

BHAGWANT UNIVERSITY
Sikar Road, Ajmer
Rajasthan



Syllabus

BPT Course

BHAGWANT UNIVERSITY
BACHELOR OF PHYSIOTHERAPY

YEAR I

Subject Code	Name of Subject	Teaching Period			Credits
		L	T	P	
01BTP101	Anatomy	3	1	0	4
01BTP102	Physiology	3	1	0	4
01BTP103	Psychology & Sociology	3	1	0	4
01BTP104	Fundamentals of Biomechanics & Exercise Therapy	3	1	0	4
01BTP105	Principles of Bioelectrical Modalities	3	1	0	4
01BTP106	Biochemistry	3	1	0	4
01BTP201	Practical Anatomy	0	0	2	1
01BTP202	Practical Physiology	0	0	2	1
01BTP203	Practical Fundamentals of Biomechanics & Exercise Therapy	0	0	2	1
01BTP301	Discipline & Extra Curricular activities	0	0	4	1
TOTAL		18	6	10	28

YEAR II

Subject Code	Name of Subject	Teaching Period			Credits
		I	T	P	
02BTP101	Pathology & Microbiology	ξ	1	0	4
02BTP102	Pharmacology	ξ	1	0	4
02BTP103	Medicine & Paediatrics	ξ	1	0	4
02BTP104	General Surgery	ξ	1	0	4
02BTP105	Exercise Therapy	ξ	1	0	4
02BTP106	Electro Therapy	ξ	1	0	4
02BTP201	Practical PT-Clinicals	ϕ	0	2	1
02BTP202	Practical Exercise Therapy	ϕ	0	2	1
02BTP203	Practical Electro Therapy	ϕ	0	2	1
02BTP301	Discipline & Extra Curricular activities		0	0	4
TOTAL		18	6	10	28

YEAR III

Subject Code	Name of Subject	Teaching Period			Credits
		L	T	P	
03BTP101	Neurology including Psychiatry	3	1	0	4
03BTP102	Orthopaedics	3	1	0	4
03BTP103	Obstetrics & Gynaecology	3	1	0	4
03BTP104	Applied Biomechanics & Kinesiology	3	1	0	4
03BTP105	Physiotherapeutic in Neurology	3	1	0	4
03BTP106	Physiotherapeutic in Orthopaedic	3	1	0	4
03BTP201	Practical PT-Clinicals	0	0	2	1
03BTP202	Practical Physiotherapeutic in Neurology	0	0	2	1
03BTP203	Practical Physiotherapeutic in Orthopaedic	0	0	2	1
03BTP301	Discipline & Extra Curricular activities	0	0	4	1
TOTAL		18	6	10	28

YEAR IV

Subject Code	Name of Subject	Teaching Period			Credits
		L	T	P	
04BTP101	Community Rehabilitation & Disability Prevention	3	1	0	4
04BTP102	Research Methodology & Biostatistics	3	1	0	4
04BTP103	Physiotherapeutic in General & Cardio thoracic	3	1	0	4
04BTP104	Physiotherapeutic in Sports	3	1	0	4
04BTP201	Practical PT-Clinicals	0	0	2	1
04BTP202	Practical Physiotherapeutic in General & Cardio thoracic	0	0	2	1
04BTP203	Practical Physiotherapeutic in Sports	0	0	2	1
04BTP204	Project Work		0	16	8
04BTP301	Discipline & Extra Curricular activities	0	0	4	1
TOTAL		12	4	26	28

NOTE: - INTERNSHIP OF SIX MONTH

YEAR I

ANATOMY

Course/Paper: 01BTP101

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.

Learning Outcomes:

- Develop a vocabulary of appropriate terminology to effectively communicate information related to anatomy
- Recognize the anatomical structures
- Use anatomical knowledge to predict physiological consequences, and use knowledge of function to predict the features of anatomical structures.

BPT YEAR I

Course Contents: All sections carry equal weightage

Section – A

- General Anatomy:
 - Introduction to Anatomy, terms and terminology
 - Regions of Body, cavities and Systems outline.
 - Surface anatomy – musculo-skeletal and cardiopulmonary
 - Cell Structure and function of cell organelles (Brief outline only).
 - Connective tissue & its modification, tendons, membranes, Special connective tissue.
 - 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
 - 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.
- Upper extremity:
 - Bony architecture
 - Joints – structure, range of movement
 - Muscles – origin, insertion, actions, nerve supply
 - Major nerves – course, branches and implications of nerve injuries
 - Development of limb bones, muscles and anomalies
 - Radiographic identification of bone and joints

Section – B

- Lower Extremity:
 - Bony architecture
 - Joints – structure, range of movement
 - Muscles – origin, insertion, actions, nerve supply
 - Major nerves – course, branches and implications of nerve injuries
 - Development of limb bones, muscles and anomalies
 - Radiographic identification of bone and joints

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

Section – C

- Thorax:
Thoracic cage
Pleural cavities & pleura
Lungs and respiratory tree
Heart and great vessels
Diaphragm
- Head and neck:
Cranium
Facial Muscles
Central nervous system – disposition, parts and functions
Cerebrum
Cerebellum
Midbrain & brain stem
Blood supply & anatomy of strokes
Spinal cord- anatomy, blood supply, nerve pathways
Pyramidal, extra pyramidal system
Thalamus, hypothalamus
Ventricles of brain, CSF circulation
Development of nervous system & defects (Brief Description)
Cranial nerves – special emphasis on V, VII, X, XI, XII (course, distribution and palsies)

Sympathetic nervous system, its parts and components (Brief Description)
Parasympathetic nervous system (Brief Description).
- Miscellaneous:
• Embryology in brief covering neuromuscular developmental aspects
• Endocrine - system – Pituitary, Thyroid, parathyroid (Brief Description)
• Special senses (Brief Description): Nerve receptors, Eye, Ear, Labyrinth
• 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

Suggested Readings:

S.No.	Author	Title	Publisher	Year	Vol.
1	Chaurasia, B D	Human Anatomy: Regional and Applied	CBS, New Delhi	2004	3V
2	Chaurasia, B D	Human Osteology	CBS, New Delhi	1991	
3	Singh, Inderbir	Text Book of Anatomy: With Color Atlas	Jaypee, New Delhi	1999	3V
4	Singh, Inderbir	Text Book of Neuroanatomy	Jaypee, New Delhi	1999	
5	Singh, Inderbir	Text Book of Human Histology	Jaypee, New Delhi	1997	
6	Singh, Inderbir	Text Book of Human Osteology	Jaypee, New Delhi	1997	
7	Garg, Krishna	Text Book Histology	CBS, New Delhi	1997	
8	Singh, Inderbir	Multiple Choice Questions in Anatomy	Jaypee, New Delhi	1989	
9	Datta, A.K.	Essentials of Human Anatomy: Neuroanatomy	Current Book, Calcutta	1997	
10	Datta, A.K.	Essentials of Human Anatomy: Thorax and Abdomen	Current Book, Calcutta	1997	
11	Williams, Peter L	Gray's Anatomy: Anatomical Basis of	Churchill Livingstone, New York	1995	
12	McMinn, M. H.	Colour Atlas of Human Anatomy	Mosby-Wolfe, London	1995	
13	Snell, Richard S	Clinical Anatomy for Medical Students	Little- Brown, Boston	1995	
14	Field, Derek	Anatomy: Palpation and Surface Markings	Butterworth, London	1997	

PHYSIOLOGY

Course/Paper: 01BTP102

BPT YEAR -I

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.

Learning Outcomes:

- Describe the structure of major human organs and explain their role in the maintenance of healthy individuals.
- Explain the interplay between different organ systems and how organs and cells interact to maintain biological equilibria in the face of a variable and changing environment.
- Explain physiological processes accurately and concisely in journal-style format and orally, using relevant scientific terminology and nomenclature.

Course Contents: All sections carry equal weightage

Section – A

- a. General Physiology
 - Structure of cell membrane
 - Transport across cell membrane
 - Functional morphology of the cell
 - Intercellular communication
 - Homeostasis
- b. Cardiovascular System
 - Dynamics of blood & lymph flow
 - Anatomical, biophysical consideration of arterial, arteriolar & capillary venous level, Lymphatic circulation
 - Origin and spread of cardiac excitation
 - Basic idea of Electrocardiogram
 - Mechanical events of Cardiac cycle, Cardiac output, its regulation
 - Local & systemic regulatory mechanisms of CVS, humeral & neural
 - Cerebral, coronary, splanchnic, skin, Placental & Fetal circulation
- c. Respiratory System
 - Physiological anatomy of lungs, mechanics of respiration
 - Pulmonary circulation, Gas exchange in lungs
 - Oxygen & Carbon dioxide transport
 - Other function of respiratory system
 - Neural & chemical control of breathing
 - Regulation of respiratory activity, non-chemical influences on respiratory activity
- d. Cardio respiratory adjustments in health & disease
 - Exercise, high altitude, deep sea diving
 - Hypoxia, hypercapnia, hypocapnia, oxygen treatment
 - Asthma, emphysema, artificial respiration

Section – B

- Blood
 1. W.B.C., R.B.C., Platelets formation & functions
 2. Plasma, Blood Groups
 3. Haemostasis, Immunity
- Renal System
 1. Glomerular filtration rate, clearance, Tubular function
 2. Water excretion, concentration of urine-regulation of Na, Cl, K excretion
 3. Physiology of urinary bladder
 4. Nerve - Muscle and Synaptic & Junction Transmission
- Nerve – General Concept

Nerve cell – structure
 Genesis of resting membrane potential & Action potential
 Their ionic basis, All or None phenomenon
 Ionic basis of nerve conduction
 Classification & types of nerve fibre
 Mixed nerves & compound action potential
 Concept of nerve injury & Wallerian degeneration
 Muscle properties and functions
 Electric & Mechanical responses & their basis
 Concept of isometric & isotonic muscle contraction
 Electrical events in postsynaptic neurons
 Inhibition & facilitation at synapses
 Chemical transmission of synaptic activity
 Principal neurotransmitter system
 Neuromuscular junction, structure & events occurring during excitation

Section – C

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

- Functions of Nervous system (descriptive)
 - Reflexes, monosynaptic, polysynaptic, withdrawal reflex
 - Properties of reflexes
 - Sense organ, receptors, electrical & chemical events in receptors
 - Ionic basis of excitation
 - 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 behaviour, fear & range, motivation

- Miscellaneous
 - Special senses
 - Endocrinology
 - Male & female reproductive system

Suggested Readings:

S.No.	Author	Title	Publisher	Year	Vol.
1	Chatterji, C. C.	Human Physiology	Medical Allied	1997	2V
2	Keele, Cyril A	Samson Wright's Applied Physiology	Oxford University Press	1998	
3	Bijlani, R L	Understanding Medical Physiology	Oxford University Press	1998	
4	Guyton, A.C. and Hall, J. E.	Textbook of Medical Physiology	W.B.Saunders, Singapore	1998	

PSYCHOLOGY & SOCIOLOGY

Course/Paper: 01BTP103

BPT YEAR-I

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.

