, front & back of the thigh( femoral triangle, femoral canal, and inguinal canal), medial side of the thigh(adductor canal), lateral side of the thigh, popliteal fossa, anterior & posterior compartment of the leg, sole of the foot
- Muscles – origin, insertion, actions, nerve supply
- Major nerves – course, branches and implications of nerve injuries
- Major vessels – course and implications of pathological event
- Development of limb bones, muscles and anomalies
- Arches of foot, skin of the foot
- Radiographic identification of bone and joints

**Text & References:**

- Handbook of General Anatomy, Dr. B.D. Chaurasia
- Colour Atlas of Anatomy, a Photographic study of the Human Body, Roben, Johanneswetal
- Gray's Anatomy, M. Berry, Lawrence H. Bannister
- Text Book of Anatomy (3 vol.), B.D. Chaurasia
- Textbook of Anatomy by Inderbir Singh; 4th edition; Jaypee Publications

**First Semester  
Human Physiology – I**

**Subject code: BPT 102**

**Course objectives:**

- To understand the Physiological functions of human body
- To understand the application of physiological functions & physiology of exercise in relation to physical therapy
- Major area of learning is cardio-respiratory, Musculo-skeletal and nervous system.

**Module 1. General Physiology**

- Cell: Morphology. Organelles: their structure and functions
- Transport Mechanisms across the cell membrane
- Body fluids: Distribution, composition.
- Homeostasis

**Module 2. Nerve**

- Nerve cell – structure
- Genesis of membrane potential, Action potential & propagation
- Ionic basis of nerve conduction
- Classification & types of nerve fiber
- Mixed nerves & compound action potential
- Concept of nerve injury, degeneration and regeneration

**Module 3. Muscle**

- Types and morphology, mechanism of muscle contraction, EC coupling
- Muscle properties and functions
- Electrical & Mechanical responses & their basis
- Concept of isometric & isotonic muscle contraction
- Neuromuscular junction, structure & events occurring during excitation-contraction coupling
- Myasthenia gravis, rigormortis,

**Module 4. Synaptic & Junction Transmission**

- Basic synaptic anatomy
- Synaptic activity, Chemical transmission
- Inhibition & facilitation
- Principal neurotransmitter system

## **Module 5. Blood**

- Introduction: Composition and functions of blood.
- Plasma: Composition, formation, functions. Plasma proteins, Starling Forces & formation of oedema
- W.B.C., R.B.C., Platelets formation & functions
- Haemoglobin –structure, function and derivatives Anemia (in detail), types of Jaundice. Blood indices, PCV, ESR.
- Blood Groups, Erythroblastosis foetalis
- Hemostasis, Immunity

## **Module 6. Cardiovascular System**

- Introduction: Physiological anatomy and nerve supply of the heart and blood vessels. Organisation of CVS. Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential. Properties.
- Anatomical, biophysical consideration of arterial, capillary, venous and Lymphatic circulation
- Arterial Blood Pressure: Definition. Normal values and its variations. Determinants. Peripheral resistance. Regulation of BP.
- Basic idea of Electrocardiogram
- Mechanical events of Cardiac cycle, Cardiac output, its regulation
- Local & systemic regulatory mechanisms of CVS, humeral & neural
- Lymph: Composition, formation, circulation and functions
- Cerebral, coronary, splanchnic, skin, Hepatic

## **Text & References:**

- Manual of Practical Physiology, A.K. Jain
- Review of Medical Physiology, Ganong
- Text Book of Medical Physiology, Guyton, Arthur C & John E. Hall
- A text book for Medical students, R.L. Bijlani

**First Semester  
Sociology**

**Subject code: BPT 103**

**Course Objectives:**

To understand sociological aspects in health and disease

To understand sociological impact of disability and measures to address adverse situations

**Module 1.** Definition and scope of Sociology

- Its relation with Anthropology, Psychology, Social Psychology and ethics
- Methods of Sociology-case study, Social Survey, Questionnaire, interview and opinion poll methods
- Importance of its study with special reference to health care professionals
- Social Factors in Health and Disease
- Socialization - Meaning and nature, Primary, Secondary, and Anticipatory Socialization and Agencies of Socialization
- Social Groups – Concept, influence of formal and informal groups on health and sickness and role of groups in the hospital and rehabilitation settings

**Module 2.**

- Family - Meaning and definition, Functions, family Patterns, influence of family on the individual health, family, and nutrition, effects of sickness on family and psychosomatic disease and their importance to Physiotherapy
- Community – (Rural community & Urban community – Meaning and features and health hazards)

**Module 3.**

- Culture and Health – Concept, cultures and behavior, cultural meaning of sickness and culture and health disorders
- Social change - Meaning & Factors of social change
- Human adaptation and social change, Social change and stress, deviance, and health Program,
- The role of social planning in the improvement of health and in rehabilitation

**Module 4.**

- Social problems of disabled - Consequences of the social problems in relation to sickness and disability, remedies to prevent these problems
- Population explosion, Poverty and unemployment, Beggary, Juvenile delinquency, Prostitution, Alcoholism,
- Problems of women in employment
- **Module 5.** Social Stratification- caste, class, gender
- Social security - Social security and social legislation in relation to the disabled

- Social worker - Meaning of social work; the role of a medical social worker

**Text & References:**

- Sociology for Physiotherapists by Dibyendunarayana Bid, 1st edition, Jaypee Publication.
- Introduction to Sociology, Vidya Bhusan & DP Sachdeva
- An introduction to sociology by - Sachdeva and Bhushan, 32nd Edition, Kitab Mahal Publication.
- Textbook of Sociology for Physiotherapy Students by KP Neeraja, 1st Edition, Jaypee Publication

**First Semester**  
**Fundamental of Biomechanics and Exercise Therapy – I**

**Subject code: BPT 104**

**Course Objectives:**

- This course will enable the student to understand the basic principles of biomechanics
- To understand basic principles of exercise therapy and its effects

**Module 1. Mechanics - Definition of mechanics and Biomechanics**

- Force - Definition, diagrammatic representation, classification of forces, concurrent, coplanar and co-linear forces, composition and resolution of forces, angle of pulls of muscle
- Momentum - principles, and practical application
- Friction

**Module 2. Equilibrium - Supporting base, types, and equilibrium in static and dynamic state**

- Gravity - Definition, line of gravity, Centre of gravity
- Energy work and power

**Module 3. Levers - Definition, function, classification**

- Order of levers with example of lever in human body
- Application of levers in physiotherapy
- Pulleys - system of pulleys, types and application

**Module 4. Elasticity - Definition, stress, strain, HOOKE'S Law**

- Springs - properties of springs, springs in series and parallel
- Elastic materials in use

**Module 5. Aims and scope of various biomechanical modalities**

- Shoulder wheel, shoulder ladder, shoulder pulleys
- Pronator-supinator instrument
- Static cycle, rowing machine
- Ankle exerciser, balancing board
- Tension springs, bands and weights

**Text & References:**

- The Principles of Exercise Therapy, Dena Gardiner
- Practical Exercise Therapy, Hollis, Margaret & cook

- Therapeutics Exercise (Foundation & Technique), Colby & Kisner

**First Semester  
Principles of Bioelectrical Modalities – I**

**Subject code: BPT 105**

**Course Objectives:**

- This course will enable the student to understand the basic electricity & electronics
- To understand electrical and electronic equipment for use in physiotherapy
- Application of electrical and electronic equipment in Electrotherapy
- All topics are for a brief description only

**Module 1. Fundamentals of Electricity**

- DC Currents - Modern concept of electricity: fundamental electric charges (proton and electron), bound and free electrons, free electrons and current, static electric charge, charging of an object potential and capacitance, potential difference and EMF
- AC currents - Sinusoidal wave form, frequency, wavelength, Amplitude and phase of a sine wave, Average & RMS value of a sine wave
- Quantity of electricity, magnitude of current, conductors and insulators, resistance of conductor and Ohm's law, resistances in series and parallel

**Module 2.**

- Capacitors - Electric field around a capacitor, charging and discharging a capacitor, types of capacitor with application of each in Physiotherapy department
- Rheostat - series and shunt Rheostat with application of each in the Physiotherapy department

**Module 3.**

- Effects of electric Current - Thermal effect, chemical effect (ionization) and magnetic effect. Electric shock, Earth shock, causes and its prevention

**Module 4. Thermionic Valves:**

- Thermionic emission, Diode and Triode valves and their characteristics, Construction and application of Cathode Ray Oscilloscope
- Semiconductor Devices: Intrinsic and extrinsic semiconductors, advantages of diode and transistors devices. Basing of Diode and their characteristics, Light Emitting Diodes, integrated circuits

**Module 5.**

- Electronic Circuits: Rectifiers & smoothing circuits, Oscillators - Sinusoidal and non-sinusoidal types

- A.C. AND D.C. meters: Functions and applications of Ammeter and volt meters, Ohmmeters, Wheat stone bridge

### **Module 6. Magnetism**

- Magnetic - non-magnetic substances and their properties
- Properties of magnet, molecular theory, poles of magnet and its properties
- Magnetic lines of force and their properties
- Electromagnetism, magnetic effects of electric current
- Electromagnetic induction, Lenz's law
- Inductor and Inductance types of inductor, reactance and impedance

### **Module 7. Physical Energy**

- 
- Heat and electromagnetic radiations
- Types, physiological effects and dangers in their application

### **Text & References:**

- Evidence Based Practice (Clayton's electrotherapy), Foster & Palastanga
- Electrotherapy Explained, Low & Reed
- Clinical Electrotherapy, Nelson & Currier

**Second Semester  
Human Anatomy – II**

**Subject code: BPT 201**

**Course objectives:**

- Understanding of gross anatomy of various body parts.
- Application of knowledge of anatomy to learn evaluation and application of physical therapy.
- Major emphasis of learning is towards Musculo-skeletal, cardio-respiratory and nervous system.

**Module 1. Spine:**

- Back muscles - Superficial layer, Deep muscles of back, their origin, insertion, action and nerve supply.
- Vertebral column – Structure & Development, Structure & Joints of vertebra
- Radiographic identification of bone and joints

**Module 2. Thorax:**

- Thoracic cage, Pleural cavities & pleura
- Lungs and respiratory tree
- Heart and great vessels
- Diaphragm

**Module 3. Neural anatomy:**

- Mandible and bones of the skull.
- Muscles of the face and neck and their nerve and blood supply-extra ocular muscles, triangles of the neck Central nervous system – disposition, parts and functions of
- Cerebrum, Cerebellum, Midbrain & brain stem
- Blood supply & anatomy of strokes (Circle of Willis)
- Spinal cord- anatomy, blood supply, nerve pathways
- Pyramidal, extra pyramidal system
- Development of nervous system & defects (Brief Description)
- Cranial nerves – special emphasis on V, VII, X, XI, XII (course, distribution and palsies)
- Peripheral nerves
- Sympathetic nervous system, its parts and components
- Parasympathetic nervous system.

**Module 4. Miscellaneous:**

- Embryology in brief covering neuromuscular developmental aspect, Fetal & placental circulations
- Endocrine - system – Pituitary, Thyroid, parathyroid (Brief Description)
- Special senses (Brief Description): Nerve receptors, Eye, Ear, Labyrinth, Nose, Tongue

- Abdomen and pelvis (Brief descriptions only):
- Abdominal cavity – divisions
- Muscles of abdominal wall, pelvic floor, innervations
- Bony Pelvis
- Digestive system (Liver & pancreas, Alimentary canal)
- Urinary system – Kidney, Ureter, bladder, urethra
- Genital system – male and female
  
- **Text & References:**
- Handbook of General Anatomy, Dr. B.D. Chaurasia
- Colour Atlas of Anatomy, a Photographic study of the Human Body, Roben, Johanneswetal

**Second Semester  
Human Physiology – II**

**Subject code: BPT 202**

**Course objectives:**

- To understand the Physiological functions of human body
- To understand the application of physiological functions & physiology of exercise in relation to physical therapy
- Major area of learning is cardio-respiratory, Musculo-skeletal and nervous system.

**Module 1. Respiratory System**

- Physiological anatomy of lungs, mechanics of respiration
- Pulmonary circulation, Gas exchange in lungs
- Oxygen & Carbon dioxide transport
- Neural & chemical control of breathing
- Regulation of respiratory activity

**Module 2. Cardio respiratory adjustments in health & disease**

- Exercise, high altitude
- Hypoxia, Dyspnoea, Apnoea, hypercapnia, periodic breathing, oxygen treatment
- Asthma, emphysema, artificial respiration

**Module 3. Functions of Nervous system (descriptive)**

- Reflexes, monosynaptic, polysynaptic, withdrawal reflex & Properties
- Sense organ, receptors, electrical & chemical events in receptors
- Sensory pathways for touch, temperature, pain, proprioception, others
- Control of tone & posture: Integration at spinal, brain stem, cerebellar, basal ganglion levels, along with their functions & clinical aspects
- Autonomic nervous system & Hypothalamus
- Higher functions of nervous system
- Learning & memory, neocortex,
- Limbic functions, sexual behavior, fear & range, motivation

**Module 4. Miscellaneous**

- Special senses (vision, audition, smell, taste)
- Endocrinology (pituitary, thyroid, parathyroid, adrenal, pancreas)
- Male & female reproductive system

## **Module 5. Digestive System**

- Digestion & absorption of nutrients
- Gastrointestinal secretions & their regulation
- Liver & Exocrine Pancreas

## **Module 6. Renal System**

- Nephrons – cortical and juxtamedullary. Juxta-glomerular apparatus. Glomerular membrane. Renal blood flow and its regulation. Functions of kidneys.
- Mechanism of glomerular filtration. GFR – normal value and factors affecting.
- Clearance (renal, insulin, creatinine), Tubular reabsorption & secretion
- Water excretion, concentration of urine-regulation of Na, Cl, K excretion
- Physiology of urinary bladder

## **Text & References:**

- Manual of Practical Physiology, A.K. Jain
- Review of Medical Physiology, Ganong
- Text Book of Medical Physiology, Guyton, Arthur C & John E. Hall

**Second Semester  
Psychology**

**Subject code: BPT 203**

**Course Objectives:**

- This course will enable the student to understand specific psychological factors and effects in physical illness and this will help them to have a holistic approach in their dealings with patients during admission, treatment, rehabilitation and discharge.