Note: This course is to be taught by two teachers (Psychologist & Sociologist / Medical Sociologist). Each part carries equal weightage. External Question Paper for each part shall be set by two relevant subject paper setters. The examinees shall use different answer books for the two different parts. And, relevant subject teachers shall evaluate these.

Learning Outcomes:

- Use critical thinking skills in a variety of domains;
- Think scientifically about behavior, mental processes, and underlying mechanisms;
- Apply broad perspectives to behavior from both an individual and cultural point of view.
- Appreciate how psychological findings can be used to make informed judgments that strengthen the community and build public policy.

Course Contents: All sections carry equal weightage

PSYCHOLOGY (PART – A)

Section – A

- What is psychology? Fields of application of psychology, influence of heredity and environment on the individual
- Learning – theories & principles learning
- Memory, Forgetting, theories of memory and forgetting, thinking & methods to improve memory
- Thinking – process, problem solving, decision making and creative thinking
- Motivation - theories and types of Motivation
- Emotions - theories of Emotions and stress
- Attitudes – theories, attitudes and behaviour, factors in attitude change
- Intelligence - theories of intelligence
- 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
- Counseling - Definition, Aims and principles
- Psychotherapy – brief introduction to paradigms in psychopathology and therapy

Section – B

- Psychological need of children and geriatric patients
- Communication – effective and faulty
- Emotional and behavioral disorders of childhood and adolescence- (in brief)
 - Disorders of under and over controlled behavior
 - Eating disorders
- Mental deficiency-
 - Mental retardation,
 - Learning disabilities
 - Autistic behavior
- Anxiety Disorders -
 - Phobias, panic disorder,
 - Generalized Anxiety disorder,

- Obsessive Compulsive Disorder,
Post –traumatic Stress Disorder
- Somatoform and Dissociate Disorders -
Conversion Disorder,
Somatization Disorder,
Dissociate Amnesia & Dissociate Fugue
- Personality Disorder
- Patho-physiological Disorders – stress and health
- Severe psychological disorders – Mood disorders, psychosis

SOCIOLOGY (PART – B)

Section – C

A-Introduction

- Meaning-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.

The meaning of Social Factors. 2. The role of Social factors and illness. C-Socialization: Meaning and nature of Socialization.

Primary, Secondary, and Anticipatory Socialization.

Agencies of Socialization. D. Social Groups:

Concepts of social groups.

Influence of formal and informal groups on health and sickness.

The roll of primary groups and secondary groups in the hospital and rehabilitation settings.

- c. The family - Meaning and definition, Functions
 - d. Changing family Patterns
 - e. Influence of family on the individual health, family, and nutrition.
4. The effects of sickness on family and psychosomatic disease and their importance to Physiotherapy

F-Community:

- a) Rural community – Meaning and features – Health hazards of rural population
- b) Urban community – Meaning and features – Health hazards of urban population

Section – D

G-Culture and Health:

- 1. Concept of culture
 - 2. Cultures and Behaviour
 - 3. Cultural meaning of sickness
 - 4. Culture and health disorders
- H-Social change:
Meaning of social changes & Factors of social change.
Human adaptation and social change.
Social change and stress.
Social and deviance.
Social change and health Program.

The role of social planning in the improvement of health and in rehabilitation. I-Social problems of disabled:

Consequences of the following social problems in relation to sickness and Disability, remedies to prevent these problems

- 1. Population explosion.
- 2. Poverty and unemployment.
- 3. Beggary.
- 4. Juvenile delinquency.
- 5. Prostitution.
- 6. Alcoholism.
- 7. Problems of women in employment.

J-Social security: Social security and social legislation in relation to the Disabled.

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

Suggested Readings:

S.No.	Author	Title	Publisher	Year	Vol.
1	Morgon, Clifford T	Introduction to Psychology	Tata Mcg. Hill, Delhi	1999	
2	Farnald, L.D.	Introduction to Psychology	AITBS, Delhi	1999	
3	Korchin, Sheldon J.	Modern Clinical Psychology: Principals	CBS, New Delhi	1999	
4	McDavid, J.W. and Harari, H.	Social psychology: Individuals, Groups, Societies	CBS, New Delhi	1999	
5	Davison, G.C. and Neale, J.M.	Abnormal Psychology	Jhon Wiley, New York	1997	
6	Mehta, Manju	Behavioral Sciences in Medical Practice	Jaypee, New Delhi	1998	
7	Bhusan, Vidya and Sachdeva, D.R.	Introduction to Sociology	Kitab Mahal, New Delhi	1999	
8	Turner, J. H.	Structure of Sociological Theory	Jaipur Publication	1995	
9	Anand Kumar	Indian Society and Culture	Vivek, New Delhi	2000	

FUNDAMENTALS OF BIOMECHANICS & EXERCISE THERAPY

Course/Paper: 01BTP104

BPT YEAR-I

Course Objectives:

This course will enable the student to understand the basic principles of biomechanics & exercise therapy, basic principles and application of soft tissue manipulation

Learning outcomes:

- Integrate knowledge of basic sciences and physical therapy in order to modify treatment approaches that reflect the breadth and scope of physical therapy practice.
- Integrate the use of basic principles of research in critical analysis of concepts and findings generated by self and others.
- Actively recognize the rights and dignity of individuals in planning and administering programs of care.

Course Contents: All sections carry equal weightage

Section – A

All topics are for a brief description only

1. Mechanics - Definition of mechanics and Biomechanics
2. Force - Definition, diagrammatic representation, classification of forces, concurrent, coplanar and co-linear forces, composition and resolution of forces, angle of pulls of muscle

3. Momentum - principles, and practical application
4. Friction
5. Gravity - Definition, line of gravity, Centre of gravity
6. Equilibrium - Supporting base, types, and equilibrium in static and dynamic state
7. Levers - Definition, function, classification and application of levers in physiotherapy & order of levers with example of lever in human body
8. Pulleys - system of pulleys, types and application
9. Elasticity - Definition, stress, strain, HOOKE'S Law
10. Springs - properties of springs, springs in series and parallel, elastic materials in use

Section – B

1. Aims and scope of various biomechanical modalities – shoulder wheel, shoulder ladder, shoulder pulleys, pronator-supinator instrument, static cycle, rowing machine, ankle exerciser, balancing board, springs, weights
2. Normal Posture - definition & description, static and dynamic, alignments of various joints, centre of gravity, planes & muscular moments, and Analysis of posture
3. Movements - Anatomical definition and description, Movements and exercise as therapeutic modality and their effects, Physiological reaction of exercise
4. Traction - Rationale, Technique, indications & contra-indications

Section – C

1. Normal Gait - definition & description, alignments, centre of gravity during gait cycle, planes & muscle acting mechanisms, pattern, characteristics Normal gait cycle, time & distance parameters, & determinants of Gait
2. Starting positions - Description and muscle work, Importance of fundamental and derived types, Effects and uses of individual positions
3. Soft tissue manipulation - History, definition, types and their rationale, general effects, local effects of individual manipulation (physiological effects) and uses, contra-indications and techniques of application

Suggested Readings:

S.No.	Author	Title	Publisher	Year	Vol.
1	Hollis, M. and Cook, P.F.	Practical Exercise Therapy	CBS, New Delhi	1999	
2	Gardiner, Dena	Principles of Exercise Therapy	CBS, New Delhi	1999	
3	Lippert, Lynn	Clinical Kinesiology for Physical Therapy	Jaypee New Delhi	1996	
4	Pagliarulo, M.A.	Introduction to Physical Therapy	Mosby, London	2001	
5	Jones,	Human Movement Explained	Butterworth Heine	2000	

PRINCIPLES OF BIO-ELECTRICAL MODALITIES

Course/Paper: 01BTP105

BPT YEAR-I

Course Objectives:

This course will enable the student to understand the basic electricity, electronics, equipments and their application in Electrotherapy.

Learning Outcomes:

- Describe the basic of Physics which is used in Electrotherapy Modalities,
- Explain the electrical supply of Electrotherapy modalities.
- Understand the working of different devices used in Electrotherapy Modalities

Course Contents: All sections carry equal weightage. All topics are for a brief description only.

Section – A

Fundamentals of Electricity & Magnetism

1. 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
2. A. C. currents: Sinusoidal wave from, frequency, wavelength, Amplitude and phase of a sine wave, Average & RMS value of a sine wave
3. Quantity of electricity, magnitude of current, conductors and insulators, resistance of conductor and Ohm's law, resistances in series and parallel
4. Capacitors: Electric field around a capacitor, charging and discharging a capacitor, types of capacitor with application of each in Physiotherapy department
5. Rheostat: series and shunt Rheostat with application of each in the Physiotherapy department
6. Effects of electric Current: Thermal effect, chemical effect (ionization) and magnetic effect. Electric shock, Earth shock, causes and its prevention

7. 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.

Section – B

1. Thermionic Valves: Thermionic emission, Diode and Triode valves and their characteristics, Construction and application of Cathode Ray Oscilloscope
2. Semiconductor Devices: Intrinsic and extrinsic semiconductors, advantages of diode and transistors devices. Basing of Diode and their characteristics, Light Emitting Diodes, integrated circuits
3. Electronic Circuits: Rectifiers & smoothing circuits, Oscillators - Sinusoidal and non-sinusoidal types
4. A.C. AND D.C. meters: Functions and applications of Ammeter and volt meters, Ohmmeters, Wheat stone bridge
5. Introduction to Therapeutic Energies – Thermal, Mechanical, Electrical, Electromagnetic and magnetic - Definition, description, physiological effects, pathological effects and dangers.

Section – C

1. Medical Instrumentation For Physical Therapy: Brief description of generation, circuit diagrams and testing
2. Low frequency currents, Direct currents, Medium frequency currents
3. Short wave Diathermy-continuous and pulsed
4. Microwave Diathermy
5. Ultrasound
6. Actino-therapy - Infrared, UVR and Lasers

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

Suggested Readings:

S.No.	Author	Title	Publisher	Year	Vol.
1	Froster, A. and Palastanga, N.	Clayton's Electrotherapy: Theory and Practice	AITBS, Delhi	1999	
2	Jhon, Low and Ann, Reed	Electrotherapy Explained: Principles	Butterworth Heine, Oxford	2000	
3	Nelson, R.M. and Currier, D.P.	Clinical Electrotherapy	Appleton and Lange	1987	
4	Chemeron, M.H.	Physical Agents in Rehabilitation	W B Saunders, London	1999	
5	Michlovitz, S L	Thermal Agents in Rehabilitation	F A Davis, Philadelphia	1996	

BIOCHEMISTRY

Course/Paper: 01BTP106

BPT YEAR-I

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.

Learning Outcomes:

- Able to demonstrate an understanding of fundamental biochemical principles, such as the structure/function of biomolecules, metabolic pathways, and the regulation of biological/biochemical processes.
- Understand and practice the ethics surrounding scientific research.
- Able to apply and effectively communicate scientific reasoning and data analysis in both written and oral forums.

Course Contents: All sections carry equal weightage.

Section – A

1. Nutrition: Basic principles of nutrition; Carbohydrates, Proteins and Lipid caloric requirement and balance diet.
2. Carbohydrates: Definition, classification with examples and general functions. Metabolism - Glycolysis, T.C.A Glycogen metabolism, Blood Sugar regulation, Diabetes and diabetic keto-acidosis
3. Lipids: Definition, classifications and general functions. Essential fatty acids, cholesterol, Blood lipids. Brief review of lipoproteins. Metabolism-Oxidation of fatty acids, cholesterol synthesis, and fatty liver.
4. Proteins: Definition, classification, and Bio-medical Importance.

Section – B

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

Section – C

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

Suggested Readings:

S.No.	Author	Title	Publisher	Year	Vol.
1	Ahuja, Lakshmi	CBS Quick Review in Biochemistry	CBS, New Delhi	1999	

2	Chatterji, M N	Text Book of Medical Biochemistry	Jaypee, Bangalore	1999	
3	Deb, A.C.	Fundamentals of Biochemistry	CBA, Calcutta	1999	
4	Lehninger, A.L.	Principles of Biochemistry	CBS, Delhi	1984	

PRACTICAL ANATOMY

Course/Paper: 01BTP201

BPT YEAR-I

Learning of surface landmarks with special emphasis on bones, joints, muscles, and nerves. The 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.

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

PRACTICAL PHYSIOLOGY

Course/Paper: 01BTP202

BPT YEAR-I

Examination of pulse, B.P., respiratory rate, & measure study the effect of posture & exercise.

Spirometry to measure various lung capacities & volumes, Respiratory rate, tidal volume, VC, timed VC, IRV, IC, ERV, EC on Spirometry (demonstration only)

Estimate of Haemoglobin, T.R.B.C., T.W.B.C. count (demonstration only)

Blood indices, Blood grouping, Bleeding & Clotting time (demonstration only)

Students will be assessed by viva based upon learning in theory. Demonstration of measurements of pulse, BP.

PRACTICAL FUNDAMENTALS OF BIOMECHANICS & EXERCISE THERAPY

Course/Paper: 01BTP203

BPT YEAR-I

Demonstration of Biomechanical principles

Study of structure, function and application of various Biomechanical modalities - shoulder wheel, shoulder ladder, shoulder pulleys, pronator- supinator instrument, static cycle, rowing machine, ankle exerciser, balancing board, springs, weights, etc. Study of structure, function and application of suspensions, Demonstration and practice of

- soft tissue manipulative techniques
- normal gait and posture

- starting and derived positions
- spinal mechanical traction

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

YEAR II

PATHOLOGY & MICROBIOLOGY

Course/Paper: 02BTP101

BPT YEAR-II

Course objectives:

Rationale for understanding of the subject for Physiotherapy students

Brief concept of pathological basis of disease and infectious disease prevention

Learning Outcomes:

- Explain within multiple microbiology disciplines the core theories and practices;
- Explain the processes used by microorganisms for their replication, survival, and interaction with their environment, hosts, and host populations;
- Explain the theoretical basis of the tools, technologies and methods common to microbiology

Course Contents: All sections carry equal weightage

PATHOLOGY

Section – A

- a) Inflammation, injury and repair
- b) Oncology: Classification, gross pathological state, cancer pain syndrome (Brief description)
- c) Skin: Etio-pathogenesis, gross pathology of commonly occurring skin Diseases, Burns, Pressure ulcers (Brief description)
- d) Cardiovascular system: Etio-pathogenesis, gross pathology of conditions- aging, IHD, MI, CCF, HT, RHD, Congenital heart disease, Arteriosclerosis, Thrombo-angitis, Vasomotor-Raynaud's, venous thrombosis, Gangrene, Lymph edema
- e) Haematology: (Brief description) – Etio-pathogenesis, gross pathology of conditions-anaemia, polycythaemia, leukaemia, haemolytic disease, and haemophilia
- f) Respiratory system: Etio-pathogenesis, gross pathology of conditions - aging, Pneumonia, Pulmonary TB, Bronchiectasis, COPD, Bronchial Asthma, Restrictive Lung disease, Occupational lung disease

Section – B

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

MICROBIOLOGY

Section – C

- a) Immunology: Brief description of immune system, immunity, immune responses & immune deficiency
Immunology, Hypersensitivity disorders

- b) Infectious diseases: Brief description of classification of microorganisms, identification, Sterilization and disinfections with special reference to principles of antiseptics and prevention of communicable diseases in clinical practice
- c) Brief description of identification of infectious diseases; principles of prevention of infectious diseases caused by common 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

Suggested Readings:

S.No.	Author	Title	Publisher	Year	Vol.
1	Chakraborty, P.	Textbook of Microbiology	NCB, Calcutta	1999	
2	Ananth Narayan, R.	Text Book of Microbiology	Orient Longman, Madras	1986	
3	Chatterjee, K. D.	Parasitology: Protozoology and helminthology	Chatterjee, Calcutta	1965	
4	Cotran, Ramzi S	Pathologic Basis of Disease	W. B. Saunders, Singapore	1999	
5	Vinay Kumar	Basic Pathology	Harcourt	1997	
6	Nagalotimath, S.J.	Textbook of Pathology	CBS, New Delhi	1998	
7	Talib, V. H.	Essential Parasitology	Mehta, New Delhi	2001	

PHARMACOLOGY

Course/Paper: 02BTP102

BPT YEAR-II

Course Objectives:

- b) To understand pharmaco-kinetics, pharmaco-dynamics.
- c) Usage of common drugs with (indications, contraindications, side effects).
- d) To understand the drug actions that may affect the physical therapy treatment.
- e) Course is not prescription oriented.

Learning Outcomes:

- To understand the fundamental scientific principles of drug action and the various mechanisms by which drugs can mediate their pharmacological effect
- To understand the fundamental principles of pharmacokinetics that underly the absorption, distribution, metabolism and elimination of drugs in the body and thereby affect drug effectiveness
- To understand the biochemical reactions that result in the metabolism of drugs within the body

Course Contents: All sections carry equal weightage

Section – A

1. General Pharmacology (brief description only):
 - Introduction & general concepts
 - Pharmaco-kinetics (routes of administration, metabolism & elimination)
 - Pharmaco-dynamics (mechanism of drug action, therapeutic & side effects, toxicity)
2. Autonomic Nervous System:
 - Brief outline of Sympathetic-parasympathetic nervous system
 - Therapeutic agents-uses, effects and interaction with physical therapy
3. Central Nervous System:
 - Anaesthetic agents- uses, side effects and interaction with physical therapy
 - Sedatives and hypnotics - uses, side effects and interaction with physical therapy
 - Anti epileptic drugs- uses, side effects and interaction with physical therapy
 - Analgesics - uses, side effects and interaction with physical therapy
 - Anti inflammatory drugs- uses, side effects and interaction with physical therapy
 - Psychotherapeutic agents- uses, side effects and interaction with physical therapy
 - Alcoholism and drug dependence and interaction with physical therapy
 - Therapeutic agents used for movement disorders- uses, side effects and interaction with physical therapy

Section – B

1. Cardio-vascular System:
 - Therapeutic agents (classification, effects on cardio-vascular system, uses & adverse reactions)
 - Drugs used in cardiac failure, hypertension & arrhythmias and interaction with physical therapy
 - Drug therapy in vascular disease & ischaemia and interaction with physical therapy
2. Respiratory system:
 - Therapeutic agents - uses, side effects and interaction with physical therapy

Section – C

6. Gastrointestinal system:
 - Therapeutic agents in Peptic ulcer, Diarrhoea- uses, side effects and interaction with physical therapy
 - a. Endocrinal hormones: Thyroid, adrenal, parathyroid hormones – uses, side effects and interaction with physical therapy
 - b. Diabetes mellitus;
- Drug therapy and its interaction with physical therapy
9. Geriatrics:
Pharmacological challenges in geriatric age group and its effects on physical therapy
- Suggested Readings:

S.No.	Author	Title	Publisher	Year	Vol.
1	Tripathi, K.D.	Essential of Medical Pharmacology	New Delhi,	1985	
2	Laurence, D.R.	Clinical Pharmacology	ELBS, London	1975	
3	Eddy, Lynne	Physical Therapy pharmacology	Mosby, London	1992	
4	Barbar, F.S.K.	Essential. Of Pharmacotherapeutics	S. Chand, New Delhi	2000	

MEDICINE & PAEDIATRICS

Course/Paper: 02BPT01103

BPT YEAR-II

Course Objectives:

- a. To understand the subject of medicine, the medical patient & implications of medical condition in physical therapy
- b. To understand a Paediatrics patient and its special needs in relation to physical therapy

Learning Outcomes:

- Demonstrate a systematic, integrated and effective evidence-based approach to problem solving in the diagnosis and management of diseases and disorders.
- Health maintenance and preventive care for children, including age-related issues in nutrition, safety, vaccination and risk factor identification and modification

Course Contents: All sections carry equal weightage

MEDICINE

Section – A

1. Introduction: Brief outline of subject of medicine, a medical patient, common signs & symptoms of disease
2. Infectious Diseases: Brief description of concept of infection, types, classification & common clinical manifestation of infection and general principle of management (No specific infections)
3. Nutritional & Metabolic Diseases: Brief description of following diseases along with outline of management: Diabetes Mellitus, Vitamins (A, B, C, D & K) and Minerals (iron, calcium phosphorus, iodine) deficiencies, and Obesity
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
5. Brief description of liver diseases along with outline of management: Hepatitis, & Jaundice
6. Diseases of the blood: Brief description of manifestations along with outline of management of common blood diseases - Anaemia, Leukaemia, Coagulopathy
7. Diseases of connective tissues: Brief description of manifestations along with outline of management of - SLE, polymyositis
8. Diseases of skin: Brief description of manifestations along with outline of management of common skin diseases - scabies, pediculosis, taeniasis, impetigo & psoriasis
9. Geriatrics- physiology of ageing, manifestations of diseases in old people and general principles of management. Implications of aging in physical therapy. lung disease, Pleurisy & Pulmonary embolism
10. First Aid in common Medical Emergencies

Section – B

- Cardio-vascular System: Manifestations of heart & vascular disease & general principle of diagnosis. Brief description of following diseases along with outline of management: Cardiac failure, Ischaemic heart disease, hypertension, atherosclerosis, Deep vein thrombosis
- Respiratory System: Manifestations of respiratory disease & general principle of diagnosis. 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