**Module 1.**

- Definition, application of psychology, influence of heredity and environment on the individual
- Learning – theories & principles learning
- Memory, theories of memory and forgetting, thinking & methods to improve memory
- Thinking – process, problem solving, decision making and creative thinking

**Module 2.**

- Motivation - theories and types of Motivation
- Emotions - theories of Emotions and stress
- Attitudes – theories, attitudes and behavior, factors in attitude change
- Intelligence - theories of intelligence

**Module 3.**

- Personality, theories of personality, factors influencing personality
- Development and growth of behavior in infancy and childhood, adolescence, adulthood and old age
- Behavior - normal and abnormal

**Module 4.**

- Counseling - Definition, Aims and principles
- Psychotherapy – brief introduction to paradigms in psychopathology and therapy
- Psychological need of children and geriatric patients
- Communication – effective and faulty

**Module 5.**

- Psychological disorders
- Anxiety Disorders
- Eating disorders
- Somatoform and Dissociate Disorders
- Personality Disorder

- Stress and health
- Severe psychological disorders – Mood disorders, psychosis
- Mental deficiency - Mental retardation, Learning disabilities & Autistic behavior

**Text & References:**

- Hilgard's Introduction to Psychology, Atkinson, Rital et al
- Introduction to Psychology, Margan, Cliffer T. et al
- Health Psychology, Howard S.Friedman & M. Robin Diamatteo
- Social Psychology, Baron, Robertj A. & Donn Byrine

**Second Semester**  
**Fundamental of Biomechanics and Exercise Therapy – II**  
**Subject code: BPT 204**

**Course Objectives:**

- This course will enable the student to understand the basic principles of biomechanics
- To understand basic principles of exercise therapy and its effects

**Module 1. Movements - Anatomical definition and description**

- Movements and exercise as therapeutic modality and their effects
- Physiological reaction of exercise
- Starting positions - Description and muscle work
- Importance of fundamental and derived types
- Effects and uses of individual positions

**Module 2. Hydrostatics and Hydrodynamics:**

- Properties of water, Specific gravity, Hydrostatic pressure
- Archimedes principle, Buoyancy-law of floatation
- Effect of buoyancy on movements performed in water
- Equilibrium of a floating body, Bernoulli's theorem
- Physiological effects of exercise in water

**Module 3. Hydrotherapy:**

- Indication, contraindication
- Benefits of hydrotherapy
- Dangers and precautions
- Hydrotherapy regimes of exercises
- Types of pools and baths

**Module 4. Suspension Therapy:**

- Principles of suspension & types
- Components of suspension apparatus
- Effects and uses & therapeutic application

**Module 5. Soft tissue manipulation:**

- History, definition, types and their rationale
- General effects, local effects of individual manipulation (physiological effects)
- Uses, contra-indications

- Techniques of application and safety

**Text & References:**

- The Principles of Exercise Therapy, Dena Gardiner
- Practical Exercise Therapy, Hollis, Margaret & Phylfletcher cook\
- Therapeutics Exercise (Foundation & Technique), Colby & Kisner
- Tidy's Physiotherapy, Thomson Eal

**Second Semester**  
**Principles of Bioelectrical modalities – II**

**Subject code: BPT 205**

**Course Objectives:**

This course will enable the student to understand the basic electricity & electronics  
To understand electrical and electronic equipment for use in physiotherapy  
Application of electrical and electronic equipment in Electrotherapy  
All topics are for a brief description only

**Module 1. Introduction to Therapeutic Energies**

- Thermal,
- Mechanical,
- Electrical
- Electromagnetic and magnetic
- Definition, description, physiological effects, pathological effects and dangers of use of these energies

**Module 2. Medical Instrumentation for Physical Therapy**

- Brief description of generation, circuit diagrams and testing
- Low frequency currents, Direct currents, Medium frequency currents
- Muscle stimulator
- Short wave Diathermy-continuous and pulsed
- Microwave Diathermy
- Ultrasound
- Electromagnetic light radiations (Actino-therapy) - Infrared, UVR and Lasers

**Module 3.**

- Physiological effects, pathological effects and dangers of use of
- Paraffin wax bath
- Hydro-collator (hot packs)
- Cryotherapy
- Steam bath

**Note: emphasis is given only to generation circuit diagram and testing of the various electrotherapy apparatus.**

**Text & References:**

- Evidence Based Practice (Clayton's electrotherapy), Foster & Palastanga
- Electrotherapy Explained, Low & Reed
- Clinical Electrotherapy, Nelson & Currier

## Second Semester Biochemistry

Subject code: BPT 206

### Course Objectives:

To understand biochemical basis of life sciences

Note: A brief description of metabolic pathways mentioned herein is indicated.

Details and structures are to be avoided.

### **Module 1. Nutrition:**

- Basic principles of nutrition; Carbohydrates, Proteins and Lipid caloric requirement and balance diet.
- Carbohydrates: Definition, classification with examples and general functions
- Metabolism - Glycolysis, Glycogen metabolism
- Blood Sugar regulation, Diabetes and diabetic keto-acidosis
- Lipids: Definition, classifications and general functions
- Essential fatty acids, cholesterol, Blood lipids and dyslipidemia
- Metabolism-Oxidation of fatty acids, cholesterol synthesis and fatty liver
- Proteins: Definition, classification and Bio-medical Importance

### **Module 2.**

- Study of hemoglobin and immunoglobulins with functions.
- Plasma Proteins and functions
- Metabolism: General reactions of amino acids
- Formation and fate of ammonia - Urea cycle

### **Module 3. Tissue chemistry:**

- Chemistry of connective tissue, bone and teeth
- Composition function and chemical mediators of nerve structure of muscle tissue
- General Biochemistry of muscle contraction and relaxation

### **Module 4. Enzymes:**

- Definition, classification with examples
- Factors affecting enzyme action, enzyme inhibition and clinical importance of enzymes
- Vitamins: Definition, classification and functions
- Dietary source, Daily requirement and vitamin deficiency disorders
- Water and Electrolyte Balance: General outline of fluid compartments of the body with their water and electrolyte content and balance, Dehydration.

### Text & References:

- Biochemistry for students, V.K. Malhotra
- Text Book of Medical Biochemistry, Chatterjee F. Shinde
- Harper's Illustrated Biochemistry, Murray, Rober K, Granner Daryl
- W. Redwell, K.P. Mayes, Peter A & Victor

**First and Second Semester  
Human Anatomy – I & II**

**PRACTICAL**

- Learning of surface landmarks with special emphasis on bones, joints, muscles, major blood vessels and nerves
- Learning of anatomy is by demonstration only through dissected parts, slides, models, charts, etc.
- Demonstration of dissected parts (upper extremity, lower extremity, thoracic& abdominal viscera, face and brain)
- Demonstration of skeleton articulated and disarticulated
- During the training more emphasis will be given on the study of bones, muscles, joints, nerve supply of the limbs.

**PRACTICAL EXAMINATION**

Students will be examined by viva only based upon learning in theory, demonstration of bones, and joints, muscles, nerves and major viscera.

**First and Second Semester  
Human Physiology – I & II**

**PRACTICAL**

- Examination of pulse, Blood pressure recording
- Examination of respiratory rate
- Measure study the effect of posture & exercise on pulse rate, blood pressure and respiratory rate
- Learning of lung volumes and capacities
- Spirometry to measure various lung capacities & volumes, tidal volume, VC, timed VC, IRV, IC, ERV, EC on Spirometry (demonstration only)
- Demonstration of estimation of Hemoglobin, R.B.C., W.B.C. count (demonstration only)
- Demonstration of Blood indices, Blood grouping, Bleeding & Clotting time (demonstration only)
- Learning of muscle contractions and demonstration of muscle fatigue
- Learning of peripheral motor, sensory and reflex testing

**PRACTICAL EXAMINATION**

Students will be assessed by viva based upon learning in theory

Demonstration of measurements of pulse, blood pressure

**First and Second Semester  
Fundamental of Biomechanics & Exercise Therapy – I & II**

**PRACTICAL**

- Demonstration of Biomechanical principles and exercise therapy
- Study of structure, function, usage and application of various Biomechanical modalities
- Shoulder wheel, shoulder ladder, shoulder pulleys
- Pronator-supinator instrument
- Exercise cycles - static cycle
- Rowing machine
- Ankle exerciser, balancing board
- Springs, tension bands, weights
- Hydrotherapy equipment
- Suspension equipment and components
- Study of structure, function and application of suspensions
- Demonstration and practice of starting and derived positions
- Demonstration and practice of soft tissue manipulation

**PRACTICAL EXAMINATION**

Students will be assessed by viva based upon learning in theory, demonstrations of various biomechanical modalities, suspensions, and manipulative techniques learned.

Students will be assessed by viva based upon learning in theory and demonstration of various components of the equipment.

**First and Second Semester  
Principles of Bioelectrical Modalities – I & II**

**PRACTICAL**

- Demonstration of Bioelectrical principles
- Demonstration of electrotherapy instruments used in physiotherapy, principles of their functioning, usage and safety implications for human beings
- Heat therapy – wax bath, hydro-collator, steam bath, cold pack
- Deep heat therapy – short wave and microwave diathermy
- Ultrasound therapy
- Light therapy – infra red, ultraviolet, lasers
- Therapeutic currents
- TENS, Interferential therapy, muscle stimulator

**PRACTICAL EXAMINATION**

Students will be assessed by viva based upon learning in theory and demonstration of various components and usage of the equipment.

**Third Semester  
Pathology & Microbiology**

**Subject code: BPT 301**

**Course objectives:**

Rationale for understanding of the subject for Physiotherapy students

Brief concept of pathological basis of disease and infectious disease prevention

**Module 1. General Pathology & Microbiology**

- Inflammation, injury and repair
- Infectious diseases: Brief description of classification of microorganisms, identification, Sterilization and disinfections with special reference to principles of antisepsis and prevention of communicable diseases in clinical practice
- Immunology: Brief description of immune system, immunity, immune responses & immune deficiency Immunology, Hypersensitivity disorders
- Oncology: Classification, gross pathological state, cancer pain syndrome (Brief description)

**Module 2. Infections and systemic pathology**

- Brief description of identification of infectious diseases
- Principles of prevention of infectious diseases caused by common pathogens
- (pathogens – streptococci, staphylococci, gonococci, Meningococci, salmonella, V. cholerae, E. coli, shigella, tetanus, Diphtheria, M. leprae, M. tuberculosis, Poliomyelitis, Rabies, Malaria, Amoebiasis, Helminthiasis, Scabies, ringworm, candidiasis)

**Module 3.**

- Skin: Etio-pathogenesis, gross pathology of commonly occurring skin Diseases, Burns, Pressure ulcers (Brief description)
- Haematology: (Brief description) – Etio-pathogenesis, gross pathology of conditions- anaemia, polycythaemia, leukaemia and haemophilia

**Module 4.**

- Cardiovascular system (Brief description): Etio-pathogenesis, gross pathology of conditions – IHD, MI, CCF, RHD, Congenital heart disease, Arteriosclerosis, Vasomotor-Raynaud's, venous thrombosis, Gangrene, Lymph edema
- Respiratory system (Brief description): Etio-pathogenesis, gross pathology of conditions – Pneumonia, Pulmonary TB, Bronchiectasis, COPD, Bronchial Asthma, Restrictive Lung disease, Occupational lung disease

**Module 5.**

- Musculoskeletal system: Etio-pathogenesis, gross pathology of conditions – osteomalacia, Osteoporosis, Osteomyelitis, Osteoarthritis, rheumatoid arthritis, Gout, Osteonecrosis. Biological responses to trauma, bone and soft tissue immobilization
- CNS AND PNS: Etio-pathogenesis, gross pathology of conditions – Meningitis, Encephalitis, Parkinson's, Amyotrophic lateral sclerosis, Multiple Sclerosis, stroke, Neuropathies (Carcoat Marie Tooth's disease, Compression and entrapments, diabetic, G.B syndrome), Myasthenia Gravis

**Text Reading:**

- Robbin's Basic Pathology, Kumar Vijay & Cotron
- Robbin's Pathology with CD Rom(E), Ennaneul Robin et at

## **Third Semester Pharmacology**

**Subject code: BPT 302**

### **Course Objectives:**

To understand pharmaco-kinetics, pharmaco-dynamics

Usage of common drugs with (indications, contraindications, side effects)

To understand the drug actions that may affect the physical therapy treatment

### **Module 1. General Pharmacology:**

- Introduction & general concepts,
- Pharmaco-kinetics (routes of administration, metabolism & elimination)
- Pharmaco-dynamics (mechanism of drug action, therapeutic & side effects, toxicity)

### **Module 2. Autonomic & Central Nervous System:**

- Brief outline of Sympathetic-parasympathetic nervous system - therapeutic agents their uses, therapeutic & side effects and interaction with physical therapy
- Uses, therapeutic & side effects and interaction with physical therapy of the following therapeutic agents:
  - Anesthetic agents, Sedatives and hypnotics,
  - Anti-epileptic drugs, Analgesics,
  - Anti-inflammatory drugs, Psychotherapeutic agents,
  - Movement disorders, Alcoholism and drug dependence

### **Module 3. Cardio-vascular System:**

- Therapeutic agents / drugs used in cardiac failure, hypertension & arrhythmias, vascular disease & ischemia and their therapeutic & side effects, interaction with physical therapy
- Respiratory system:
  - Therapeutic agents / drugs used in respiratory conditions like asthma, therapeutic & side effects and interaction with physical therapy

### **Module 4. Miscellaneous systems:**

- Therapeutic agents / drugs used in Peptic ulcer, Diarrhea, therapeutic & side effects
- Endocrinal hormones: Thyroid, adrenal, parathyroid hormones – uses, therapeutic & side effects
- Diabetes mellitus: Drug therapy therapeutic & side effects and its interaction with physical therapy
- Geriatrics: Pharmacological challenges in geriatric age group and its effects on physical therapy

### **Text Reading:**

- Essentials of Medical Pharmacology, K.D. Tripathi
- Pharmacology & Pharmacotherapeutics, Satokar, R.S. et al

## Third Semester Medicine

Subject code: BPT 303

### Course Objectives:

To understand the subject of medicine, the medical patient & implications of medical condition in physical therapy

#### Module 1. Introduction:

Brief outline of subject of medicine, a medical patient, common signs & symptoms of disease  
Metabolic & Endocrine Diseases: Brief description of following diseases along with outline of management: Diabetes Mellitus, hypo and hyperthyroid, hypo-parathyroid and Obesity

#### Module 2. Cardio-vascular System:

Manifestations of heart & vascular disease.  
Brief description of following diseases along with outline of management: Cardiac failure, Ischaemic heart disease, hypertension, atherosclerosis, Deep vein thrombosis, valvular heart disease, infective endocarditis

#### Module 3. Respiratory System:

Manifestations of respiratory disease.  
Brief description of following diseases along with outline of management: Obstructive Pulmonary diseases (Bronchial Asthma, COPD), pulmonary infections (Pneumonia, Bronchitis, Lung abscess, Tuberculosis), Respiratory failure, occupational lung disease, Pleurisy & Pulmonary embolism

#### Module 4. Alimentary tract:

Brief description of manifestations of alimentary tract disease & general principle of diagnosis & outline of management of following diseases: Peptic ulcer disease, common infections of small & large intestine  
Description of liver diseases along with outline of management: Hepatitis, & Jaundice