PAEDIATRICS

Section – C

- Normal Growth and development of child – motor, mental, language and social
- Pathological presentations of growth and development disorders
- Common infectious diseases in children: Brief description of following infectious diseases along with outline of management: Tetanus, diphtheria, Mycobacterial, measles, chicken pox, gastroenteritis, HIV, and Malaria
- Immunization programmes – WHO schedule, different vaccinations, rationale; special consideration to various disease eradication programmes like Pulse-Polio
- Child and nutrition - Nutritional requirements, malnutrition syndrome, Vitamins (A, B, C, D & K) and Minerals (iron, calcium phosphorus, iodine) deficiencies in children and management in brief
- Clinical presentation, management & prevention of the following: - Cerebral palsy, Poliomyelitis, Muscular dystrophy
- Childhood rheumatism-types, clinical presentation, & management in brief
- Acute CNS infections: clinical presentation, complications and management of bacterial and tubercular infections in brief
- Clinical presentation, management & prevention of the following respiratory conditions: URI, LRI, bronchiolitis, asthma, TB (in brief)
- Clinical presentation, management & prevention of the following cardiac conditions: Rheumatic heart disease, SABA, Congenital heart disease - ASD, VSD, PDA (in brief)

Suggested Readings:

S.No.	Author	Title	Publisher	Year	Vol.
1	Chemberlin, E.N. and Ogilvie, C.	Symptoms and signs in Clinical Medicine	Jhon Wright	1974	
2	Swash, Michael	Hutchison's Clinical Methods	W B Saunders, London	2000	
3	Ghai, O. P.	Essential Pediatrics	Interprint, New Delhi	1987	
4	Haslett, C.	Davidson's Principal and Practice of Medicine	Churchill Livingstone, London	1999	
5	Golwalla, Aspi F.	Medicine For Student	NBD, Mumbai	2003	
6	Behrman, R.	Nelson's Text Book of Pediatrics	W B Saunders, London	2001	2V
7	Kasper, D.L	Harrison 's Principles of Internal Medicine	Mc-Graw Hill, New York	2005	2V

GENERAL SURGERY

Course/Paper: o2BTP104

BPT YEAR-II

Course Objectives:

- To understand common surgical conditions & surgical procedures.
- To understand implication of surgical conditions, procedures on physical therapy.

Learning Outcomes:

- Demonstrate knowledge and understanding of common surgical problems
- Understand the indications for, and the limitations of, essential diagnostic studies used to evaluate patients with surgical problems
- Demonstrate an understanding of surgical treatments, and alternatives to surgical treatment

Course Contents: All sections carry equal weightage

Section – A

- Introduction to Surgery, surgical patient, principles of surgical examination (Brief description)
- Anesthesia: Brief description of events of General Anesthesia, potential complications & outline of management
- Common types of wounds, scars, ulcers, boils – clinical feature and out line of treatment
- Burns: causes, classification, complications, conservative management of patients. Management of burns & wound scars
- Brief outline of nutritional support, pain relief of a surgical patient
- Abdominal wall: brief surgical anatomy
- Brief description of various types of abdominal incisions, external opening of abdominal viscera (colostomy) resultant potential complications and management
- Brief description of causes, clinical presentation and management of various types of hernias
- General principles of plastic surgery and postoperative management

Section – B

- Cranium:
 - Head injuries – classification, clinical features, complications & management
 - Intra-cranial disorders – clinical features, complications & management of brain abscess, space occupying lesion, hydrocephalus, vascular malformation (brief)
- Nerve injuries – causes, clinical features of Cranial (V, VII) & peripheral nerve injuries (major nerves), complications & management
- Vertebral column injuries – classification, clinical features, complications & management

Section – C

- Vascular Disorders: clinical features, complication & management of Arterial occlusion, dilatations, arteritis, small vessel abnormalities
 - Gangrene – classification, brief clinical features & management
 - Amputations – causes & types
 - Superficial & deep vein thrombosis – pathogenesis, prevention & management. Lymph edema – brief outline of causes, clinical features & management

Thorax:

- a. Chest injuries – classification, causes, clinical features, complications & management Pulmonary resection – causes, outline of surgical management, pneumothorax, haemo - pneumothorax
- b. Heart: - brief description of various surgical heart diseases with respect to clinical presentation, complications and management - valvular heart disease, congenital heart disease –e.g., ASD, VSD, PDA, Ischaemic heart disease. Outline of postoperative complications in cardiac surgery and their management
- Brief description of first aid principles of cardio-pulmonary resuscitation and trauma

Suggested Readings:

S.No.	Author	Title	Publisher	Year	Vol.
1	Russell, R.C.G.	Short practice In Surgery	Arnold, London	2000	
2	Gupta, R. L.	Text Book of Surgery	Jaypee, New Delhi	1996	

EXERCISE THERAPY

Course/Paper: 02BTP105

BPT YEAR-II

Course Objectives:

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

Learning outcomes:

- Integrate knowledge of basic sciences and physical therapy in order to modify treatment approaches that reflect the breadth and scope of physical therapy practice.
- Integrate the use of basic principles of research in critical analysis of concepts and findings generated by self and others.
- Actively recognize the rights and dignity of individuals in planning and administering programs of care.

Course Contents: All sections carry equal weightage

Section – A

- Manual Muscle Testing:
Concept, introduction, significance and limitations.
Grade systems
Techniques of Muscle testing.
Emphasis on skills to grade upper, lower limb, neck and trunk muscles including trick movements.
- Goniometry
Measurement of various joints range in normal and disease condition.
Different techniques of goniometry.
Limb length measurements
- Passive movements:
Definition
Relaxed, forced and stretching type.
Indications, contraindications, advantages and Techniques of various passive movements.
- Active movements:

Free, assisted and resisted

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.

Section – B

- 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, and long flexors of fingers. Rectus femoris, Ilio-tibial band, gastrocnemius-soleus, hamstrings, hip abductors, ilio-psoas. Sternocleidomastoid
- 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.
- Joint Mobility:
 - Joint range, stiffness, range and limitations
 - Accessory movements- glides, traction and approximation
 - Mobilization of peripheral, spinal joints, techniques and grading in detail.
- 1. Re-education of muscles:
 - Concept, technique, spatial and temporal summation.
 - Various reduction techniques and facilitating methods.
 - Progressive strengthening of various muscle groups in Grade-I-Grade IV.
 - Muscle strengthening technique – PNF - Principles of PNF, indications, contra indications, techniques, limb patterns
- 2. Co-ordination:
 - Balance – static and Dynamic
 - Discoordination: LMNL & UMNL, cerebellar lesion, loss of kinesthetic sense (Tabes-dorsalis, leprosy, syringomyelia)
 - Reeducation of balance and coordination: PNF and Frenkel's exercises.

Section – C

- Crutch Walking:
 - Description of crutch - components, classification
 - Good crutch, measurements
 - Crutch use- Preparation, Training, counseling.
 - Crutch gaits- types, & significance.
 - Crutch complications- Palsy, dependency etc.
- Hydrostatics and Hydrodynamics:
 - History
 - 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
- Hydrotherapy:
 - Indication, contraindication, benefits, dangers and precautions
 - Hydrotherapy regimes of exercises,
 - Hydrotherapy exercise for all age groups
 - Types of pools and baths
- Suspension Therapy:
 - Principles of suspension & types
 - Components
 - Effects and uses & therapeutic application
- Yogasanas and Pranayama:
 - Physiology and therapeutic principles of yoga,
 - Yogasana for physical culture, relaxation and medication.
 - Application of yogasana in physical fitness, flexibility.
 - Therapeutic application of yoga. Yoga a holistic approach

Suggested Readings:

S. No.	Author	Title	Publisher	Year	Vol.
1	Hollis, M. and Cook, P.F.	Practical Exercise Therapy	Blackwell, Oxford	1999	
2	Gardiner, Dena M.	Principles of Exercise Therapy	CBS, New Delhi	1999	
3	Lippert, Lynn	Clinical Kinesiology for Physical Therapy	Jaypee, New Delhi	1996	
4	Paliarulo, M. A.	Introduction to Physical Therapy	Mosby, London	2001	
5	Jones and Barker,	Human Movement Explained	Butter worth- Heine	2000	
6	Thomson, Ann	Tidy's Physiotherapy	Varghese, Mumbai	1991	
7	Hislop, H.J. and Montgomery, J.	Daniels and Worthingham's Muscle Testing: Techniques of Manual Examination	W.B.Saunders, Philadelphia	2002	
8	Norkin	Measurement of Joint Motion			
9	Kisner, C. and Kolby, L.A.	Therapeutic Exercise Foundation and Technique	Jaypee, New Delhi	1996	
10	Holey, E. and Cook, E.	Therapeutic Massage	Harcourt, Singapore	1998	
11	Bates, Andrea and Hanson, Norm	Aquatic Exercise Therapy	W.B.Saunders, Philedelphia	1996	
12	Kendal, F.P.	Muscles Testing and Function	Lippincott, New York	1993	
13	Campion, M. R.	Hydrotherapy: principles and Practice	Butterworth, Oxford	2000	
14	Perry, Jan F	Kinesiology Workbook	F A Davis, Philadelphia	1996	

15	Adler, S.S.	PNF in Practice	Springer, New York	2003	
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ELECTROTHERAPY

Course/Paper: o2BTP106

BPT YEAR-II

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.

Learning Outcomes:

- Describe the basic of Physics which is used in Electrotherapy Modalities,
- Explain the electrical supply of Electrotherapy modalities.
- Understand the working of different devices used in Electrotherapy Modalities

Course Contents: All sections carry equal weightage

Section – A

- **LOW FREQUENCY CURRENTS: Nerve Muscle Physiology:** brief outline Faradic current: Indications, contraindications, Techniques, parameters, Group muscle stimulation. Faradic footbath, Faradism under pressure and muscle re-education. Dosimetry

Galvanic current:

- Indications, contraindications, precautions and therapeutic effects of stimulation.
- Techniques, parameters, Dosimetry

Electro-Diagnosis:

1. S. D. Curve, Reaction of degeneration, Chronaxie & Rheobase
2. Outline of EMG & Nerve conduction velocity

Iontophoresis:

- Definition and principles & factors
- Indications, effects, techniques, contraindications, precautions and Potential harmful effects.

TENS therapy:

Principle of therapy, Parameters and therapeutic uses.
Theories of pain and pain control.
Indications and contra-indications, Dosimetry

B.MEDIUM FREQUENCY CURRENTS:

Definitions, effects, indications, techniques of application, contraindications

Interferential therapy:

- Physiological, therapeutic effects & dangers, Indications & contra indications
- Technique and method of applications, Dosimetry.

Section – B

- **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.

- Cold-therapy:

Indications, contraindications and therapeutic effects.

Technique, precautions and Potential harmful effects of treatment, Dosimetry

D.HIGH FREQUENCY CURRENTS:

Short wave Diathermy: Continuous & Pulsed

- i. Indications, contraindications and therapeutic effects.
- ii. Methods of application-capacitor and induction electrode, precautions and Potential harmful effects of treatment, Dosimetry.

Microwave Diathermy:

- Characteristics and therapeutic effects.
- Application techniques, indications, contraindications, precautions and potential harmful effects, Dosimetry.

Section – C

- ii. **ULTRASONIC THERAPY:**
Physiological and therapeutic effects & potential harmful effects.
Indications, contraindications, methods of application and precautions, Dosimetry

iii. **ACTINOTHERAPY:**

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

- **Advanced electrotherapy:**

Computerization of modalities

Programming of parameter.

Selection and combination of parameters.

Combined therapy-U.S.+TENS-Principles, uses, indications etc.

Principles of Bio-feed back, indications & uses.

- **Traction instruments:**

Rationale, technique, indications, contraindications, precautions of electric traction equipments

Suggested Readings:

S.No.	Author	Title	Publisher	Year	Vol.
1	Froster, A. and Palastanga, N.	Clayton's Electrotherapy: Theory and Practice	AITBS, Delhi	1999	
2	Jhon, Low and Ann, Reed	Electrotherapy Explained: Principles	Butterworth Heine, Oxford	2000	
3	Nelson, R.M. and Currier, D.P.	Clinical Electrotherapy	Appleton and Lange	1987	
4	Chemeron, M.H.	Physical Agents in Rehabilitation	W B Saunders, London	1999	
5	Michlovitz, S L	Thermal Agents in Rehabilitation	F A Davis, Philadelphia	1996	

PRACTICAL PT - CLINICALS

Course/Paper: 02BTP201

BPT YEAR-II

The student will learn - Approach to patient, collection of demographic data, art of history taking and bedside / OPD manners in relation to patient

The student will be posted in the department of Physiotherapy & he/she will do the assessment of patients visiting the department.

There will be no university examination. The students will be awarded marks on the basis of his/her attendance & performance during clinical postings in the department of Physiotherapy.

PRACTICAL EXERCISE THERAPY

Course/Paper: 02BTP202

BPT YEAR-II

Demonstration and learning of active & passive movements of Limbs and spine Demonstration and practice of Manual Muscle testing, Goniometry Demonstration and practice of muscle stretching techniques Demonstration and practice of muscle strengthening techniques Demonstration and practice of muscle reeducation techniques Demonstration and practice of coordination exercises (Frankel's) Demonstration and practice of relaxation techniques Demonstration and practice of mobilization of peripheral joints practice of crutch gaits Demonstration and practice of mechanical spinal traction Demonstration and practice of suspension techniques

Students will be assessed by viva & practical demonstrations based upon learning in theory & practical classes.

PRACTICAL ELECTROTHERAPY

Course/Paper: 02BTP203

BPT YEAR-II

Demonstration of Electrical Modalities functioning & Usage. Demonstration and practice of various motor point stimulations. Demonstration and practice of therapeutic application of different low frequency currents. Demonstration and practice of Reaction of degeneration, SD curves plotting. Demonstration and practice of therapeutic application of the following modalities: Short-wave diathermy, Ultrasound, Infra red, Wax bath, Hydro collator, Electric muscle stimulator, Interferential currents, TENS, Ultraviolet, Microwave, Lasers, and Electrical Traction.

Students will be assessed by viva & practical demonstrations based upon learning in Theory and Practical.

YEAR III

NEUROLOGY INCLUDING PSYCHIATRY

Course/Paper: 03BTP101

BPT YEAR-III

Course Objectives:

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

Learning Objectives:

- Recognize symptoms that may signify neurologic disease (including disturbances of consciousness, cognition, language, vision, hearing, equilibrium, motor function, somatic sensation, and autonomic function)
- Demonstrate awareness of the use and interpretation of common tests used in diagnosing neurologic disease
- Apply the principles underlying a systematic approach to the management of common neurologic diseases (including the recognition and management of situations that are potential emergencies)
- Integrate basic science information (neurophysiology, neuroanatomy, neuropharmacology, and neuropathology) to clinical correlates.
- Describe key aspect of brain, spinal cord, peripheral nerves and muscle diseases clinical, pharmacologic, anatomical, pathology, causes, prognosis and management

Course Contents: All sections carry equal weightage

Section – A (Neurology)

- a. 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
- b. Clinical examination of a neurological patient
- c. General manifestations of nervous system disease & principles of diagnosis & management
- d. Brief Description of Headache, migraine, raised intra-cranial pressure
- e. Cranial Nerves and special senses with major emphasis on V, VII, X, XI, & XII
- f. Inflammatory conditions (brief description) – meningitis (bacterial, tubercular), viral encephalitis, syphilis, rabies
- g. Disorders of cerebral circulation - ischaemia, haemorrhages (CVA), HT encephalopathy
- h. Demyelinating diseases (brief description) - acute disseminated encephalomyelitis, multiple sclerosis
- i. Extra pyramidal syndromes - Parkinson's disease, Chorea, Athetosis, Dystonia, Hemi-ballismus, Spasmodic Torticollis
- j. Convulsive disorders (brief description) - epilepsy (GM, PM, Psychomotor), tetany
- k. Developmental and degenerative syndromes – cerebral palsy, kernicterus, hereditary ataxias, motor neuron disease, Peroneal muscular atrophy

Section – B

1. Disorders of Spinal cord and Cauda Equina- spinal cord injury, paraplegia, quadriplegia, spina-bifida, transverse myelitis, Neurogenic bladder and bowel
2. Metabolic and intoxication disorders (brief description) - Alcoholism, Drug addiction, heavy metals poisoning (lead, mercury, copper), Organo-phosphorous poisoning, electric shock, tetanus, botulism
3. 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
4. Muscle disorders – Progressive muscular dystrophy, polymyositis, myasthenia gravis, floppy infant syndrome
5. Autonomic nervous system (brief description)– clinical features of autonomic disorders, autonomic dysreflexia, autonomic nervous system and pain

Section – C (Psychiatry) (Brief outline only)

1. Principles of psychiatric examination
2. Modalities of psychiatric treatment
3. Psychiatric illness and physical therapy link
4. Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illnesses
 - Anxiety neurosis
 - Depression
 - Obsessive compulsive neurosis
 - Psychosis
 - Maniac-depressive psychosis
 - Drug induced psychosis
 - Post-traumatic stress disorder
 - Psychosomatic reactions: Stress and Health, theories of Stress – Illness Link
5. Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illnesses-
 - Organic brain syndrome
 - Dementia
 - Drug dependence and alcoholism
 - Somatoform and Dissociate Disorders – conversion reactions, Somatization, Dissociate Amnesia, and Dissociate Fugue
 - Multiple Personality & Depersonalization disorder
6. Child psychiatry: Brief descriptions of manifestations, and management of childhood disorders - attention deficit syndrome, and behavioral disorders
7. Geriatric Psychiatry
8. Mental deficiency- (descriptive)
 - Mental retardation,
 - Learning disabilities
 - Autistic behavior

Suggested Readings:

S. No.	Author	Title	Publisher	Year	Vol.
1	Bannister, R.	Brain and Bannister Clinical Neurology	Oxford university press, oxford	2002	
2	Chamberlain, E.N.	Symptoms and Signs in Clinical Medicine	John Wright, Bristol	1974	
3	Friedman, H.H.	Problem-Oriented Medical Diagnosis	Little Browne, Boston	1979	3V
4	Swash, Michael	Hutchison's Clinical Method	W B Saunders, London	2000	
5	Rees, Lingford	New Short Text Book Of psychiatry	Arnold, New Delhi	1988	
6	Walton, John	Brain's Disease of the Nervous System	Oxford university press, Delhi	1998	
7	Haerer, A.F.	Neurological Examination	Lippincott, Philedelphia	1999	
8	Ahuja, Neeraj	Short Text Book Of psychiatry	Jaypee, New Delhi	1999	
9	Haslett, C.	Davidson's Principal and Practice of Medicine	Churchill Living stone, London	1999	
10	Kasper, D.L	Harrison 's Principles of Internal Medicine	Mc-Graw Hill, New York	2005	2V

ORTHOPAEDICS

Course/Paper: 03BTP102

BPT YEAR-III

Course objectives:

1. To understand an orthopaedic patient, common orthopaedic conditions and procedures
2. To understand applications of physical therapy in various orthopaedic conditions
3. To understand the implications of various orthopaedic conditions, and procedures on physical therapy

Learning Objectives:

- Gain in depth knowledge of surgical techniques for variety of joints. I.e shoulder, hip, knee, ankle observation.
- Consolidate knowledge of basic orthopaedic procedures and their normal post op physio protocol.
- Develop knowledge of initial assessment and differential diagnosis. Spend time observing consultants for a variety of joints.
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Course Contents: All sections carry equal weightage

Section – A

1. Introduction to Orthopaedics: An Orthopaedic patient, history taking, clinical features, clinical examination, and investigation
 2. Fracture healing (Normal & pathological)
Calcium-phosphorus metabolism - normal and pathological states
 3. Congenital malformations:
Brief descriptions of following congenital conditions along with the outline of treatment: Congenital Hip Displasia, Congenital Talipes Equinovarus / Calcaneo valgus, Arthrogryposis Multiplex Congenita, Congenital Torticollis, Acromelia, phocomelia, Amelia, Spina Bifida: all types, clinical presentation, sequel & management
 4. Development diseases of skeleton: (Brief description only)
Osteogenesis imperfecta, heterotopic ossification, Osteochondritis, Perthes' disease 5. Neuromuscular diseases: Volkmann's Ischaemic contracture, obstetrical paralysis, and peroneal muscular atrophy
- Poliomyelitis – orthopaedic aspects and treatment of deformities
1. Spinal deformities: clinical features, diagnosis & Conservative management of Scoliosis, Kyphosis, and traumatic deformities
 2. Infections of Musculoskeletal system with conservative management (in brief):
Bacterial infections
Tubercular infections
Leprosy, Pott's paraplegia
 3. Neuro-vascular Diseases (Brief Description): orthopaedic aspects and treatment of - Nerve injuries (major nerves), Plexus injuries

Section – B

- Arthritis & Rheumatic Diseases: Clinical features, evaluation & conservative management of various categories of arthritis
Rheumatoid arthritis, Juvenile Ch. Arthritis, Reiter's disease
Polymyalgia rheumatica,
Gout,
Osteoarthritis,
Ankylosing spondylitis,
Neuropathic- joints, haemophilic arthropathy,
Avascular necrosis.
- Bony & Soft tissue injuries: Injury & repair, Clinical presentation, evaluation & general principles of rehabilitation management (Brief Description)
- Upper Limbs: Clinical presentation, evaluation & conservative management of rotator cuff injuries, adhesive capsulitis, bursitis, biceps tendonitis, shoulder dislocation, snapping & winged scapula, tennis and golfer elbow, olecranon bursitis, soft tissue injuries, sprains and strains, Arthritic conditions, tenosynovitis, Carpal tunnel syndrome, deformities Dupuytren's contracture, VIC, reflex sympathetic dystrophy, common fractures and dislocations

Section – C

- Lower Limb: Clinical presentation, evaluation and conservative management of Arthritic conditions, soft tissue injuries, sprains and strains, achilles tendonitis, bursitis, plantar fasciitis, deformities, reflex sympathetic dystrophy, neuropathic Joints, common fractures and dislocations
- Spine: clinical presentation, evaluation and conservative management of – disc prolapse, cord compression, spondylosis, Ankylosing spondylosis, Spondylyolsthesis and Spinal Fractures
- Amputations - Justification, outline of surgical approaches, incisions, procedures, indications, contraindications, complications & management.