#### Module 5. Diseases of the blood:

Brief description of manifestations along with outline of management of common blood diseases - Anaemia, Leukaemia, Coagulopathy

#### Module 6. Geriatrics:

physiology of ageing, manifestations of diseases in old people and general principles of management  
Implications of aging in physical therapy

#### Module 7. Diseases of connective tissues:

Brief description of manifestations along with outline of management of - SLE, polymyositis  
Diseases of skin: Brief description of manifestations along with outline of management of common skin diseases - scabies, pediculosis, taeniasis, impetigo & psoriasis

## **Text & References:**

- Davidson's Principles & Practice of Medicine, Haslett Et al
- Harrison's Principles of Internal Medicine, Edited by Denna L. Kasper Et al
- Text Book of Medicine (vol. I & II), K.V. Krishna Das

## **Third Semester Exercise Therapy – I**

**Subject code: BPT 304**

### **Course Objectives:**

To understand the principles of exercise therapy and its application as a treatment modality

### **Module 1. Goniometry**

- Measurement of various joints range in normal and disease condition
- Different techniques of goniometry
- Limb length measurements

### **Module 2. Passive movements:**

- Definition
- Relaxed, forced and stretching type
- Indications, contraindications, advantages and Techniques of various passive movements

### **Module 3. Active movements:**

- Classification, principles, techniques, indications, contraindications, effects and uses of Free, assisted and resisted exercises.
- Indication, contraindications, advantages and techniques of various types of active exercises
- Special emphasis on: Shoulder abductors & flexors, Triceps brachii, Hip abductors & flexors, quadriceps femoris, Abdominal and back extensors
- Clinical methods of strengthening of various muscle groups

### **Module 4. Muscle Stretching:**

- Stretching – definition, effects and uses of stretching, indications, contra indications, general techniques & group stretching techniques
- Special emphasis on stretching of: Pectoral major, biceps brachii, triceps brachii, flexors of fingers, Rectus femoris, Ilio-tibial band, gastrocnemius-soleus, hamstrings, hip abductors, ilio-psoas, Sternocleidomstoid

### **Module 5. Relaxation:**

- Description of fatigue and spasm & factors
- General causes, signs and symptoms of fatigue
- Techniques of Relaxation- local and General with indication
- Rationale of relaxation Techniques
- Jacobson's, Mitchel's, additional methods

**Module 6. resisted exercises:**

- Types of resisted exercises: Manual and Mechanical resistance exercise, Isometric exercise, Dynamic exercise: Concentric and Eccentric, Dynamic exercise: Constant versus variable resistance, Isokinetic exercise, Open-Chain and Closed-Chain exercise.

**Module 7. Joint Mobility:**

- Joint range, stiffness, range and limitations
- Accessory movements- glides, traction and approximation
- Mobilization of peripheral, techniques and grading in detail

**Text & References:**

- The Principles of Exercise Therapy, Dena Gardiner
- Practical Exercise Therapy, Hollis, Margaret & Phylfletcher cook
- Therapeutics Exercise (Foundation & Technique), Colby & Kisner
- Tidy's Physiotherapy, Thomson Eal

**Third Semester  
Electrotherapy – I**

**Subject code: BPT 305**

**Course Objectives:**

To list indications and contraindications of various Modalities  
To understand different techniques of applications, their justification and effects  
Demonstration of individual techniques of applications of various modalities

**Module 1. Thermal Therapy Modalities:**

- Infrared Therapy:
- Therapeutic effects and uses, Techniques of application.
- Indications, contraindications precautions and Potential harmful effects.
- Heating Modalities:
- Therapeutic effects and uses, Techniques and applications
- Indications, contraindications, precautions and Potential harmful effects of various heat modalities:
- Paraffin wax bath therapy,
- Hydro collator packs,
- Whirlpool and moist heat Heating pads,
- Hot air chambers
- Fluidotherapy
- Cyclotherm
- Cryotherapy:
- Indications, contraindications and therapeutic effects.
- Technique, precautions and Potential harmful effects of treatment, Dosimetry contrast bath
- Contrast Bath

**Module 2. Ultrasonic Therapy:**

- Physiological and therapeutic effects & potential harmful effects
- Indications, contraindications, methods of application and precautions, Dosimetry

**Module 3. Actino-therapy:**

- Laser:
- Introduction, effects and potential harmful effects.
- Indication, contraindications, precautions, method of application, dosimetry
- Ultraviolet therapy:
- Physiological and therapeutic effects- photosensitization
- Indications and contraindications and Potential harmful effects.

- Methods of application, Sensitizes, Filters, Dosage, wavelength, penetration, tolerance, Treatment / Application condition wise
- Comparison between UVR & IR Therapy

#### **Module 4. Traction instruments:**

- Rationale, technique, indications, contraindications, precautions of electric traction equipment

#### **Text & References:**

- Evidence Based Practice (Clayton's electrotherapy), Foster & Palastanga
- Electrotherapy Explained, Low & Reed
- Clinical Electrotherapy, Nelson & Currier
- Electrotherapy Rehabilitation by Gersh Merry Roth

**Fourth Semester  
General Surgery**

**Subject Code: BPT 401**

**Course Outcomes:**

1. To make the students aware about basic knowledge of surgery.
2. To impart knowledge about Gynaecology And Obstetrics
3. To develop the insight about their role in post-surgical management.

**PART - A**

**Unit 1: General Introduction**

- 1.1 Introduction to surgery
- 1.2 Surgical patient
- 1.3 Principles of surgical examination (Brief Description)

**Unit 2: Anesthesia**

- 2.1 Pre anaesthetic check-up
- 2.2 Types of Anaesthesia used in various surgeries
- 2.3 Description of events frequently accompanying General Anesthesia.
- 2.4 Potential complications of anaesthesia & Management.

**UNIT 3: BASICS OF SURGERY**

- 3.1 Blood transfusion & Physiological response of the body.
- 3.2 Wounds, Scars, Ulcers, Boils, Carbuncles etc.
- 3.3 Principles of Pre and Post Operative Physical examination
- 3.4 Investigations

**PART-B**

**UNIT 4: BRIEF DESCRIPTION OF INCISIONS AND GENERAL SURGERIES**

- 4.1 Surgical Post operative complications and their examination
- 4.2 Incisions, Complications and management of following: Nephrectomy, Appendectomy, Herniorrhaphy, Mastectomy, Thyroidectomy, Colostomy, Adrenalectomy, Cystectomy, Hysterectomy, Prostatectomy, Cholecystectomy, Nesostomy, Incisional Hernia and its prevention

## **UNIT 5: BURN**

Introduction, causes, classification, medical management and precautions in the acute stage, Complications of burns and their management.

## **UNIT 6: Plastic Surgery:**

- 6.1 Principles of plastic surgery Post-operative management, and Complications.
- 6.2 Cineplasty, Principles of cosmetic surgery, Skin Grafting
- 6.3 Surgery of hand with emphasis on the management of traumatic and leprosy hand.
- 6.4 Plastics surgery management.

## **Recommended Books:**

1. Bailey & Love-Short Practice of Surgery
2. Under Graduate Surgery-Nan-Academic Publishers-Calcutta
3. Text Book of Surgery-Gupta R.I, Jaypee Bros.
4. Principle & Practice of Trauma Cases- Kocher-Jaypee Bros
5. Clinical Methods-S. Das-Calcutta

**Fourth Semester  
Obstetrics & Gynaecology**

**Subject Code: BPT 402**

**Course Outcomes:**

1. To make the students aware about basic knowledge of surgery.
2. To impart knowledge about Gynaecology And Obstetrics
3. To develop the insight about their role in post-surgical management.

**PART-A**

**UNIT 1: PHYSIOLOGY OF PREGNANCY**

- 4.1 Placenta and placental membranes.
- 4.2 Foetus.
- 4.3 Physiological changes during pregnancy.
- 4.4 Endocrinology in relation to reproduction.
- 4.5 Foetus – in - utero.
- 4.6 Foetal skull and maternal pelvis.

**UNIT 2: ANTENATAL AND POSTNATAL CARE**

- 4.7 Antenatal care.
- 4.8 Antenatal assessment of foetal well - being.
- 4.9 Normal labour, normal puerperium.
- 4.10 Complications of pregnancy and labour.

**Unit 3: GYNAECOLOGY AND OBSTETRICS**

- 4.11 History taking
- 4.12 Terminologies used.
- 4.13 Classification of Diseases.
- 4.14 Birth control.
- 4.15 Reproduction.

**PART-B**

**UNIT 4: SPECIAL CONSIDERATION OF OBSTETRICS**

- 6.1 Special considerations (previous history of C- section, Rh. –, elderly primigravida,
- 6.2 Grand multipara, bad obstetric history, obesity.
- 6.3 Term, newborn infant, low birth weight baby.
- 6.4 Diseases of the fetus and newborn.

**UNIT 5: SPECIAL CONSIDERATION OF OBSTETRICS**

- 6.5 Pharmacotherapeutics, induction of labour, operative obstetrics.
- 6.6 Special topics (foetal distress, intrapartumfoetal monitoring, shock in obstetrics,
- 6.7 Acute renal failure, blood coagulation disorders, high – risk pregnancy, immunology in obstetrics)
- 6.8 Aids to diagnosis in obstetrics.

## **UNIT 6: OBSTETRICS DISORDERS**

- 6.1 Pelvic inflammatory disease
- 6.2 Abortions and ectopic pregnancy.
- 6.3 Dysfunctional uterine bleeding defunction, causes, differential diagnosis, management.
- 6.4 Genital malignancies, cervix, uterus, vagina

### **Recommended Books:**

1. Gynaecology and Obstetrics in Health care of a woman by Seymoul L, Romney Mary Jane Gray. J.A Merrill.
2. Shaw's Text Book Gynaecology.
3. Jeffcoat's Principles of Gynaecology.

**Fourth Semester  
Exercise Therapy - II**

**Subject Code: BPT 403**

**PART A**

**Unit 1: Muscle Grading & Re- Education of Muscles**

- 5.1 Principles and applications techniques of manual muscle testing
- 5.2 Testing position, procedure and grading of muscles of the upper limb, lower limb and trunk etc.
- 5.3 Re-Education of Muscles: Techniques, Spatial Summation, Temporal Summation.
- 5.4 Re-Education Techniques and Facilitating Methods On Various Groups Of Muscles.
- 5.5 Progressive Exercises In Strengthening Using Various Application: (According To Their Muscle Power) Grade I- Grade IV.

**UNIT 2: Crutch Walking**

- 1.1 Components of a crutch
  - 1.1.1 Classifications of crutches, characters of a good crutch, preparing a patient for crutch walking, crutch walking muscles
  - 1.1.2 Measurement of crutches (axillary piece, hand piece). Crutch stance, crutch palsy.
  - 1.1.3 Type of of crutch walking (4 point, 3 point, 2 point) (non - weight bearing and partial weight bearing), modified 3 point (paraplegic and shuffling gait, swing to and swing through).
  - 1.1.4 Crutch measurement (sitting standing and lying positions) and various types of crutch walking (even ground stairs and ramps).

**UNIT 3: Posture And Gait**

- 3.1 Posture (static and dynamic). Definition of good posture, Muscles responsible for good posture.
  - 1.1.1 Postural mechanisms
  - 1.1.2 Assessment of posture (inspection, measurement - length of legs, width of pelvis, plumb line. ROM of trunk in flexion, extension, side flexion and rotation). Postural correction by: strengthening of muscles, mobilisation of trunk, Relaxation, Active correction of the deformities. Passive correction (traction) postural awareness, abdominal and back extensor.
  - 1.1.3 Outline principles in bracing of the trunk and surgical correction. Identification of abnormal posture, and postural corrective measures.
- 3.2 Gait and centre of gravity of the human body.
  - 1.2.1 Muscles responsible for normal gait, six determinants of gait (pelvic rotation, pelvic tilt, hip flexion, lateral displacement of pelvis knee flexion in stance phase, normal foot pattern during walking).
  - 1.2.2 Walking cycle: Stance (heel strike, foot flat, midstance, and push off), Swing (acceleration, mid swing and deceleration).

- 1.2.3 Following pathological gaits: Gluteus medius Gait, Gluteus maximus gait, Hip flexor weakness gait, Quadriceps weakness gait; Foot drop gait, hemiplegics gait, Ataxic waddling gait, equinus gait, calcaneus's gait, Equinovarus gait.
- 3.3 Skills in identifying pathological gait and proper gait training.
- 3.4 Pelvic Tilt - Normal pelvic tilts, alterations from normal, anterior tilt (forward) posterior tilt (backward), Lateral tilt. Muscles responsible for alterations and pelvic rotation. Identification of normal pelvic tilt, pelvic rotation and altered tilts and their corrective measures.

#### **UNIT 4: Co – Ordination and balance**

- 4.1 Balance (static and dynamic).
  - 4.1.1 Imbalance due to muscular disease. Re- education of balance.
- 4.2 Coordination
  - 4.2.1 Mechanism of neuromuscular co-ordination.
  - 4.2.2 In coordination : Lower motor neuron lesions, uppermotor neuron lesions (spasticity), Cerebellar lesions, Loss of kinesthetic sense (tabes dorsalis, syringomyelia, leprosy), Re-education co-ordination: Frenkel’s Exercises,
- 4.3 Proprioceptive neuromuscular facilitation (PNF) techniques.
  - 4.3.1 Basic procedure and principles used with PNF, specific techniques associated with PNF
  - 4.3.2 Techniques, patterns-diagonal, upper extremity pattern, lower extremity pattern.

#### **UNIT 5: Special Techniques**

- 1.1 Review of normal breathing mechanism, types, techniques, indications, contraindications, therapeutic effects & precautions of breathing exercises.
- 1.2 Functional re-education-general therapeutic techniques to re-educate ADL function.
- 1.3 Aerobic exercise: Fitness, maximum oxygen consumption, endurance, aerobic exercise training (conditioning), adaptation, myocardial oxygen consumption, deconditioning, energy systems, physiologic response to aerobic exercise, determinants of an exercise programs, exercise program, physiologic changes that occur with training, application of principles of an aerobic conditioning program for patients with coronary disease, applications of aerobic training for the deconditioned individual and the patients with chronic illness.

#### **UNIT 6: Basics Of Yoga**

Padahasthasana /Padangusthanasana, Trikonasana, Utkatasana, Padmasana, Siddhasana,/Sukhasana, Bhujangasana, Ardha- Salabhasana, Paschimottanasana, Savasana,Dhanurasana, ArdhaHalasana, Yogamudrasana, Uttanasana, Virasana, Vajrasana, SetuBandhasana, Gomukhasana, Pavan-Muktasana, Halasana, Sarvangasana, Naukasana,

## **Exercise Therapy - II (Practical)**

**Subject Code: BPT 403 P**

Various assessment and evaluation techniques for above mentioned should be demonstrated and practiced by the students

### **Recommended Books**

1. Principles of Exercise Therapy—Dena Gardiner-CBS Publishers
2. Massage, Manipulation & Traction---Sydney Litch
3. Massage- Hollis
4. Suspension Therapy in Rehabilitation—Margaret Hollis
5. Measurement of Physical Function - Cynthia Norkins
6. Therapeutic Exercise— foundation & techniques-Carolyn Kisner-FA Davis Co, Jaypee
8. Practical exercise therapy-Hollis-Blackwell Scientific Publications
9. Therapeutic exercise- Basmajian-Williams & Wilkins
10. Orthopaedic Physical Therapy-woods-Churchill Livingstone
11. Proprioceptive neuromuscular facilitation- Voss- Williams & Wilkins.