Suggested Readings:

S.No.	Author	Title	Publisher	Year	Vol.
1	Joshi, J. and Kotwal, P.	Essential Of Orthopedics and Applied Physiotherapy	Elsevier, New Delhi	2004	
2	Terke, Samuel L.	Orthopedics: principles and their application	Lippencott, New York	2000	2V
3	Magee, David J.	Orthopedic and Physical Assessment	Saunders, Philadelphia	2002	
4	Maheshwari, J	Essential Orthopedics			
5	Solomon, Louis	Apley's Systems of Orthopedics and Fracture	Arnold, London	2001	
6	McRae, R. and Esser, Max	Practical Fracture Treatment	Churchill Living stone, London	2002	

OBSTETRICS AND GYNECOLOGY

Course/Paper: 03BTP103

BPT YEAR-III

Course objectives:

To understand common gynaecological conditions and procedures (in brief) To understand implications of gynaecological conditions and procedures on physical therapy

Learning objectives:

- Perform the medical interview and physical examination of women incorporating ethical, social, and diversity perspectives to provide culturally competent health care
- Analyze the impact of genetics, medical conditions, and environmental factors on maternal health and fetal development
- Distinguish between normal and abnormal physiologic changes during pregnancy

Course Contents:

1. Brief Anatomy and physiology of female reproductive system
2. Basic principles of clinical examination, investigation, diagnosis, prognosis of female reproductive system disorders Menstruation and its disorders
3. Physiological changes during pregnancy
4. Labour, stages of labour & delivery
5. Musculo-skeletal problems in an obstetric patient, management

6. Prenatal and post-natal care
7. Pelvic inflammatory diseases
8. Prolapse uterus, urinary incontinence, causes & management
9. Abortion and birth control
10. Tumor of the reproductive systems, management
11. Surgical consideration in obstetrics and gynecology

Suggested Readings:

S.No.	Author	Title	Publisher	Year	Vol.
1	Howkins, John	Shaw's Textbook of Gynecology	Orient-Longman, Bangalore	1971	
2	Datta, D.C.	Textbook of Obstetrics	NCBA, Calcutta	2000	
3	Mudaliar, A.L.	Clinical Obstetrics	Orient-Long main, Bangalore	1972	
4	Percival, Robert	Manual of Obstetrics	ELBS, London	1973	

APPLIED BIO-MECHANICS & KINESIOLOGY

Course/Paper: 03BTP104

BPT YEAR-III

Course objectives:

To understand the Musculoskeletal surgical anatomy normal and pathological deviations

Learning Outcomes:

- Apply knowledge of the underlying principles and concepts of Exercise and Sport Science. Including the core areas of: Human Physiology, Anatomy, Functional Anatomy, Exercise Physiology, Biomechanics, Motor Learning and Control, Exercise Metabolism and Nutrition, and Psychology .
- Utilise core instrumentation and equipment for the monitoring and assessment of exercise clients .
- Review, analyse and interpret information, and independently generate conclusions

Course Contents: All sections carry equal weightage

Section – A

1. Joint structure and function
 - Types of joints
 - Joint functions
2. Kinesiology:
 - Origin of human movement and its significances
 - Analysis of movement – kinetics and kinematics
 - Body links and motion parts
3. General effects of injury and disease on joint functioning
 - Brief surgical anatomy (structural components, and alignment)
 - Joint range of motion, axis and plane of motion
 - Joint movements, mobility and stability, restrictions and limitations, end feels
 - Abnormal deviations in joints in disease and injury

Of the following joint complexes:

Shoulder joint complex Elbow joint complex

Section – B

- General effects of injury and disease on joint functioning
 - Brief surgical anatomy (structural components, and alignment)
 - Joint range of motion, axis and plane of motion
 - Joint movements, mobility and stability, restrictions and limitations, end feels
 - Abnormal deviations in joints in disease and injury
 - Weight distribution (lower limb joints)

Of the following joint complexes:

Wrist and hand complex Hip joint complex

Knee joint complex: Ankle-foot complex: Vertebral column

Section – C

- Abnormal Posture:
 - Definition and description.
 - Analysis of postures (anterior, lateral and posterior), alignment of joints in different postural deviations.
 - Abnormal postures – biomechanical analysis and effects.
 - Principles of Postural correction
- Pathological Gait:
 - Phases of gait – biomechanical analysis.
 - Time and distance parameters – biomechanical significance.
 - Joint motion – chains of movement
 - Effects of pain, deformity, weakness in pathological gaits
 - Management of pathological gaits.

Suggested Readings:

S. No.	Author	Title	Publisher	Year	Vol.
1	Norkin, C.C. and Levangie P.K.	Joint Structure and Function: Comprehensive Ara	Jaypee, New Delhi	1998	
2	Magee, David J.	Orthopedic and Physical Assessment	Saunders, Philadelphia	2002	
3	Donatelli, R.A.	Biomechanics of the Foot and Ankle	Davis, Philadelphia	1996	
4	Mow, Van C. and Hayes, W.C.	Basic Orthopedic Biomechanics	Lippincott, New York	1997	
5	Norkin, C.C. and White, J.	Measurement of Joint Motion	Jaypee, New Delhi	1995	
6	Kapandgi, I.A.	Physiology of Joints	Churchill-Livingstone	1998	3V
7	Tritschler, Katbleen	Practical Measurement and Assessment	Lippincott, New York	2000	
8	Leveau	Biomechanics of Human Motion			

PHYSIOTHERAPEUTIC IN NEUROLOGY

BPT YEAR-III

Course objectives:

1. To identify various neurological dysfunction clinically
2. To set goals and apply therapeutic skills in different neurological conditions.

Learning outcomes:

- Advanced clinical skills and techniques applicable to relevant physiotherapy areas, including assessment techniques, clinical reasoning and decision-making skills in developing treatment plans and comprehensive patient management.
- A capacity to undertake detailed searching, analysis and interpretation of computerised medical literature databases.
- An ability to promote evidence-based practice in physiotherapy

Course Contents: All sections carry equal weightage

Section – A

- a. Review of basic Neuro-Anatomy and Physiology
- b. Physiotherapy evaluation of a neurological patient, electro diagnostic procedures, interpretations and prognosis in different neurological conditions
- c. Spinal cord injury: review of anatomy and physiology
Physiotherapy Assessment of Spinal cord injury
Principles of Physiotherapy at various stages of Spinal cord injury
Rehabilitation goals and ADL training

Section – B

- e. Assessment and principles of therapeutic management of following neurological conditions:
Stroke, meningitis, encephalitis, Parkinson's disease, Cerebral palsy, Ataxia, Brain tumors
Motor neuron disease, Disseminated sclerosis, transverse myelitis, tumors, polio, syringomyelia, spina bifida,
Neuropathies, neuromuscular junction disorders and myopathies
- f. Developmental physiotherapy programs, reeducation and retraining techniques in neurological conditions, approaches like: Bobath's, Rood's, PNF, Vojta techniques, biofeedback, Brunnstorm, Motor Relearning programming

Section – C

- a. Peripheral nerve injuries, surgical resection & repair:
Classification & types
Functional assessment, investigation, diagnosis & prognosis
Physiotherapeutic management
- b. Traumatic brain injury:
Types and Mechanisms of head injury
Clinical features, potential complications
Physiotherapy principles of immediate and postoperative therapeutic management
- c. Neurosurgery: Post surgical Physical therapy in neurosurgical procedures – craniotomy, shunts, SOL resection, surgical treatment of spasticity, cervical cord decompression

Suggested Readings:

S. No.	Author	Title	Publisher	Year	Vol.
1	Hislop, H.J. and Montgomery, J.	Daniels and Worthingham's Muscle Testing: Techniques of Manual Examination	W.B.Saunders, Philadelphia	2002	
2	Bobath, Berta	Adult Hemiplegia: Evaluation and treatment	Butterworth, Oxford	1990	

3	Shepherd, R.B.	Physiotherapy in Paediatrics	Butterworth-Heinemann, Oxford	1995	
4	Downie, P.A.	Cash's Textbook of Neurology for Physiotherapy	Jaypee, New Deli	1993	
5	Swaner, K.A. and LaVigne, J.M.	Brunnstom's Movement Therapy in Hemi	Lippincott, New York	1992	
6	Burns, Y.R. and Macdonald J.	Physiotherapy and the Growing Child	Harcourt, Singapore	1998	
7	Bromley, Ida	Tetraplegia and Paraplegia	Churchill-Livingston, London	1998	
8	Voss, Dorothy	Proprioceptive Neuromuscular Facilitation	Lippincott, New York	1989	
9	Adler, S.S.	PNF in Practice	Springer, New York	2003	
10	Carr, J.H. and Shepherd, R.B.	Stroke Rehabilitation	Butterworth-Heinemann, Singapore	2003	
11	Carr, J.H. and Shepherd, R.B.	Neurological Rehabilitation	Butterworth, Oxford	1998	
12	Kottke, F.J. and Lehman J.F.	Handbook of Physical, Medicine and Rehabilitation	W B Saunders, London	1990	
13	Umphred, Dracy A	Neurological Rehabilitation	Mosby, London	2001	

PHYSIOTHERAPEUTIC IN ORTHOPAEDIC

Course/Paper: 03BTP106

BPT01 YEAR-III

Course Objectives:

1. To identify various Musculo skeletal dysfunction clinically
2. To set goals and apply therapeutic skills in different orthopaedic conditions.