**Fourth Semester  
Electrotherapy – II**

**Subject Code: BPT 404**

**Course Outcomes:**

1. Should understand the basics of electrotherapy-II.
2. Should understand the application of modalities to patients.
3. Should understand their indications and contra-indications for patients.

**Unit 1: Introduction to Currents**

- 1.1 Introduction to AC, DC and Modified Currents.
- 1.2 Classification of Currents
- 1.3 Application of current in PT

**Unit 2: 1.Electrophysiology**

- 1.1 Nerve and Muscle tissue: production of interrupted and surged current & their effects.
- 1.2 Nerve Accommodation& its Prevention

**2. Electrical Reactions**

- 2.1 Electrical Stimuli and Electrical Properties of Nerve and muscle tissue.
- 2.2 Types of lesion and development of reaction of degeneration

**Unit 3: Low Frequency Currents**

- 3.1 Production of DC, physiological and therapeutic effects of constant currents
- 3.2 Iontophoresis
- 3.3 Modified Direct Current-various pulses, duration and frequency and their effect on Nerve and Transcutaneous Electric Nerve Stimulation (TENS)
- 3.4 Types of low frequency, pulse widths, frequencies & intensities used as TENS applications, Theories of pain relief by TENS, Principle of clinical application effects & uses indications, contraindications, precautions, and operational skills of equipment & patient preparation.

**PART B**

**Unit 4: Medium Frequency Currents: Interferential therapy (IFT)**

- 4.1 Principle
- 4.2 Indications and Contraindications
- 4.3 Physiological effects and techniques of applications.

**Unit 5: Electro-diagnostic tests**

- 5.1 Faradic - Intermittent direct current test.
- 5.2 S.D. Curve and its interpretation.
- 5.3 Chronaxie, Rheobase & pulse ratio
- 5.4 EMG, NCV tests

**Unit 6:** Deep heating modalities:

- 6.1. Short Wave Diathermy
- 6.2. Long wave Diathermy
- 6.3. Microwave Diathermy

**Unit 7: Advanced electrotherapy**

7.1 Biofeedback: Introduction, principles, therapeutic effects, indications, contra-indications and techniques of treatment

7.2 Computerization in electrotherapy, programming parameters, appropriate selection of parameters and combination therapy.

**Electrotherapy – II  
(Practical)**

**Subject Code: BPT 404 P**

Various assessment and evaluation techniques for above mentioned should be demonstrated and practiced by the students.

**Recommended Books:**

1. Physical Agents in Rehabilitation by Cameron.
2. Physical Principles Explained by Low and Reed.
3. Electrotherapy By Claytons

**Fourth Semester  
Kinesiology & Biomechanics -I**

**Subject Code: BPT 405**

**Course Outcomes:**

1. To describe movement precisely, using well-defined terms (kinematics)
2. To consider the role of force in movement (kinetics).
3. To develop knowledge about joint structure, muscle and their functions.

**PART - A**

**Unit 1: Mechanics**

- 1.1 Introduction to mechanics including motion, forces, parallel forces system vectors.
- 1.2 Newton's Law of motion, concurrent force system-composition forces, muscle action line etc.
- 1.3 Center of Gravity, line of gravity, stability and equilibrium, law of inertia.
- 1.4 Levers, torque, mechanical advantage.
- 1.5 Moment arm and anatomic pulleys.

**UNIT 2: Joint Structure**

- 1.1 Basic principles of joint design and a human joint.
- 1.2 Tissues present in human joint including dense fibrous tissue, bone, cartilage and connective tissue.
- 1.3 Classification of joints.

**UNIT: 3 Function of Joints**

- 3.1 Joint function, Kinematics chains and range of motion.
- 3.2 General effects of injury and diseases of upper extremity joints.

**PART B**

**UNIT 4: Muscle Structure and Function**

- 4.1 Mobility and stability functions of muscle
- 4.2 Elements of muscles structure and its properties.
- 4.3 Factors affecting muscle tension.
- 4.4 Types of muscle contraction and muscles work.
- 4.5 Classification of muscles and their functions.
- 4.6 Group action of muscles, co-ordinated movement.

## **UNIT 5: Regional Structure and Function**

- 5.1 Shoulder complex
- 5.2 Elbow complex
- 5.3 Wrist and Hand complex

### **Text Books:**

- 1. Joint Structure and Function- A comprehensive Analysis-Norkin&Levange-F.A davis
- 2. Biomechanics of Human Motion- Leveau
- 3. Measurement of joint motion-A guide to goniometry-Norkins& White-F.A davis

### **Reference Books:**

- 1. Brunnstrom's clinical kinesiology-Smith-F.A Davis
- 2. Basic biomechanics explained-Low & reed- Butterworth Heinmann
- 3. Kinesiology-Applied to pathological motion-SoderbergLippit

## **Kinesiology & Biomechanics -I (Practical)**

**Subject Code: BPT 405 P**

Various assessment and evaluation techniques for above mentioned should be demonstrated and practiced by the students

### **Recommended Books:**

- 1. Joint Structure and Function- A comprehensive Analysis-Norkin&Levange-F.A davis
- 2. Biomechanics of Human Motion- Leveau
- 3. Measurement of joint motion-A guide to goniometry-Norkins& White-F.A davis
- 4. Brunnstrom's clinical kinesiology-Smith-F.A Davis
- 5. Basic biomechanics explained-Low & reed- Butterworth Heinmann
- 6. Kinesiology-Applied to pathological motion-SoderbergLippit

**Fourth Semester  
Environmental Studies**

**Subject Code: 406**

**Course Objectives:**

1. Creating the awareness about environmental problems among people.
2. To -Impart basic knowledge about the environment and its allied problems.
3. To develop an attitude of concern for the environment.
4. To motivate public to participate in environment protection and environment improvement.
5. To acquire skills to help the concerned individuals in identifying and solving environmental problems.
6. Striving to attain harmony with Nature.

**PART A**

**Unit 1: Multidisciplinary nature of environmental studies**

- 1.1 Definition, Scope & Importance
- 1.2 Need for public awareness

**Unit 2: Natural Resources: Renewable & non-renewable resources- natural resources & associated problems**

- 2.1 Forest resources
- 2.2 Water resources
- 2.3 Mineral resources
- 2.4 Food resources
- 2.5 Energy resources
- 2.6 Land resources
- 2.7 Role of an individual in conservation of natural resources
- 2.8 Equitable use of resources for sustainable lifestyles.

**Unit 3: Ecosystems**

- 1.1 Concept of an ecosystem Structure & function of an ecosystem
- 1.2 Producers, consumers & decomposers
- 1.3 Energy flow in the ecosystem
- 1.4 Ecological succession
- 1.5 Food chains, food webs & ecological pyramids
- 1.6 Introduction, types, characteristic features, structure & function of the following ecosystem :-
  - Forest ecosystem
  - Grassland ecosystem
  - Desert ecosystem

- Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

## **PART B**

### **Unit 4: Biodiversity & its conservation**

- 1.1 Introduction – definition : genetic, species & ecosystem diversity
- 1.2 Bio geographical classification of India
- 1.3 Value of biodiversity : consumptive use, productive use social, ethical, aesthetic & option values
- 1.4 Biodiversity at global, National & local levels
- 1.5 India as a mega diversity nation
- 1.6 Hot spots of biodiversity
- 1.7 Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts
- 1.8 Endangered & endemic species of India
- 1.9 Conservation of biodiversity: In-situ & Ex-situ conservation of biodiversity.

### **Unit 5: Environmental Pollution**

5.1 Definition, Cause, effects & control measures of:-

- Air pollution
- Water pollution
- Soil pollution
- Marine pollution
- Noise pollution
- Thermal pollution
- Nuclear hazards

5.2 Solid waste management: causes, effects & control measures of urban & industrial wastes.

5.3 Role of an individual in prevention of pollution

5.4 Pollution case studies

5.5 Disaster management: floods, earthquake, cyclone & landslides.

5.6 Social issues & environment :-

- From unsustainable to sustainable development
- Urban problems related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement & rehabilitation of people; its problems & concerns. Case studies
- Environmental studies : issues & possible solutions
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents & holocaust. Waste land reclamation
- Consumerism & waste products
- Environmental protection Act
- Air (prevention & control of pollution) Act

- Water (prevention & control of pollution) Act
- Wildlife protection Act
- Forest conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

### **Unit 6: Human population & the environment**

- 6.1 Population growth, variation among nations
- 6.2 Population explosion – family welfare programme\
- 6.3 Environment & human health
- 6.4 Human rights
- 6.5 Value education
- 6.6 HIV/AIDS
- 6.7 Women & child welfare
- 6.8 Role of information technology in environment & human health
- 6.9 Case studies

### **Recommended Text Books:**

1. Text for Environmental Studies by *Erach Barucha* by UGC
2. Textbook of Environmental Studies by *Dr Sarita Sachdeva*, *MRIU Publishers*

**Fourth Semester  
Computer Applications  
(Practical)  
(Non-University)**

**Code BPT-407 P**

**Course Outcome:**

The students will be able to appreciate the role of computer technology. The course has focus on computer organization, computer operating system and software, and MS windows, Word processing, Excel data worksheet and PowerPoint presentation.

**PART A**

**UNIT 1** Introduction to computer: Introduction, characteristics of computer, block diagram of computer, generations of computer, computer languages.

**UNIT 2** Input output devices: Input devices(keyboard, point and draw devices, data scanning devices, digitizer, electronic card reader, voice recognition devices, vision-input devices), output devices(monitors, pointers, plotters, screen image projector, voice response systems).

**UNIT 3** Processor and memory: The Central Processing Unit (CPU), main memory.

**UNIT 4** Introduction of windows: History, features, desktop, taskbar, icons on the desktop, operation with folder, creating shortcuts, operation with windows (opening, closing, moving, resizing, minimizing and maximizing, etc.) and install different software.

**PART A**

**UNIT 5** 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.

**UNIT 6** Introduction to Excel: introduction, about worksheet, entering information, saving workbooks and formatting, printing the worksheet, creating graphs.

**UNIT 7** Introduction to power-point: introduction, creating and manipulating presentation, views, formatting and enhancing text, slide with graphs.

**UNIT 8** Internet and its Applications: definition, brief history, basic services (E-Mail, File Transfer Protocol, telnet, the World Wide Web (WWW)), www browsers, use of the internet.

Application of Computers in clinical settings.

Data entry efficiency

**Recommended Books:**

1. V. Rajaraman: Fundamentals of Computers, Prentice Hall of India, 2002
2. R. Hunt, J. Shelley: Computers and Commonsense, Prentice Hall of India, 2002
3. A. Leon, M. Leon, Fundamentals of Information Technology, Leon Vikas, 2002
4. MS Office 2007.

**EVALUATIVE CLINICAL PRACTICES –II  
(Practical)**

**Subject Code: 408 P**

**Course Outcomes:**

1. To augment the assessment.
2. To inculcate the foundations & functioning of Rehabilitation team.
3. To make the student comprehend the basic concept physiotherapy treatment

**Fifth Semester  
Clinical Orthopaedics- I**

**Subject code: BPT 501**

**Course Objectives:**

This subject follows the basic science subjects to provide the knowledge about orthopaedic conditions the therapist would encounter in their practice. The objective of this course is that after completion of the lectures and discussion the student will be able to demonstrate an understanding of orthopaedic conditions causing disability, list the etiology, clinical features and methods of investigations and management.

**Module I: Introduction to orthopaedics**

Introduction, Clinical examination, Common investigative procedures, Radiological and Imaging techniques, Inflammation and repair, Soft tissue healing.

**Module II : Traumatology**

Fracture: definition, types, signs and symptoms, Fracture healing, Complications of fractures, Conservative and surgical approaches, Principles of management  
Subluxation/dislocations – definition, signs and symptoms, management (conservative and operative).

**Module III: Fractures of Upper Limb**

Causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures:

Fractures of clavicle and scapula, Fractures of greater tuberosity and neck of humerus, Fracture shaft of humerus, Supracondylar fracture of humerus, radial head, olecranon, and epicondyles, Side swipe injury of elbow. Fracture of forearm – Monteggia, Galeazzi fracture, Colle's fracture, Smith's fracture, Scaphoid fracture, Fracture of the metacarpals, Bennett's fracture, Fracture of the phalanges,

Dislocations of Upper Limb –Mechanism of injury, clinical feature, complications, conservative management, surgical management of dislocation of shoulders and elbow.

**Module IV : Regional Conditions**

Mechanism of injury of each, clinical features, managements- conservative and surgical of the following soft tissue injuries:

1. Shoulder joint: Impingement Syndrome, rotator cuff injury, Bicipital tendinitis, Supraspinatus tendinitis, Adhesive Capsulitis, scapular dyskinesia, Subacromial bursitis
2. Elbow Joint: collateral ligament injury, tennis elbow, golfers elbow, olecranon bursitis
3. Wrist joint: wrist sprains, flexor tendon injuries, extensor tendon injuries, trigger finger, VIC, DeQuirvains disease, Dupuytren's contracture

**Module V : Amputations**

Definition, levels of amputation of lower and upper limbs, indications, complications.

**Module VI : Deformities**

Clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities.

Congenital Deformities of upper limb – Hand anomalies- syndactyly, polydactyly and ectrodactyly. Arthrogyposis multiplex congenital, Limb deficiencies- Amelia and Phocomelia. Klippel feil syndrome. Osteogenesis imperfect (fragile ossium),  
Acquired Deformities of upper limb

## **Module VII**

1. Disease of Bones and Joints: Causes, Clinical features, Complications, Management- medical and surgical of the following conditions:
  - a. Infective conditions: Osteomyelitis (Acute / chronic).TB of spine and major joints like shoulder, hip, knee, ankle, elbow etc.
  - b. Bone Tumors: classification, clinical features, management - medical and surgical of the following tumors: Osteoma. Osteosarcoma, Osteochondroma. Enchondroma, Ewing's sarcoma. Giant cell tumor. Multiple myeloma. Metastatic, tumors.
  - c. Metabolic Bone Diseases: Rickets. Osteomalacia, Osteopenia, Osteoporosis
2. Inflammatory and Degenerative Conditions: causes, clinical feature, complications, deformities, radiological features, management- conservative and surgical for the following conditions:
  - a. Osteoarthritis. Rheumatoid arthritis, Ankylosing spondylitis, Gouty arthritis, Psoriatic arthritis, Hemophilic arthritis, charcot's joints.
  - b. Connective Tissue Disorders- Systemic Lupus Erythematosus, Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease (MCTD)

## **Practicals:**

Independent Clinical Orthopaedic evaluation, presentation & recording of :

- a) 2 post-operative cases of fractures of upper limb
- b) 2 acute soft tissue injury of upper limb [including nerve injury]
- c) 2 case of Deformities of upper limb
- d) 1 cases of infections of bones and joints
- e) 1 case of Metabolic bone disease joints
- f) 1 case of amputation

Observation: Instruments used in orthopaedic surgery, Internal Fixator, External Fixator, orthopaedic Traction, Implants.