Learning Outcomes:

- Describe the epidemiology of Musculoskeletal Disorders at all ages, and apply this when developing a differential diagnosis.
- Assess mechanism of injury when considering diagnosis.
- Distinguish inflammatory from non-inflammatory conditions.
- Assess the possibility that musculoskeletal symptoms can be due to psychological causes (somatisation).
- Describe when blood tests and imaging methods are required for diagnosis, how to interpret them and how they influence management

Course Contents: All sections carry equal weightage

Section – A

- a) Physiotherapy evaluation of an orthopaedic patient
- b) Manipulation therapy - general assessment, indications, contra indications, brief introduction to schools of manual therapy (Maitland, Kaltenborne, Cyriax, Mulligan, Mackenzie)
- c) Spinal stabilization, scoliosis correction
- d) Assessment, management and treatment goals of:
 - Osteoarthritis,
 - Spondylosis, spondylolisthesis
 - Proplapse intervertebral disc, Lumbar cord decompression
 - Adhesive capsulitis, rotator cuff lesions of shoulder
 - Tuberculosis of the spine, bone and major joints
 - Avascular bony necrosis at hip joint

Section – B

- d) Assessment, management and treatment goals of:
 - Rheumatoid arthritis
 - Ankylosing Spondylitis
 - Deformities: - Torticollis, thoracic outlet syndrome, CTEV, pes cavus, pes planus, Scoliosis, kyphosis, lordosis, coxa vara, genu valgum-varum-recurvatum
- e) General principles of physiotherapy in fracture management including complications at different stages
- f) General principles of physiotherapy in dislocations management including complications
- g) Post fracture - assessment and PT management of: various fractures of upper limb, lower limb, vertebral column

Section – C

- 1) Assessment and therapeutic management of: Soft tissue injuries – Sprains, strains, ligament and cartilage tear/rupture
- 2) Orthopaedic surgery: General principles of assessment, physiotherapy management in surgical conditions like – osteotomy, joint replacements, ORIF, arthodesis, Illizarov's technique
- 3) Tendon transfers, soft tissue releases & soft tissue repair
- 4) Surgeries in C.P. & Polio
- 5) Amputation – pre & postoperative evaluation & principles of management Pre & post prosthetic assessment & principles of management

Suggested Readings:

S. No.	Author	Title	Publisher	Year	Vol.
1	Smith, Laura K	Brunnstrom's Clinical Kinesiology	Jaypee, New Delhi	1996	
2	Buckley, John	Exercise on Prescription	Butterworth-Heinemann, Boston	1997	
3	Downie, Patricia A.	Cash's Textbook of Orthopedics and Rheumatology	Jaypee, New Delhi	1993	
4	Donatelli, R. A. and Wooden, M.J.	Orthopedic Physical Therapy	Churchill- Livingstone, New York	2001	
5	Tidswell, Marian	Orthopedic Physiotherapy	Mosby, London	2001	
6	Jones and Barker,	Human Movement Explained	Butter worth- Heine	2000	
7	Jacobs, Karen	Ergonomics For Therapist	Butter worth- Heine, Boston	1999	
8	Maitland, G.D.	Maitland's Vertebral Manipulation	Butter worth- Heine, Oxford	2001	
9	Nachemson, A.L. and Jonsson,, E.	Neck and Back pain: Scientific Evidence	Lippincott, New York	2000	
10	Donatelli, R.A.	Physical Therapy of Shoulder	Churchill, New York	1997	
11	Walker, J.M. and Helewa, A.	Physical Therapy in Arthritis	W B Saunders, London	1996	
12	Engstrom,B. and Van de Ven C.	Therapy for Amputees	Churchill, London	2001	
13	Calliet, Rene	Knee Pain and Disability	Jaypee, New Delhi	1992	
14	Calliet, Rene	Shoulder Pain	Jaypee, New Delhi	1992	
15	Calliet, Rene	Low Back pain syndrome	Jaypee, New Delhi	1992	
16	Calliet, Rene	Neck and arm pain	Jaypee, New Delhi	1991	
17	Calliet, Rene	Foot and Ankle Pain	Jaypee, New Delhi	1992	
18	Calliet, Rene	Soft tissue Pain and disability	Jaypee, New Delhi	1988	

PRACTICAL PT - CLINICALS

Course/Paper: 03BTP201

BPT01 YEAR-III

Course Objective: Approach to patient, collection of demographic data, art of history taking and bedside / OPD manners in relation to patient, general assessment of patient from therapeutic point of view, reaching to provisional diagnosis, and testing of therapeutic skill learned

The student will be posted in the department of Physiotherapy & he/she will learn the assessment, diagnosis, & physiotherapy treatment of patients visiting the department.

There will be no university examination. The students will be awarded marks on the basis of his/her attendance & performance during clinical postings in the department of Physiotherapy, etc.

PRACTICAL PHYSIOTHERAPEUTIC IN NEUROLOGY

Course/Paper: 03BTP202

BPT01 YEAR-III

Practical demonstration of basic principles of physiotherapy assessment, functional assessment and application of physical therapy in treatment of neurological conditions

Students will be assessed by viva & practical demonstration of application of Physical therapy based upon learning in theory.

PRACTICAL PHYSIOTHERAPEUTIC IN ORTHOPAEDIC

Course/Paper: 03BTP203

BPT01 YEAR-III

Practical demonstration of basic principles of application of physiotherapy assessment, functional assessment and application of physical therapy treatment of orthopaedic conditions

Students will be assessed by viva & practical demonstration of application of Physical therapy based upon learning in theory.

YEAR IV

COMMUNITY REHABILITATION & DISABILITY PREVENTION

Course/Paper: o4BTP101

BPT YEAR-IV

Course objectives:

- 4) To understand the concept of Rehabilitation and team approach.
- 5) Principles of Physiotherapy in Rehabilitation.
- 6) Disability evaluation & management.
- 7) Application of Physiotherapy at community level.

Course Contents: All sections carry equal weightage

REHABILITATION

Section – A

1. Introduction of Rehabilitation & History
2. Epidemiology of disability (Impairment, disability, phases of disability process, etc.).
3. Principles of Rehabilitation & concept of team approach with rolls of each individual participant.
4. Organization of Rehabilitation unit.
5. Disability prevention evaluation & principles of Rehabilitation Management.
6. Role of Physiotherapy in Rehabilitation (Preventive, treatment & restoration)

Section – B

1. Brief outline of Communication disorder & its implications on Rehabilitation process.
2. Brief outline of psychosocial & vocational aspects of Rehabilitation.
3. Introduction to Occupational therapy.
4. Activities of daily living, functional assessment & training for functional independence.
5. Brief outline of basic community medicine with special reference to community based Rehabilitation, infrastructure and role of CBR
6. Assessment of disability in rural & urban setups. Health care delivery system & preventive measures with specific reference to disabling conditions. Community education programme.
7. Application of Physiotherapy skills at community level with special reference to the need at rural level.

BIO-MEDICAL ENGINEERING

Section – C

1. Introduction to surgical anatomy and various pathological deviations with respect to brace fitting (brief outline only).
2. Rationale of prescribing Prosthetic and Orthotic devices.
3. Types of Prosthetic and Orthotic devices: Spinal, Lower limb, and Upper limb.
4. Checkout, usage advice, precautions, and follow-up.
5. Walking aids and wheel chairs: prescription, usage advice, and follow-up.

Suggested Readings:

S. No.	Author	Title	Publisher	Year	Vol.
1	Park, J.E.	Text Book of Preventive and Social Medicine	Banarsidas, Jabalpur	1987	
2	Pedretti, L.W.	Occupational Therapy: Practice skill	Harcourt-Brace, New York	1990	
3	Sunder, S.	Rehabilitation Medicine	Jaypee, New Delhi	1999	
4	Bates, Barbara	Physical Examination and History Taking	J.B.Lippincott, Philedelphia	1995	
5	Mackee, Pat	Orthotics in Rehabilitation	Jaypee, New Delhi	1998	
6	W.H.O.	Disability Prevention and rehabilitation In primary Health Care: Guide for District Health and Rehabilitation Managers	W.H.O	1995	
7	Lusardi, M.M. and Nielsen, C.C.	Orthotics and Prosthetics In Rehabilitation	Butter worth- Heine, Woburn	2000	
8	Delisa, Joel A.	Rehabilitaion Medicine: Principal and Practice	J.B.Lippincott, New York	1998	
9	Braddom, Randall L.	Physical Medicine and Rehabilitation	W B Saunders, New York	2000	
10	Sharwan Kumar	Multidisciplinary Approach to Rehabilitation	Butter worth- Heine, New York	2000	
11	W.H.O.	Community- Based Rehabilitation and The Health Care Referral Services: Guide for Programme managers	W.H.O.	1994	
12	Kottke, and Lehmann	Handbook of Physical Medicine and Rehabilitation	W B Saunders, London	1990	

RESEARCH METHODOLOGY & BIO-STATISTICS

Course/Paper: 04BTP102

BPT YEAR-IV

Course Contents: All sections carry equal weightage

Learning outcomes

- Select from, use and interpret results of, descriptive statistical methods effectively;
- Demonstrate an understanding of the central concepts of modern statistical theory and their probabilistic foundation;
- Select from, use, and interpret results of, the principal methods of statistical inference and design;
- Communicate the results of statistical analyses accurately and effectively

SECTION-A (BIOSTATISTICS)

1. Definition – Statistics, Biostatistics
2. Applications of Biostatistics
3. Data collection from experiments & surveys.
4. Variable – Qualitative & Quantitative, Discrete and continuous.
5. Presentation of Data: -
 1. Tabular Presentation of Data – Statistical Table, Format of a Table.
 2. Frequency Distribution – construction of Frequency Distribution, cumulative and relative frequency distribution, Exclusive and inclusive method of classification of Data.
3. Diagrammatic Presentation of Data: -
Bar Diagrams, Pie Diagram, Line Diagram, Pictogram, Cartogram or Statistical map.
4. Graphical representation of a Frequency distribution – Histogram, Frequency Polygon, Frequency curve, ogives or cumulative frequency curves.
6. Measures of central tendency or measures of Location – Mean, Median Mode in ungrouped & grouped series. Partition Values – Quartiles, Deciles, Percentiles in ungrouped & grouped series. Graphical Determination of Median, Mode & partition values.
7. Measures of Dispersion or Variation – Range, Mean Deviation, Standard Deviation.
8. Measures of Skewness – Pearson's and Bowley's coefficient of Skewness.
9. Probability – Random experiment, sample space, events, probability of an event, addition & multiplication laws of probability, use of permutations & combinations in calculation of probabilities, random variable, probability distribution of a random variable, Binomial Distribution.
10. Normal Distribution & Characteristics of Normal curve.

SECTION-B (BIOSTATISTICS)

- 1 Correlation – Bivariate distribution, scatter diagram, coefficient of correlation, calculation & interpretation of correlation coefficient.
 - 2 Regression – Lines of regression, calculation of Regression coefficient.
 - 3 Sampling – Methods of Sampling.
 - 4 Sampling Variability & significance – Sampling Distribution, Standard error, null hypothesis, alternative hypothesis, Type I & Type II errors, tests of significance, acceptance & rejection of null hypothesis, level of significance, Z test, t test (paired & unpaired), chi-square test.
 - 5 Estimation of confidence limits & intervals.
 - 6 Vital Statistics
 - Rates & ratios of vital events.
 - Measures of Mortality: - Crude Death Rate, Specific Death Rate, Age Specific Death Rate, Standardized Death Rates, Infant Mortality Rate.
 - Measures of Fertility: - Crude Birth Rate, General Fertility Rate, Specific Fertility Rate, Age Specific Fertility Rate, And Total Fertility Rate.
- A) Measurement of Population Growth: - Crude Rate of Natural Increase & Pearl's Vital Index, Gross Reproduction Rate, Net Reproduction Rate.
- B) Measures of Morbidity: - Morbidity Incidence Rate, Morbidity Prevalence Rate.
- C) Life Tables or Mortality Table.