## **Reference Books:**

1. Apley's System of Orthopaedics and Fractures by Louis Solomon, David Warwick, and Selvadurai Nayagam (2010)
2. Text book of Orthopedics.— J. Maheswari.
3. Orthopedic Principles - A Resident's Guide by David Ip (2005)
4. Campbell's Operative Orthopaedics by S. Terry Canale and James H. Beaty (2007)
5. Outline of Orthopedics — John Crawford Adams.
6. Outline of Fracture — John Crawford Adams.



**Fifth Semester  
Physiotherapy in Orthopaedics I**

**Subject code: BPT 502**

**Course Objectives:**

- At the end of the course candidate will be able to identify, discuss & analyse, the Musculoskeletal Conditions in terms of Biomechanical & Kinesiology basis & understand the same with the provisional diagnosis, routine radiological & Electrophysiological investigations & arrive at appropriate functional diagnosis with clinical reasoning.
- Candidate be able to plan & Prescribe as well as acquire the skill of executing short & long term Physiotherapy treatment by selecting appropriate modes of Mobilization/ Manipulations, Electro-Therapy, Therapeutic exercise & appropriate Ergonomic advise for the relief of pain, restoration / Maintenance of function & rehabilitation for maximum functional independence in A.D.L. at home & work place.

**Module -1**

PT assessment and management of upper limb fractures and dislocations.

Fractures of clavicle and scapula, Fractures of greater tuberosity and neck of humerus, Fracture shaft of humerus, Supracondylar fracture of humerus, radial head. Fracture of forearm – monteggia, galeazzi fracture, Colle's fracture, Smith's fracture, Scaphoid fracture, Fracture of the metacarpals, Fracture of the phalanges,

**Module II**

PT assessment, aims, and management and home program of the following conditions

Shoulder joint: Impingement Syndrome, rotator cuff injury, Bicipital tendinitis, Supraspinatus tendinitis, Adhesive Capsulitis, scapular dyskinesia

Elbow Joint:collateral ligament injury, tennis elbow, golfers elbow, olecranon bursitis

Wrist joint: wrist sprains, flexor tendon injuries, extensor tendon injuries, trigger finger, VIC, Dequirvains disease, Dupuytren's contracture

**Module -III**

**Amputation:** Level of amputation of upper limb and lower limb, stump care, stump bandaging, Pre and postoperative physiotherapy management, pre and post prosthetic management including check out of prosthesis, training.

**Module -IV**

**Deficiency disease**

Physiotherapy Management of the following conditions

Rickets, Osteomalacia, Osteoporosis and other deficiency disorders

**Module -V**

PT assessment, aims, and management and home program of the following conditions

Rheumatoid arthritis, Ankylosing spondylitis, Gouty arthritis

**Practical**

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

**Reference Books:**

1. Cash textbook orthopedics and Rheumatology for physiotherapists – Downie
2. Orthopaedic Rehabilitation- Brotzman & Kelvin K Wilk
3. Tidy's physiotherapy- Tomson et. al
4. Essentials of orthopedics and applied physiotherapy - Joshi and Kotwal
5. Tetraplegia & Paraplegia- Ida Bromley- W.B. Saunders.
6. Orthopedics physiotherapy- Donatelli & Wooden
7. Rheumatological Physiotherapy- Carol David & Jill Loyd
8. Physiotherapy for amputee- Engstrom & Van de van
9. Sports Injury: Diagnosis and management: Norris Butterworth



**Fifth Semester**  
**Physiotherapy in General Medicine & General Surgical conditions-I**

**Subject code: BPT 503**

**Course Objectives:**

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

1. Acquire knowledge of rationales of basic investigative approaches in the medical system and surgical intervention, regimes in general surgeries (special emphasis on abdominal surgeries)
2. Select strategies for cure, care and prevention, adopt restorative and rehabilitative measures for maximum possible functional independence of a patient at home, work and in community.
3. Evaluate, grade and treat non healing wounds.

**Module I : Management of wound ulcers**

- Wound- Stages of wound Healing
- Ulcer Boils, carbuncles
- Scar assessment and management

**Module : II Abdominal Incision**

- Types of abdominal Incision: Vertical, Transverse and Thoraco-abdominal
- Complication of Bed rest/Immobilisation

### **Module : III Physiotherapy in pre and post-operative stages**

- Appendectomy,
- cholecystectomy,
- hernia Surgery
- Splenectomy,
- Nephrectomy
- Mastectomy

### **Module : IV Physiotherapy in Burn**

- Post-operative P.T. assessment and management of Burns and their complications.
- Skin grafting and flaps
- Physiotherapy in Plastics and Reconstructive Surgery

### **Module : V Geriatric Rehabilitation**

- Introduction to gerontology
- Physiological changes with ageing
- Physiotherapy evaluation and assessment of elderly patient
- Fall prevention and management

### **Practical**

- Assessment and practical demonstration of treatment of scar.
- Examination of Abdominal incision
- Assess the complication of bed rest and measures to prevent them.
- Pre and Post-operative surgical Rehabilitation techniques
- Assessment of burn and practical on management techniques post burn.
- Evaluation of Elderly
- Assessment of fall risk

### **Reference Books:**

1. Tidy's Physiotherapy
2. Cash Physiotherapy in General conditions
3. Physical Rehabilitation by Susan Sullivan
4. Management Principle for Physical Therapists



**Fifth Semester**  
**Research Methodology & Biostatistics-I**

**Subject code: BPT 504**

**Course Objectives:**

1. To develop skills of critical thinking and selection of research strategy
2. To acquire skills to review literature, formulate problems, research writing and publishing

**Module I : Introduction to Research methodology**

- Meaning of research
- Objective of research
- Types of research & research approaches
- Phases of Research
- Research Ethics.

**Module II : Research Problem and Research Question**

- Statement of research problem.
- Criteria for evaluating research problem
- Define Research Question
- Developing Answerable research Question
- Formulation of Hypothesis.
- Research Proposal

**Module III : Experimental Design**

- Group Design
- Single system design

**Biostatistics**

**Module IV : Introduction to Biostatistics**

- Definition of Statistics
- Characteristics of statistics
- Importance of the study of statistics
- Limitation of Statistics
- Descriptive and inferential statistics,

**Module V : Tabulation of Data:**

- Basic principles of graphical representation
- Data Representation- Frequency distribution tables
- Types of diagrams

- Normal probability curve.
- Skewness and kurtosis.

**Module VI : Measures of central tendency**

- Need for measures of central Tendency
- Definition and calculation of mean – ungrouped and grouped
- Meaning, interpretation and calculation of median ungrouped and grouped
- Meaning and calculation of mode

**Module VI : Sampling & Assignment**

- Methods of sampling
- Methods of Assignment

**Reference books:**

1. Research methods for Clinical Therapists by Carolyn M Hicks
2. Foundation of clinical Research by Portney & Watkins
3. Physical Therapy Research: Principles & Applications by Elizabeth Domholdt
4. Methods in Biostatistics: for medical students & research workers by B.K. Mahajan
5. Fundamentals of Statistics by S.C Gupta



**Fifth Semester  
Kinesiology & Biomechanics –II**

**Subject Code: 505**

**Course Objectives:**

1. To understand the mechanics of the human body
2. To understand various forces acting on body and the body response to them
3. Implementation of the concept of biomechanics to the various disorders

**PART - A**

**Module I :Regional Structure and Function**

- 1.1 The vertebral column
- 1.2 Hip complex
- 1.3 Knee complex
- 1.4 Ankle and Foot complex

## **Module II: Posture**

- Posture: Definition, factors responsible for posture, relationship of gravity on posture  
Postural in balance: factors responsible for in balance in static and dynamic positions including ergonomics.

## **Module III :Gait**

- 3.1 Description of normal gait, determinants of gait, spatio temporal features, and analysis.
- 3.2 Gait deviation: Types, causative factors and analysis.

## **PART B**

## **Module IV: Ergonomics**

- 4.1 Definition, Physiological and biomechanical risk factors
- 4.1 Visual display terminal and work station ergonomics

## **Module V**

- 5.1 Joints of the Thoracic Cage
- 5.2 Muscles Used in Respiration and Ventilation
- 5.3 Mechanics of Respiration

## **Module VI:**

- 6.1 Ergonomics in home activity
- 6.2 Leisure activity prevention, modification and rehabilitation of work related issues.

## **Practical**

Various assessment and evaluation techniques for above mentioned should be demonstrated and practiced by the students

## **Reference Books:**

1. Joint Structure and Function- A comprehensive Analysis-Norkin & Leverage-F.A davis.
2. Biomechanics of Human Motion- Leveau
3. Measurement of joint motion-A guide to goniometry-Norkins & White-F.A davis
4. Brunnstrom's clinical kinesiology-Smith-F.A Davis
5. Basic biomechanics explained-Low & reed- Butterworth Heinmann
6. Kinesiology-Applied to pathological motion-Soderberg Lippit

**Fifth Semester  
First Aid & Basic Nursing  
(Non-University)**

**Subject code: BPT 506**

**Course Objectives:**

1. To Know The importance of First aid in Physiotherapy and utilize the nursing process to provide individualized care to clients and significant support persons throughout the lifespan.
2. To Know the principles of client care management in the delegation of basic nursing procedures to qualified assistive personnel.

**Module I**

- Instrumentation used in First Aid (First Aid kit) & Examination of Vital Signs, First aid of Emergencies (Snake & animal bites, Poisoning, Electric shock, Hypovolemic Shock, Traumatic accidents, Cardiac arrest, Burns, spinal cord injuries & fractures)
- Indications, assessment and Technique of Cardio-pulmonary resuscitation
- Artificial ventilation & Basic life support

**Module II**

- Introduction and nursing principles of Nursing, Bandaging extremities: triangular bandages & their application Environment safety
- Bed Rest & Mobility - Bed making ( Prone, lateral dorsal, dorsal recumbent, fowler's position , Comfort measures, Aid to rest & sleeps, Transfers, Basic turns , Lifting patients up in the bed : transferring from bed to wheelchair, Transferring from bed to stretcher )

**Module III**

- Observation & Nourishment - Providing for patients elimination , Giving & taking bed pan, urinal: observation of stools, urine
- Observation of sputum - Understand use & case of catheters
- Methods of giving nourishment - Feeding tube, feeding drips, transfusions
- Care of rubber goods , Observation, reporting & recording temperature, respiration & pulse simple aseptic techniques, sterilisation & disinfection, Surgical dressing, Parental administer of medicine

**Reference Books:**

- Wellness and Physical Therapy, Fair, S.E. 1st Edition
- Primary Care for the PT: Exam & Triage Boissonnault, W. 2nd Edition , Guidelines for Exercise Testing & Prescription, ACSM, 9th Edition
- Resource Manual for Guidelines for Exercise Testing and Prescription, ACSM, 7th Edition
- Ewles, L. & Simnett, I. (2003) , Promoting Health. A practical guide. (5<sup>th</sup> ed). Ediburgh Ballière Tindall.
- First aid in emergency – St. John. Ambulance Association.
- Surgical & Medical Procedures for Nurses & Paramedical staff – Nathan.
- First aid & management of general injuries & common ailments-Gupta & Gupta.



**Sixth Semester  
Clinical Orthopaedics-II**

**Subject code: BPT 601**

**Course Objectives:**

This subject follows the basic science subjects to provide the knowledge about orthopaedic conditions the therapist would encounter in their practice. The objective of this course is that after completion of the lectures and discussion the student will be able to demonstrate an understanding of orthopaedic conditions causing disability, list the etiology, clinical features and methods of investigations and management.

**Module I : Fractures of Lower Limb**

Causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures: Fractures of Femoral Neck, trochanters, Fracture shaft femur, Supracondylar fracture of femur, Fractures of the condyles of femur, Fracture patella, Fractures of tibial condyles, Both bones fracture of tibia and fibula, Pott's fracture Bimalleolar fracture, Trimalleolar fracture, Fracture calcaneum, Fracture of talus, Fracture of metatarsals, stress fractures, Fracture of phalanges.

Dislocations of Lower Limb

Mechanism of injury, clinical features, complications and management of the following dislocations of hip, patella and Knee.

**Module II : Fracture of Spine**

Mechanism of injury, clinical feature, complications, Management of fracture of Cervical, thoracic & lumbar Spine, Fracture of Pelvis

**Module III : Regional conditions**

Mechanism of injury of each, clinical features, managements- conservative and surgical of the following injuries:

1. Hip Joint: IT band syndrome, Piriformis Syndrome, trochanteric Bursitis, Hamstring Strain
2. Knee Joint; Meniscal injuries, Cruciate injuries, Medial and lateral collateral injuries, chondromalacia patellae
3. Ankle Joint: Ankle sprain, planter fasciitis, calcaneal spur, achillis tendinitis, metatarsalgia
4. Spine: LBP, PIVD, Spondylosis, Spondylolisthesis, Lumbosacral strain, Lumbarization & sacralization, Coccydynia

**Module IV : Deformities**

Clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities.

Congenital Deformities of lower limb – CTEV, CDH, Flat foot,

Deformities of spine : Cervical rib, Torticollis, Scoliosis, Kyphosis, Lordosis

Acquired Deformities- Acquired, Genu varum, Genu valgum, Genu recurvatum, Coxa vara, Pes cavus, Hallux rigidus, Hallux valgus, Hammer toe, Metatarsalgia.

**Module VI : Neuromuscular Disorders**

Definition, causes, clinical feature, complications, management. (Multidisciplinary approach) medical and surgical of the following conditions:

Cerebral palsy, Poliomyelitis, Leprosy.

**Module VII : Orthopedic Surgeries**

Indications, Classification, Types, Principles of management of the following Surgeries: Arthrodesis, Arthroplasty, Osteotomy, External fixators, Spinal stabilization surgeries.

**Practicals:**

Independent Clinical Orthopaedic evaluation, presentation & recording of :

- a) 2 post operative cases of fractures of Lower limb
- b) 2 acute soft tissue injury of lower limb [including nerve injury],
- c) 2 cases of degenerative arthritis of extremity joints,
- d) 2 degenerative arthritis of spine,
- e) 2 chronic backaches
- f) 1 case of deformity of lower limb

**Reference Books:**

1. Apley's System of Orthopaedics and Fractures by Louis Solomon, David Warwick, and Selvadurai Nayagam (2010)
2. Text book of Orthopedics.— J. Maheswari.
3. Orthopedic Principles - A Resident's Guide by David Ip (2005)
4. Campbell's Operative Orthopaedics by S. Terry Canale and James H. Beaty (2007)
5. Outline of Orthopedics — John Crawford Adams.
6. Outline of Fracture — John Crawford Adams.



**Sixth Semester  
Physiotherapy in Orthopaedics II**

**Subject code: BPT 602**

**Course Objectives:**

- At the end of the course candidate will be able to identify, discuss & analyze, the Musculoskeletal Conditions in terms of Biomechanical & Kinesiology basis & understand the same with the provisional diagnosis, routine radiological & Electrophysiological investigations & arrive at appropriate functional diagnosis with clinical reasoning.
- Candidate be able to plan & Prescribe as well as acquire the skill of executing short & long term Physiotherapy treatment by selecting appropriate modes of Mobilization / Manipulations, Electro-Therapy, Therapeutic exercise & appropriate Ergonomic advise for the relief of pain, restoration / Maintenance of function & rehabilitation for maximum functional independence in A.D.L. at home & work place.

**Module I**

PT assessment and management of lower limb fractures and dislocations.

Fractures of Femoral Neck, trochanters, Fracture shaft femur, Supracondylar fracture of femur, Fractures of the condyles of femur, Fracture patella, Pott's fracture Bimalleolar fracture, Trimalleolar fracture, Fracture calcaneum, Fracture of talus, Fracture of metatarsals, Fracture of phalanges.

PT assessment and management of cervical spine, thoracic spine, lumber spine

**Module -II**

PT assessment, aims, and management and home program of the following conditions

Hip Joint: IT band syndrome, Piriformis Syndrome, Hamstring Strain

Knee Joint; Meniscal injuries, Cruciate injuries, Medial and lateral collateral injuries, chondromalacia patellae, Patellar Tendinitis

Ankle Joint: Ankle sprain, planter fasciitis, calcaneal spur, achillis tendinitis, metatarsalgia

Spine: Neck pain, LBP, PIVD, Spondylosis, Spondylolisthesis, Lumbosacral strain, Coccidynia

**Module -III**

**Physiotherapy Management of Deformities of Lower limb**

Congenital Deformities of lower limb – CTEV, CDH, Flat foot,

Acquired Deformities- Acquired, Genu varum, Genu valgum, Genu recurvatum, Coxa vara, Pes cavus, Hallux rigidus, Hallux valgus, Hammer toe, Metatarsalgia.

Deformities of spine : Cervical rib, Torticollis, Scoliosis, Kyphosis, Lordosis

**Module IV**

PT assessment, aims, and management and home program of the following conditions

Cerebral palsy, Poliomyelitis, Leprosy

**Module V**

PT assessment, aims, and management and home program of the following Orthopedic Surgeries: Arthrodesis, Arthroplasty, Osteotomy, Spinal stabilization surgeries.

**Practical**

Various physiotherapy modalities and treatment techniques for the above mentioned conditions to be demonstrated and practiced by the students in clinical setup. The examination pattern will be as following

One Long Case: based on the History 10 marks, Evaluation 10 marks, Treatment Plan on Patient 20 marks

Two Short Case: Simulated (25 marks)

Five spots: spots based on, X – ray (limb, spine), Orthosis, Prosthesis, Metal implants etc 3 minutes each spot and 3marks per spot (3x5)

### **Reference Books:**

1. Cash textbook orthopedics and Rheumatology for physiotherapists – Downie
2. Orthopaedic Rehabilitation- Brotzman & Kelvin K Wilk
3. Tidy's physiotherapy- Tomson et. al
4. Essentials of orthopedics and applied physiotherapy - Joshi and Kotwal
5. Tetraplegia & Paraplegia- Ida Bromley- W.B. Saunders.
6. Orthopedics physiotherapy- Donatelli & Wooden
7. Rheumatological Physiotherapy- Carol David & Jill Loyd
8. Physiotherapy for amputee- Engstrom & Van de van
9. Sports Injury: Diagnosis and management: Norris Butterworth



## **Sixth Semester Physiotherapy in General Medicine & General Surgical conditions -II**

**Subject code: BPT 603**

### **Course Objectives:**

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

1. Develop knowledge about the role and physiotherapy management in cancer.
2. Acquire the knowledge of evaluation and physiotherapeutic treatment for obstetric and gynecological conditions
3. Acquire the knowledge of various conditions where physiotherapy plays a vital role in the rehabilitation (dermatology and ENT conditions)

### **Module : I Physiotherapy in Oncology**

- Principles of Onco-rehabilitation
- Management of complication of Chemotherapy and Radiotherapy
- Physiotherapy Lymphedema management

### **Module II : Physiotherapy in Obstetrics and Gynaecology**

Principles of Physical Therapy Management with:

- Pelvic Floor Care
- Incontinence and prolapse uterus
- Pelvic inflammatory disease
- Musculo-skeletal and other problems associated with pregnancy, labour and caesarean section
- Physiotherapy in Ante-natal and post-natal care

### **Module III : Physiotherapy in Dermatology**

- Dermatological conditions: Psoriasis, Vitiligo, Acne vulgaris
- Leprosy ( including Neuro-muscular complications)

### **Module IV : Physiotherapy in ENT**

Sinusitis, non-suppurative and chronic suppurative otitis media, labyrinthitis, mastoidectomy, chronic rhinitis, laryngectomy, pharyngeal – laryngectomy, facial palsy.

### **Practical**

- Evaluation and management techniques for complication of cancer
- Management technique of lymphedema.
- Evaluation of urinary incontinence.
- Exercises in ante-natal and post-natal cases.
- Practical application of electrotherapy in management of skin condition
- Evaluation and management of complication after leprosy
  
- Physiotherapy management of ENT condition and complication like facial palsy

### **Reference Books:**

1. Tidy's Physiotherapy
2. Cash Physiotherapy in General conditions
3. Physical Rehabilitation by Susan Sullivan
4. Management Principle for Physical Therapists



**Sixth Semester**  
**Research Methodology & Biostatistics-II**

**Subject code: BPT 604**

**Course Objectives:**

1. To develop skills of critical thinking and selection of research strategy
2. To acquire skills to review literature, formulate problems, research writing and publishing

**Module I : Non-Experimental**

Introduction to non-experimental research  
Different types of non-experimental research

**Module II: Methods of data collection:**

- Primary and Secondary Data
- Variables

**Module III: Measurement & scaling techniques:**

- Measurement in research
- Scales of Measurements
- Reliability and validity
- Rate, ratio, proportion, incidence and prevalence.

**Module IV: Implementing Research**

- Research Proposal
- Critical Analysis of article
- Article Writing
- Referencing and Citation

**Biostatistics**

**Module V : Measures of Dispersion**

- Absolute Measures
- Relative measures

**Module VI : Testing of Hypothesis**

- Steps in Testing of Hypothesis
- Type I and type II errors.
- Level of significance, p value, Confidence Interval

**Module VII : Statistical Methods**

Basis Concept and Introduction

- Parametric test and non-parametric test,
- Correlation and regression

- Concept of t test, f test and chi square test
- Overview of available softwares used in analysis and research

**Reference books:**

1. Research methods for Clinical Therapists by Carolyn M Hicks
2. Foundation of clinical Research by Portney & Watkins
3. Physical Therapy Research: Principles & Applications by Elizabeth Domholdt
4. Methods in Biostatistics: for medical students & research workers by B.K. Mahajan
5. Fundamentals of Statistics by S.C Gupta



**Sixth Semester  
Professional Ethics & Administration**

**Subject Code: BPT 605**

**Course Objectives:**

The student will be able to learn about the basic ethical principles applied Physiotherapy practices and the code and rules of professional conduct. Besides ethical principles the students will get to know about the basic idea of administrative practices done in Physiotherapy or multi-speciality hospitals

**Module I :**

History of physiotherapy, Ethical principles in health care, Ethical principles related to physiotherapy, Scope of practice, enforcing standards in health profession-promoting quality care.

**Module II :**

Constitution & Functioning of the Indian association of Physical therapy and World confederation of Physical therapy (WCPT) and DCPTOT

**Module III :**

1. Professionalism in physiotherapy-Accountability, altruism, compassion/caring, excellence, integrity, professional duty, social responsibility.
2. Professional code of conduct (APTA)- attitude, therapist patients relationship, confidentiality, patients autonomy, professional responsibility, practices, endorsement of products/services, consumer protection, pro bono service etc.
3. Standards of professional Practice- ethical and legal consideration, administration of physical therapy service, patient/client management, education & research.

**Module IV :**

Malpractice and negligence, Legal aspects: Consumer protection act, Legal responsibility of physiotherapist for their action in professional context and understanding liability and obligations in case of medico-legal action

**Module V : Administration**

1. Introduction: Branches of administration, Nature and scope of administration, How to be an
2. Effective administrator, Planning hospital administration as part of a balanced health care program.
3. Principles of hospital administration and its applications to physiotherapy.
4. Planning and organization: Planning cycle, Principles of organizational charts, Resource and
5. quality management, Planning change -innovation
6. Financial issues including budget and income generation
7. Hospital administration: Organization, Staffing, Information, Communication, Coordination,
8. Cost of services, Monitoring and evaluation.
9. Organization of physiotherapy department: Planning, Space, Manpower, Other basic resources.

**Reference Books:**

1. Medical Ethics by C M Francis
2. Francis C M – Hospital Administration
3. Davies, R and Macaulay, BMC – Hospital Planning and Administration
4. Consumer Protection Act – 1986, Government of India, New Delhi.



**Sixth Semester**  
**Clinical Cardiothoracic Conditions**

**Subject code: BPT 606**

**Course Objectives:**

Following the basic science and clinical science course, this course introduces the Student in cardio-thoracic conditions which commonly cause disability.

The objective of this course is that after lectures and demonstration in addition to clinics the student will be able to demonstrate an understanding of Cardio-thoracic conditions causing disability and their management.

**Module I : Anatomy and Physiology**

Respiratory system : Upper respiratory tract, Lower respiratory tract – Trachea, Bronchial tree, Bronchopulmonary segments, Respiratory unit, hilum of lung, Muscles of respiration, Pleura, intra pleural space, intra pleural pressure, surfactant, Mechanics of respiration – Chest wall movements, lung & chest wall compliance, V/Q relationship, airway resistance, Respiratory centre, Neural & chemical regulation of respiration, Lung volumes and lung capacities, Spiro meter, lung function test, Pulmonary circulation, Lung sounds, cough reflex

Cardiovascular systems : Chambers of heart, semi lunar and atria ventricular valves, Coronary circulation, conductive system of heart, Cardiac cycle, ECG, Heart sounds, Blood pressure, pulse, cardiac output

**Module II : Cardio Vascular system**

Define, etiology, pathogenesis, clinical features, complications conservative and surgical management of the following conditions

- i. Ischemia heart disease
- ii. Myocardial infarction
- iii. Heart failure
- iv. Cardiac arrest
- v. Rheumatic fever
- vi. Hypertension
- vii. Infective endocarditis
- viii. Myocarditis & cardiomyopathy

**Module III : Cardiovascular Disease**

Clinical manifestations of Cardiovascular disease ; Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases and disorders of the heart : Pericarditis, Myocarditis, Endocarditis, Rheumatic Fever – resulting in valve disorders, Ischemic Heart Disease, Coronary Valve Disease, Congenital disorders of the Heart, Cardiac Arrest ;

Examination and Investigations of diseases of arteries and veins ; Hypertension : Definition, causes, classification, types, assessment, investigations and management.

Disorders of the Heart – Definition, Clinical features, diagnosis and choice of management for the following disorders : Congenital Heart diseases – Acyanotic congenital heart disease & Cyanotic congenital heart disease : Patent Ductus Arteriosus, Coarctation of Aorta, Atrial Septal Defect, Ventricular Septal Defect, Tetralogy of Fallot, Transposition of Great Vessels ;

Acquired Heart Disease – Mitral Stenosis & Insufficiency, Aortic Stenosis and Insufficiency, Ischemic Heart Disease – Coronary Artery Disease, Cardiac tumors.

#### **Module IV : Respiratory System**

Clinical manifestations of Lung disease ; Patterns of lung disease – Chronic Obstructive Lung Disease and Restrictive Lung Disease ;

Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following lung diseases : Chronic Bronchitis, Emphysema, Asthma, Bronchiectasis, Cystic Fibrosis,

Upper Respiratory Tract Infections, Pneumonia, Tuberculosis, Fungal Diseases, Interstitial Lung Diseases, Diseases of the pleura,

Respiratory failure – Definition, types, causes, clinical features, diagnosis and management.

Chest wall disorders- Definition, Clinical features, diagnosis and choice of management for the following disorders – chest wall deformities, chest wall tumors, Spontaneous Pneumothorax, Pleural Effusion, Empyema Thoracis, Lung abscess, Bronchiectasis, Tuberculosis, Bronchogenic Carcinoma, Bronchial Adenomas, Metastatic tumors of the Lung, tracheal Stenosis, Congenital tracheomalacia, Neoplasms of the trachea, Lesions of the Mediastinum. Carcinoma of the female breast.

#### **Practical:**

Examination of the Cardiovascular System Investigations : ECG, Exercise Stress Testing, Radiology ; Clinical manifestations of Cardiovascular diseases

Examination of the Respiratory System – Investigations : Chest Radiographs, Pulmonary Function Testing, Arterial Blood Gas Analysis, Clinical manifestations of Respiratory diseases

#### **Reference Books:**

1. Davidson's Principles & Practice of Medicine, Haslett Et al
2. Harrison's Principles of Internal Medicine, Edited by Denna L. Kasper Et al



**Sixth Semester  
Radiology & Radiodiagnosis  
(Non-University)**

**Subject code: BPT 607**

**Course Objectives:** This course covers the study of common diagnostic and therapeutic imaging tests. At the end of the course students will be aware of the indications and implications of commonly used diagnostic imaging tests as they pertain to patient's management. The course will cover that how X-Ray, CT, MRI, Ultrasound and Other Medical Images are created and how they help the health professionals to save lives.

**Module I : Introduction**

- a. History
- b. A New Kind of Ray
- c. How a Medical Image Helps
- d. What Imaging Studies Reveal

**Module II : Radiography**

- a. Equipment components
- b. Procedures for Radiography & Mammography
- c. Benefits versus Risks and Costs
- d. Indications and contraindications.
- e. Image Interpretation in X-ray Film of different common conditions

**Module III : Fluoroscopy**

- a. What is Fluoroscopy?
- b. Equipment used for fluoroscopy
- c. Indications and Contra indications
- d. How it helps in diagnosis
- e. The Findings in Fluoroscopy
- f. Benefits versus Risks and Costs.

**Module IV : Computed Tomography (CT)**

- a. What is Computed Tomography?
- b. Equipment used for Computed Tomography
- c. Indications and Contra indications
- d. How it helps in diagnosis
- e. Image Interpretation in Computed Tomography of different common conditions
- f. Benefits versus Risks and Costs.

**Module V : Magnetic resonance imaging (MRI)**

- a. What is MRI?
- b. Equipment used for MRI
- c. Indications and Contra indications
- d. How it helps in diagnosis
- e. The Findings in MRI of different common conditions
- f. Benefits versus Risks and Costs
- g. Functional MRI.

**Module VI : Ultrasound**

- a. What is Ultrasound?
- b. Equipment used for Ultrasound
- c. Indications and Contra indications
- d. How it helps in diagnosis
- e. The Findings in Ultrasound
- f. Benefits versus Risks and Costs.

**Module VII : Endoscopy**

- a. What is Endoscopy?
- b. Equipment used for Endoscopy
- c. Indications and Contra indications
- d. How it helps in diagnosis
- e. The Findings in Endoscopy
- f. Benefits versus Risks and Costs.

**Reference Books:**

1. Textbook of Radiology and Imaging 7th Edition
2. Clinical Radiology by Richard daffner
3. Diagnostic Radiology by Chaudhury, Gupta, khandelwal



**Seventh Semester**  
**Clinical Neurology and Neurosurgery -I**

**Subject code: BPT 701**

**Course Objectives:**

- To understand clinical manifestations of Neurological and Psychological disorders
- The rationale and implications of psychological disorders on disability
- To understand the management of neural & psychological disorders

**Module -I**

Nervous system: Disorders of Neurological functions in the light of Anatomy and Physiology (Brief description only) - Cerebrum, Cerebellum, Spinal Cord, Major Nerve Tracts, Motor System, Sensory System, Autonomic System, Reflexes, Communication & CSF.

Clinical examination of a neurological patient, General manifestations of nervous system disease & principles of diagnosis & management, Cranial Nerves and special senses with major emphasis on V, VII, X, XI, & XII

**Module -II**

Introduction, clinical features, assessment, diagnosis, medical & surgical Management of following conditions:

- Brief Description of Headache, migraine, raised intra-cranial pressure
- Disorders of cerebral circulation - ischaemia, haemorrhages (CVA), HT encephalopathy
- Demyelinating diseases (brief description) - acute disseminated encephalomyelitis, multiple sclerosis
- Convulsive disorders (brief description) - epilepsy (GM, PM, Psychomotor), tetany

**Module -III**

Metabolic and intoxication disorders (brief description) - Alcoholism, Drug addiction, heavy metals poisoning (lead, mercury, copper), Organo-phosphorous poisoning, electric shock, tetanus, botulism

**Module -IV**

Introduction, clinical features, assessment, diagnosis, medical & surgical Management of following conditions:

Peripheral nerve disorders: traumatic/ compression or entrapment neuropathy, polyneuritis, GB syndrome, diabetic polyneuropathy and spinal radiculopathies. Special emphasis on brachial and lumbosacral plexuses and major nerves – radial, ulnar, median, femoral, and sciatic nerve

**Module -V**

Extra pyramidal syndromes - Parkinson's disease, Chorea, Athetosis, Dystonia, Hemiballismus, Spasmodic Torticollis Developmental and degenerative syndromes – cerebral palsy, kernicterus, hereditary ataxias, motor neuron disease, Peroneal muscular

atrophy Inflammatory conditions (brief description) – meningitis (bacterial, tubercular), viral encephalitis, syphilis, rabies.

### **Practical**

The syllabus for practical examination shall be relevant portion of the theory

### **Reference Books:**

1. Principles of Neurology by Adams and Victor
2. Dejong's The Neurologic Examination by William W. Campbell
3. Neurology & Neurosurgery Illustrated by Lindsay
4. A short Textbook of Psychiatry by Niraj Ahuja



## **Seventh Semester Physiotherapy in Neurological Conditions-I**

**Subject code: BPT 702**

### **Course Objectives:**

- The subject serves to integrate the knowledge gained by the students in neurology and neurosurgery with skills to apply these in clinical situations of dysfunction and neurological pathology.
- The student will be able to identify disabilities due to neurological dysfunction, plan and set treatment goals
- The student will be able to apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore neurological function.

### **Module I: Basics of Neuroanatomy**

Cerebrum, Cerebellum, spinal cord, major nerve tracts, motor system, sensory system, autonomic system, reflexes, CSF

### **Module II: Clinical examination of a neurological patient**

Chief complaints, History taking – Present, Past, medical, familial, personal histories, Observation, Palpation, Higher mental function, Motor Examination – Muscle power, Muscle tone, Spasticity, Flaccidity, deep tendon reflexes, Superficial reflexes, Sensory examination – Superficial, Deep and Cortical sensations, Special tests – Romberg's, Kernig's sign, Brudzki sign, Tinels's sign, Slum test, Lehermitte's sign, Bells Phenomenon, Gower's sign, Sun set sign, Battle's sign, Glabellar tap sign, etc,

Balance examination, coordination examination, Assessment tools & Scales – Modified Ashworth scale, Berg balance scale, FIM, Barthel index, Glasgow coma scale, Mini mental state examination, Rancho Los Amigos Scale for Head injury, APGAR score, ASIA scale, Reflex Grading.

### **Module III: Evaluation and Management Brain Injury**

Cerebrovascular accidents -

Definition, etiology, classification – thrombotic, embolic, hemorrhagic Clinical findings, management

Head injury

Types and Mechanisms of head injury Clinical features, potential complications

Physiotherapy principles of immediate and postoperative therapeutic management

### **Module IV: Evaluation and Management of CNS Infections**

Etiology, Pathophysiology, Clinical features, assessment and management of

- Meningitis
- Tuberculous infection of CNS
- Tabes dorsalis
- Encephalitis

### **Module V: Evaluation and Management of Muscle Disorders and Movement Disorders**

- Parkinson disease
- Dystonia, Chorea, Ballism, Athetosis
- Ataxia- Cerebellar, Friedreich.
- Neurological Gaits - Hemiplegic gait, Parkinson gait, High step gait, Hyperkinetic gait, Hypokinetic gait, Waddling gait, Scissoring gait, Spastic gait, Choreaform Gait, Diplegic Gait, and Myopathic Gait.

### **Module VI: Basic Principle and concept of Neurological Treatment Approaches**

- Bobath Neurodevelopmental Therapy
- Proprioceptive Neuromuscular Facilitation.
- Motor Relearning Program
- Rood's approach

## **Practical**

### **Principles of Assessment**

- Skills in history taking: Present, Past, medical, familial, personal histories

- Assessment of higher mental function -Consciousness, Orientation, Wakefulness, memory

### **Cranial Nerve**

- Clinical assessment of neurological function of Cranial nerve

### **Sensory Function Examination**

- Sensory examination –Superficial, Deep and Cortical sensations

### **Motor System Examination**

- Reflexes –Developmental reflexes, deep tendon reflexes, Superficial reflexes
- Assessment of motor function: grading of muscle power, tone (Hypotonia, Hypertonia - spasticity and rigidity, Ataxia, Athetosis, Chorea) and assessment of range of motion.

### **Neurological Treatment Approaches**

- Bobath & Neurodevelopmental Therapy- Techniques
- Proprioceptive Neuromuscular Facilitation- Techniques
- Motor Relearning Program
- Rood's approach

### **Movement Disorder Examination**

- Assessment of Balance and coordination
- Assessment of gait - both normal and abnormal (spastic, ataxic and paralytic patterns)
- Functional Analysis, Assessment tools & Scales – Modified Ashworth scale, Berg balance scale, FIM, Barthel index, Glasgow coma scale, Mini mental state examination, Rancho Los Amigos Scale for Head injury, APGAR score, ASIA scale

### **Reference Books:**

1. Cash Text Book for Physiotherapists in Neurological Disorders-Jaypee Bros. Publication 5<sup>th</sup> edition
2. Proprioceptive Neuro Muscular Facilitation- By A.Susan
3. Right In The Middle-Patracia Devis,2<sup>nd</sup> edition
4. Stroke Rehabilitation--Margaret Johnson,3<sup>rd</sup> edition
5. Neurological Rehabilitation- Umphred Davis 6<sup>th</sup> edition
6. Neurological Physiotherapy-Problem solving approach: Susan Edwards, 2<sup>nd</sup> edition
7. Adult Hemiplegia: Evaluation and treatment: Berta Bobath, 2<sup>nd</sup> edition
8. Physical Rehabilitation by Susan O Sullivan



**Seventh Semester**  
**Physiotherapy in Cardiothoracic & Cardiopulmonary Conditions-I**  
**Subject code: BPT 703**

**Course Objectives:** The subject is designed to provide knowledge in assessing and planning physiotherapy interventions for various Cardiothoracic conditions.

The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs, student must know emergency drugs indication and contra-indication, care in intensive care unit (ICU) and to provide appropriate interventions to the patient.

**Module I : Investigations and tests**

Exercise tolerance Testing – Cardiac & Pulmonary, Radiographs, PFT, ABG, ECG, Hematological and Biochemical Tests. Bedside assessment of the patient-Adult & Pediatric

**Module II :**

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

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.

**Module III :**

Physiotherapy techniques to clear secretions – Hydration, Humidification & Nebulization, Mobilisation 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.

**Module IV :**

Drug therapy – Drugs to prevent and treat inflammation, Drugs to treat Bronchospasm, Drugs to treat Breathlessness, Drugs to help sputum clearance, Drugs to inhibit coughing, Drugs to improve ventilation, Drugs to reduce pulmonary hypertension, Drug delivery doses, Inhalers and Nebulisers.

**Module V :**

Neonatal and Pediatric Physiotherapy – Chest physiotherapy for children, the neonatal unit, Modifications of chest physiotherapy for specific neonatal disorders, Emergencies in the neonatal unit.

**Practical**

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

1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

**Reference Books:**

1. Cash`s Text book for Physiotherapists in Chest, Heart & Vascular diseases- Jaypee bros. Publication
2. Cash`s text book in General Medical & Surgical conditions for Physio therapists
3. Chest Physical therapy & Pulmonary rehabilitation-by Donna Frownfilter
4. Cardiopulmonary Physical therapy by Irwin Scott



## **Seventh Semester Physiotherapy in Sports- I**

**Subject code: BPT 704**

**Course Objectives:** This course will help the students to learn about sports injuries and to prevent them on and off the field. To provide about the basic idea of assessment and management also.

### **Module I**

Pre-exercise evaluation  
Sporting emergencies and on field assessment,  
Principles of management of soft and hard tissue injuries

### **Module II**

- Fitness testing
- Strength training for children & adolescents
- Environmental effects on training
- Exercise testing

### **Module III**

Physiological effects of exercise on body systems –

- Muscular system,
- Endocrine system,
- Cardio-respiratory system,
- Nervous system

### **Module IV**

- Principles of injury prevention
- Principles of training & Rehabilitation in sports injuries
- Risk factors in sports (intrinsic & extrinsic)

## **Module V**

- Nutrition in sports
- Diet planning
- Pre game meal
- Carbohydrate loading & bicarbonate loading

## **Practical**

Various Physiotherapy modalities and treatment techniques for above mentioned conditions should be demonstrated and practice by the students.

## **Reference Books:**

1. Principles of sports medicine by Brukner & Karim.
2. Athletic Injuries in sports by Magee.
3. Physical Therapies in Sports and Exercise by Kolt, G.S and Mackler.
4. Sports Injuries: Diagnosis and Management by Norris, C.M.
5. Orthopedic Physical Rehabilitation by Brotzman.
6. Sports Injuries: Diagnosis and Management by Garrick, J.G
7. Fundamentals of Sport Injuries and management Anderson, M.K.
8. Sport Injuries, Fu, and Stone.
9. Athletic Injuries and Rehabilitation James E.Z.
10. Running Injuries Guten, Gray N.
11. Soft Tissues: Trauma and sports Injury, Mclatchie, and Lennox.
12. Evaluation of Orthopedic and Athletic Starkey, and Ryan.



## **Seventh Semester Community based Rehabilitation & Bioengineering-I**

**Subject code: BPT 705**

## **Course Objectives:**

- The subject serves to integrate the knowledge gained by the students in community medicine and other areas with skills to apply these in clinical situations of health and disease and its prevention.
- The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify rehabilitation methods to prevent disabilities and dysfunctions due to various disease conditions and plan and set treatment goals and apply the skills gained in rehabilitating and restoring functions.

## **Module I :**

Rehabilitation: Definition, Types

Community: Definition of Community, Multiplicity of Communities, The Community based approach, Community Entry strategies, CBR and Community development, Community

initiated versus community oriented programme, Community participation and mobilization

### **Module II :**

Introduction to Community Based Rehabilitation: Definition, Historical review, Concept of CBR, Need for CBR, Difference between Institution based and Community based Rehabilitation, Objectives of CBR, Scope of CBR, Members of CBR team, Models of CBR

### **Module III :**

- Principles of Community based Rehabilitation. Role of P.T.-Principles of a team work of Medical person/P.T./O.T. audiologist/speech therapist /P.&O./vocational guide in C.B.R. of physically handicapped person and multipurpose health worker. Role of family members in the rehabilitation of a physically handicapped.
- Planning and management of CBR Programmes, CBR Programmed planning and management, Ownership and Governance, Decentralization and CBR, Management of CBR, Programmed sustainability, Communication and Coordination, Community participation, mobilization and awareness, CBR programme influence on promoting and developing public policies

### **Module IV :**

- Disability: Definition of Impairment, Handicap and Disability, Difference between impairment, handicap and disability, Causes of disability, Types of disability, Prevention of disability, Disability in developed countries, Disability in developing countries. Disability Surveys: Demography. Screening: Early detection of disabilities and developmental disorders, Prevention of disabilities- Types and levels
- Disability Evaluation: Introduction, What, Why and How to evaluate, Quantitative versus Qualitative data, Uses of evaluation findings

### **Module V :**

Role of Social work in CBR: Definition of social work, Methods of social work, History of social work, Role of social worker in rehabilitation

### **Module VI : Bioengineering**

- Principles of Orthotics
- Types, indications, contra indications assessment (check out), Uses and fitting- region wise, Upper extremity, lower extremity and spine
- Fabrication of simple splints and assistive & adaptive devices for upper and lower extremity – indications and applications

### **Practical:**

- Field visits to urban and rural PHC's., Visits to regional rehabilitation training center, Regular mobile camps, Disability surveys in villages, Disability screening,
- Demonstration of Evaluation and Physiotherapy prescription techniques for musculoskeletal, neuromuscular, cardio-respiratory, paediatric, gynecological and geriatric problems in community,

- Demonstration of evaluation and prescription techniques for ambulatory and assistive devices, Fabrication of low cost assistive devices with locally available materials.

**Reference Books:**

1. Rehabilitation Medicine by Howard A Rusk.
2. Rehabilitation Medicine by Joel A De lisa
3. Physical Rehabilitation – Assessment and Treatment – Sullivan & Schmitz F. A. Davis.
4. Occupational Therapy and Physical Dysfunction. Principles, Skills and Practices – Hand Splinting - Tuner, Forster & Johnson – Churchill Livingstone
5. Hand Splinting – Wilson – W. B. Saunders.
6. Orthotics in Rehabilitation : Mckee and Morgan – F. A. Davis



### **Course Objectives:**

- To understand clinical manifestations of Neurological and Psychological disorders
- The rationale and implications of psychological disorders on disability
- To understand the management of neural & psychological disorders

### **Module -I**

Introduction, clinical features, assessment, diagnosis, medical & surgical Management of following:

- Disorders of Spinal cord and Cauda Equina- spinal cord injury, paraplegia, quadriplegia, spina-bifida, transverse myelitis, Neurogenic bladder and bowel disease
- Muscle disorders – Progressive muscular dystrophy, polymyositis, myasthenia gravis, floppy infant syndrome
- Autonomic nervous system (brief description)– clinical features of autonomic disorders, autonomic dysreflexia, autonomic nervous system and pain

### **Module -II**

Introduction, Indications and Complications of following Neuro surgeries: Craniotomy, Cranioplasty, Stereotactic surgery, Deep brain stimulation, Burr-hole, Shunting, Laminectomy, Hemilaminectomy, Rhizotomy, Microvascular decompression surgery, Endarterectomy, Embolization, Pituitary surgery, Ablative surgery - Thalamotomy and Pallidotomy, Coiling of aneurysm, Clipping of aneurysm, and Neural implantation.

## **Psychiatry**

### **Module -III**

(Brief outline only)

Principles of psychiatric examination Modalities of psychiatric treatment Psychiatric illness and physical therapy link

Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illnesses -

i. Anxiety neurosis ii. Depression iii. Obsessive compulsive neurosis iv. Psychosis v. Maniac-depressive psychosis vi. Drug induced psychosis vii. Post-traumatic stress disorder viii.

Psychosomatic reactions: Stress and Health, theories of Stress – Illness

### **Module -IV**

Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illness

- i. Organic brain syndrome
- ii. Dementia
- iii. Drug dependence and alcoholism
- iv. Somatoform and Dissociate Disorders – conversion reactions, Somatization, Dissociate Amnesia, and Dissociate Fugue
- v. Multiple Personality & Depersonalization disorder

### **Module -V**

- i. Child psychiatry: Brief descriptions of manifestations, and management of childhood disorders - attention deficit syndrome, and behavioral disorders
- ii. Mental deficiency- (descriptive)
  - a. Mental retardation,
  - b. Learning disabilities
  - c. Autistic behavior

### **Practical**

The syllabus for practical examination shall be relevant portion of the theory

### **Reference Books:**

1. Principles of Neurology by Adams and Victor
2. Dejong's The Neurologic Examination by William W. Campbell
3. Neurology & Neurosurgery Illustrated by Lindsay
4. A short Textbook of Psychiatry by Niraj Ahuja



## **Eighth Semester Physiotherapy in Neurological Conditions-II**

**Subject code: BPT 802**

### **Course Objectives:**

- The subject serves to integrate the knowledge gained by the students in neurology and neurosurgery with skills to apply these in clinical situations of dysfunction and neurological pathology.
- The student will be able to identify disabilities due to neurological dysfunction, plan and set treatment goals
- The student will be able to apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore neurological function.

### **Module I: Evaluation and Management of Muscle Disorders**

- Myopathies
- Muscular dystrophy
- Spinal muscular atrophy
- Poliomyelitis, Post-Polio Syndrome.

### **Module II: Evaluation and Management of Peripheral Nerve Injuries and Disorders**

- Gullain Barr Syndrome
- Peripheral nerve injuries
- Entrapment neuropathies

- Peripheral neuropathies- Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, sciatic nerve palsy, Common peroneal nerve palsy,

### **Module III: Evaluation and Management Spinal Cord Disorders**

- Spinal cord injury: Types and Mechanisms of spinal cord injury, Clinical features, potential complications
- Physiotherapy principles of immediate and postoperative therapeutic management

### **Module IV: Diseases and disorders of the spinal cord**

Physiotherapy assessment & Management of the following

- Craniocerebral junction anomalies
- Syringomyelia
- Transverse Myelitis
- Subacute Combined Degeneration of the cord

### **Module V: Demyelinating & Degenerative Disorders of Nervous System**

- Acute disseminated encephalomyelitis
- Multiple sclerosis
- Motor Neuron Disease

### **Module VI: Paediatric Neurology**

Paediatric Examination, Developmental milestones, developmental reflexes, Neuro developmental screening tests. Evaluation & Management - History, Observation, Palpation, Milestone Examination, developmental reflex Examination, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential Diagnosis, Balance & Coordination examination, Gait analysis, Functional analysis, List of Problems & Complications, short & Long Term goals, Management of systemic complications, Management of Mechanical Complications,

Use of various neurological approaches & Modalities in Risk babies, Minimum brain damage, Developmental disorders, Cerebral palsy, Autism, Down's Syndrome, Hydrocephalus,, Spina bifida, and syringomyelia.

### **Practical**

Neurological Examination for above mentioned conditions should be demonstrated and practice by the students with the following:

- Evaluation and assessment of Muscular disorder cases.
- Evaluation and assessment Spinal Cord Disorders.
- Evaluation and assessment Management of Peripheral Nerve Injuries and Disorders.
- Evaluation and assessment Pediatric cases.

**Reference Books:**

1. Cash Text Book for Physiotherapists in Neurological Disorders-Jaypee Bros. Publication 5<sup>th</sup> edition
2. Proprioceptive Neuro Muscular Facilitation- By A. Susan
3. Right In The Middle-Patracia Devis,2<sup>nd</sup> edition
4. Stroke Rehabilitation--Margaret Johnson,3<sup>rd</sup> edition
5. Neurological Rehabilitation- Umphred Davis 6<sup>th</sup> edition
6. Neurological Physiotherapy-Problem solving approach: Susan Edwards, 2<sup>nd</sup> edition
7. Adult Hemiplegia: Evaluation and treatment: Berta Bobath, 2<sup>nd</sup> edition
8. Physical Rehabilitation by Susan O Sullivan



**Eighth Semester**  
**Physiotherapy in Cardiothoracic & Cardiopulmonary Conditions-II**

**Subject code: BPT 803**

**Course Objectives:** The subject is designed to provide knowledge in assessing and planning physiotherapy interventions for various Cardiothoracic conditions.

The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs, student must know emergency drugs indication and contra-indication, care in intensive care unit (ICU) and to provide appropriate interventions to the patient.

**Module I :**

Physiotherapy assessment and management of Obstructive lung conditions  
Physiotherapy assessment and management of Restrictive lung conditions.

**Module II**

Introduction to ICU : ICU monitoring –Apparatus, Airways and Tubes used in the ICU - Physiotherapy in the ICU – Common conditions in the ICU – Tetanus, Head Injury, Lung Disease, Pulmonary Oedema, Multiple Organ Failure, Neuromuscular Disease, Smoke Inhalation, Poisoning, Aspiration, Near Drowning, ARDS, Shock; Dealing with an Emergency Situation in the ICU.

**Module III**

- Management of breathlessness.
- Pulmonary Rehabilitation.
- Physiotherapy following Lung surgeries
- Respiratory failure – Oxygen Therapy and Mechanical Ventilation.

#### **Module IV**

- Physiotherapy management following cardiac surgeries.
- Cardiac Rehabilitation.
- Physiotherapy management following PVD.

#### **Module V**

- Abdominal Surgeries - Management of Pulmonary Restorative Dysfunction following surgical procedures on Abdomen and Thorax.
- Management of Amputations following Diabetes, PVD - Prosthesis in amputations of lower limbs following ulcers and gangrenes.
- Home program and education of family members in patient care.
- Treatment, Response to exercise and Implications of Physiotherapy in the following disease conditions: Hypertension, Diabetes, Renal Failure and Obesity.

#### **Practical:**

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

1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

#### **Reference Books:**

1. Cash`s Text book for Physiotherapists in Chest, Heart & Vascular diseases- Jaypee bros. Publication
2. Cash`s text book in General Medical & Surgical conditions for Physio therapists
3. Chest Physical therapy & Pulmonary rehabilitation-by Donna Frownfilter
4. Cardiopulmonary Physical therapy by Irwin Scott



### **Eighth Semester Physiotherapy in Sports- II**

**Subject code: BPT 804**

**Course Objectives:** This course will help the students about the basic idea of understanding an athlete's psychology, pharmacology in sports, dope and doping procedures etc. along with the traumatology in sports.

#### **Module I**

- Sports Psychology, Spirit & moral values,
- Doping in sports & performance enhancing drugs.
- Special aids in performance
- Protective equipment used in sports

#### **Module II**

## Measurement of fitness components and sports skills

- Measurement of muscular strength
- Measurement of muscular endurance
- Measurement of flexibility
- Determination exercise endurance

## **Module III**

### Sports injuries

- Spine – PIVD, Kissing spine, cervical whiplash injuries, facet joint syndrome, SI Joint dysfunction
- Hip – Muscle strain, Piriformis syndrome, ITB syndrome, osteitis pubis
- Knee – menisci, cruciate, collateral, osteochondritis, chondromalacia patellae, Biceps femoris tendonitis, swimmers knee, patello-femoral pain syndrome
- Leg & ankle – shin splint, achillis tendonitis & rupture, TA bursitis, ankle sprain, Plantar fasciitis, turf toe syndrome
- Head & face – Maxillo-facial injuries, helmet compression syndrome

## **Module IV**

### Sports injuries

- Shoulder – instability, rotator cuff injury, biceps tendonitis and rupture, pectoralis major rupture, scapular dyskinesis and acromio-clavicular joint injuries
- Elbow – tennis elbow, golfer's elbow
- Wrist and hand – carpal tunnel syndrome, gamekeeper's thumb

## **Module V**

### Sports in Special age groups:

- Female athletic triad
- Younger athlete- Musculo-skeletal problems, management, children with chronic Illness and nutrition
- Older athlete- Physiological changes with aging, benefits, risks of exercise in Elderly, exercise prescription guidelines for elderly

## **Practical**

Various Physiotherapy modalities and treatment techniques for above mentioned conditions should be demonstrated and practice by the students.

## **Reference Books:**

1. Principles of sports medicine by Brukner & Karim.
2. Athletic Injuries in sports by Magee.

3. Physical Therapies in Sports and Exercise by Kolt, G.S and Mackler.
4. Sports Injuries: Diagnosis and Management by Norris, C.M.
5. Orthopedic Physical Rehabilitation by Brotzman.
6. Sports Injuries: Diagnosis and Management by Garrick, J.G
7. Fundamentals of Sport Injuries and management Anderson, M.K.
8. Sport Injuries, Fu, and Stone.
9. Athletic Injuries and Rehabilitation James E.Z.
10. Running Injuries Guten, Gray N.
11. Soft Tissues: Trauma and sports Injury, Mclatchie, and Lennox.
12. Evaluation of Orthopedic and Athletic Starkey, and Ryan.



**Eighth Semester**  
**Community Based Rehabilitation & Bioengineering-II**  
**Subject code: BPT 805**

**Course Objectives:**

- The subject serves to integrate the knowledge gained by the students in community medicine and other areas with skills to apply these in clinical situations of health and disease and its prevention.
- The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify rehabilitation methods to prevent disabilities and dysfunctions due to various disease conditions and plan and set treatment goals and apply the skills gained in rehabilitating and restoring functions.

**Module I :**

- Role of Government in CBR: Laws, Policies, Programmes, Human Rights Policy, Present rehabilitation services, Legal aspects of rehabilitation
- Role of voluntary Organizations in CBR: Charitable Organizations, Voluntary health agencies
- National level and International NGO's, Multilateral and Bilateral agencies. International Health Organizations: WHO, UNICEF, World bank.

**Module II :**

- National District Level Rehabilitation Programme: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker
- Extension services and mobile units: Introduction, Need, Camp approach

**Module III :**

- Role of Physiotherapy in CBR: Prescribing exercise programme, Prescribing and devising low cost locally available assistive aids, Modifications physical and architectural barriers for disabled, Disability prevention, Strategies to improve ADL,

Rehabilitation programmes for various neuromusculoskeletal and cardiothoracic disabilities.

- Rehabilitation of paediatric disorders in the community: Early detection of high risk babies, Maternal nutrition and education, Rehabilitation of Cerebral Palsy, Polio, Downs Syndrome, Muscular Dystrophies etc., Prevention and rehabilitation of mental retardation and Behavioural disorders, Immunization programmes, Early intervention in high risk babies, Genetic counselling

#### **Module IV :**

Vocational training in rehabilitation: Introduction, Need, Vocational evaluation, Vocational rehabilitation services

#### **Module V :**

Industrial Health & Ergonomics - Occupational Hazards in the industrial area accidents due to

1. Physical agents-e.g.-Heat/cold, light, noise, Vibration, U.V. radiation, Ionizing, radiation,
2. Chemical agents-Inhalation, local action, ingestion,
3. Mechanical hazards-overuse/fatigue injuries due to ergonomic alteration & ergonomic evaluation of work place-mechanical stresses per hierarchy
4. Psychological hazards- e.g.-executives, monotonicity & dissatisfaction in job, anxiety of work completion with quality, Role of P.T. in Industrial setup & Stress management relaxation modes.

#### **Module VI : Bioengineering**

- Principles of Prosthetics
- Types, indications, contraindications, assessment check out, uses and fitting - region wise, upper extremity, lower extremity Prosthesis.

#### **Practical:**

- Field visits to urban and rural PHC's., Visits to regional rehabilitation training center, Regular mobile camps, Disability surveys in villages, Disability screening,
- Demonstration of Evaluation and Physiotherapy prescription techniques for musculoskeletal, neuromuscular, cardio-respiratory, paediatrics, gynecological and geriatric problems in community,
- Demonstration of evaluation and prescription techniques for ambulatory and assistive devices, Fabrication of low cost assistive devices with locally available materials.

#### **Reference Books:**

1. Rehabilitation Medicine by Howard A Rusk.
2. Rehabilitation Medicine by Joel A De lisa
3. Physical Rehabilitation – Assessment and Treatment – Sullivan & Schmitz F. A. Davis.
4. Occupational Therapy and Physical Dysfunction. Principles, Skills and Practices – Hand Splinting - Tuner, Forster & Johnson – Churchill Livingstone
5. Hand Splinting – Wilson – W. B. Saunders.
6. Orthotics in Rehabilitation : Mckee and Morgan – F. A. Davis