SECTION-C (RESEARCH METHODOLOGY)

Objectives:

- b) To develop skills of critical thinking and selection of research strategy.
- c) To acquire skills to review literature, formulate problems, research writing and publishing. Clinical Research for physiotherapist:

Why? How? And When?

1. Research in physiotherapy:
 - Introduction
 - Research – types, concept, definition.
 - Selection of aim and objectives.
 - Principles of methodology, analysis and report writing.
2. Concepts of Measurements:
 - Direct and indirect measurement variables.

- Reliability and validity.
- Application of physiotherapeutic tests and measurements.
- 3. Research Design:
 - Principles of designing.
 - Methods – Descriptive, Exploratory, single subject, others.
 - Design models utilized in physiotherapy.
 - Design of model for fundamental and clinical research.
- 4. Interpretation of experimental findings:
 - Collection and interpretation data theory.
 - Data review.
 - Interpretation of fundamental and clinical research.

Suggested Readings:

S. No.	Author	Title	Publisher	Year	Vol.
1	Armstrong, H.B.	Critical Moments in Quantitative Research	Butter worth- Heine. , Oxford	2001	
2	Hollis, M. and Cook, P.F.	Practical Exercise Therapy	CBS, New Delhi	1999	
3	Gardiner, Dena	Principles of Exercise Therapy	CBS, New Delhi	1999	
4	Lippert, Lynn	Clinical Kinesiology for Physical Therapy	Jaypee New Delhi	1996	
5	Pagliarulo, M.A.	Introduction to Physical Therapy	Mosby, London	2001	
6	Jones,	Human Movement Explained	Butterworth Heine	2000	

PHYSIOTHERAPEUTIC IN GENERAL & CARDIOTHORACIC

Course/Paper: 04BTP103

BPT YEAR-IV

Course Contents: All sections carry equal weightage

SECTION-A (GENERAL)

- Principle of post surgical physical therapy management under following: 1 Chest physiotherapy
- 2 Abdominal wall care
- 3 Scar management
- 4 Pelvic Floor Care
- Dermatology: Physical therapy in:
 - Chronic Ulcers,
 - Leprosy (including Neuro-muscular complications)
 - Other dermatological conditions: Psoriasis, Vitiligo, acne, burns and skin grafting
- ENT: Physiotherapy management in- Maxillary Sinusitis, otitis media, rhinorrhoea
- Obs. & Gynaecology: Principles of physical therapy management in an Obs. Gynae patient: Incontinence, Prolapse Uterus, Pelvic Inflammatory disease, Muscular-skeletal and other problems associated with pregnancy & labour, caesarean section. Anti natal preparatory and post natal care

SECTION-B (CTVS)

- Review of basic cardio-thoracic anatomy and physiology
- Clinical examination including lung function tests in various pulmonary conditions
- Principles of physiotherapeutic treatment in following conditions:
 - Bronchitis, asthma & bronchiectasis
 - Pulmonary embolism, tuberculosis, emphysema, pleural effusion, atelectasis, pneumothorax, haemothorax, broncho-pulmonary fistula, empyema,
 - Pulmonary rehabilitation – aims & objectives, principles, techniques including biofeedback.

SECTION-C (CTVS)

- Clinical examination in cardiovascular conditions
- Principles of physiotherapeutic treatment in following conditions:
 - CHF, MI, PDA, HT
 - Endocarditis, valve anomalies, congenital heart disorders, thrombosis, phlebitis, thrombosis, Thrombo angitis obliterans, varicose veins, ulcers
 - Cardio-thoracic trauma/surgery:
 - Principles, techniques of physical therapy management in traumatic and other surgical conditions of chest, lung, pleura, heart and mediastinum
 - Principles of chest physiotherapy in ICU & ICCU.
- Physiotherapy care during bed-rest
- Physiotherapy in cancer and AIDS (General principles of management)

Suggested Readings:

S. No.	Author	Title	Publisher	Year	Vol.
1	Chemeron, M.H.	Physical Agents in Rehabilitation	W B Saunders, London	1999	
2	Polden, Margaret	Physiotherapy In Obstetrics and Gynecology	Jaypee, New Delhi	1990	
3	Downie, P.A.	Cash's Textbook Of Chest, Heart and Vascular Disorder's for Physiotherapists	Jaypee, New Delhi	1993	
4	Smith, H. and Ball, V.	Cardiovascular Respiratory Physiotherapy			
5	Frownfelter, D.	Principal and Practice of Cardiopulmonary Physiotherapy	Mosby, London	1996	
6	Irwin, S. and Tecklin, J.S.	Cardiopulmonary Physical Therapy	Mosby, Philedelphia	1995	
7	Froelicher, V.F. and Myers, J.N.	Exercise and the Heart	W.B.Saunders, London	2000	
8	Aua, Ruth S.	Women's Health: Text Book for Physiotherapy	Harcourt, Singapore	1998	
9	Michlovitz, S.L.	Thermal Agents in Rehabilitation	F A Davis, Philedelphia	1996	

PHYSIOTHERAPEUTIC IN SPORTS

Course/Paper: 04BTP104

BPT01 YEAR-IV

Course Objectives:

To acquire concepts of evaluation of sports and sports injuries

To learn concepts of sports training and physiotherapy for prevention and rehabilitation

Course Contents: All sections carry equal weightage

Section – A

- Pre-exercise evaluation
- Diet and nutrition
- Measurement of fitness components and sports skills
 - Measurement of muscular strength
 - Measurement of muscular endurance
 - Measurement of flexibility
 - Determination exercise endurance
- Physiological effects of exercise on body systems
 - Muscular system
 - Endocrine system
 - Cardio-respiratory system
 - Nervous system

Section – B

1. 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

Section – C

5. Sports injuries
 - i. Shoulder – instability, rotator cuff injury, biceps tendonitis and rupture, pectoralis major rupture, scapular dyskinesia and acromio-clavicular joint injuries
 - ii. Elbow – tennis elbow, golfer's elbow
 - iii. Wrist and hand – carpal tunnel syndrome, gamekeeper's thumb
6. Principles of injury prevention
7. Principles of training & Rehabilitation in sports injuries
8. Sports in Special age groups:
 - i. Female athletic triad
 - ii. Younger athlete- Musculo-skeletal problems, management, children with chronic illness and nutrition
 - iii. Older athlete- Physiological changes with aging, benefits, risks of exercise in elderly, exercise prescription guidelines for elderly

Suggested Readings:

S.No.	Author	Title	Publisher	Year	Vol.
1	Maheshwari, J	Essential Orthopedics			
2	Solomon, Louis	Apley's Systems of Orthopedics and Fracture	Arnold, London	2001	
3	Kolt, G.S and Mackler S.	Physical Therapies in Sports and Exercise	Livingston, London	2003	
4	Starkey, and Ryan,	Evaluation of Orthopedic and Athletic	F A Davis, Philedelphia	2002	

5	Mclatchie, and Lennox	Soft Tissues: Trauma and sports Injury	Butterworth Heine, Oxford	1993	
6	Norris, C.M.	Sports Injuries: Diagnosis and Management	Butterworth Heine, Oxford	2001	
7	Garrick, J.G.	Sports Injuries: Diagnosis and Management	W.B.Saunders, Philadelphia	1999	
8	Guten, Gray N.	Running Injuries	W.B.Saunders, London	1997	
9	James E.Z.	Athletic Injuries and Rehabilitation			
10	Fu, and Stone,	Sport Injuries	Lippincott, New York	2001	
11	Anderson, M.K.	Fundamentals of Sport Injuries and management	Lippincott, Philedelphia	2002	

PRACTICAL PT - CLINICALS

Course/Paper: 04BPT01201

BPT YEAR-IV

Assessment diagnosis, goal formulation, treatment plan formulation, and execution of therapeutic skills

The student will be posted in the department of Physiotherapy & he/she will learn the assessment, diagnosis, & physiotherapy treatment of patients visiting the department

There will be no university examination. The students will be awarded marks on the basis of his/her attendance & performance during clinical postings in the department of Physiotherapy, etc

PRACTICAL PHYSIOTHERAPEUTIC IN GENERAL & CARDIOTHORACIC

Course/Paper: 04BPT01202

BPT YEAR-IV

Practical demonstration of basic principles of application of physiotherapy assessment, functional assessment and application of physical therapy of general & cardio thoracic conditions

Students will be assessed by viva & practical demonstration of application of Physical therapy based upon learning in theory.

PRACTICAL PHYSIOTHERAPEUTIC IN SPORTS

Course/Paper: 04BPT01203

BPT YEAR-IV

Practical demonstration of basic principles of physiotherapy assessment, functional assessment and application of sports physiotherapy

Students will be assessed by viva based upon learning in theory

PROJECT WORK

Course/Paper: 04BPT01204

BPT YEAR-IV

The student will be doing specific case studies allotted by their teacher/guide. Subject is for Case Presentations and evaluations.

Minimum 5- 10 cases are to be documented for discussion.

There will be no university examination. Students will be assessed on the basis of Viva on his/her project work and the awards so secured by them will be sent to University.

INTERNSHIP GUIDELINES (AMENDED)

1. Candidates seeking entry to the internship period must have passed all examinations in all subjects (i.e. He/She must have secured total credits of the Programme).
2. Duration: 6 months inclusive of posting in rural setup/CBR/similar setup.
3. During the internship candidate shall have to work full time average 7 hours per day (each working day) for 6 Calendar months (total Credit hours - 1260).
4. Each candidate is allowed maximum of 6 holidays during entire Internship Programme and in case of any exigencies during which the candidate remains absent for a period more than 6 days, he/she will have to work for the extra days during which the candidate has remained absent.
5. Assessment: The interns/candidate shall maintain the record of work, which will be verified and certified by the Head of the Department under whom he/she works. Apart from scrutiny of the record of work, the Head of the Department shall undertake assessment and evaluation of training in attendance, discipline, knowledge, skills and attitude for the duration of training. The assessment report of the candidate shall be sent to the Parent institution.
6. Based on the record of work and date of evaluation the Director/Principal shall issue 'Certificate of Satisfactory Completion' of training following which the University shall award the Bachelor of Physiotherapy Degree or declare the candidate eligible for the same.
7. In the event of unsatisfactory report, the said intern shall have to repeat the internship for the period to be decided by the Head of the Institution concerned.
8. Intern will abide by all the rules & regulations of Institution/Hospital where they are posted.
9. Intern shall be responsible for proper use of equipments of the Institute/Hospital where they are posted. He/She shall be liable to pay for damages caused to the equipments resulting from improper use by him/her.
10. Internship duration can be extended by the Principal / Director on the grounds:
 - iv. Remaining absent in excess of the permitted 6 days leave period, which is due: An intern will compensate by working extra for each day leave taken.
 - v. Unsatisfactory performance during the period: If there are unsatisfactory reports in terms of performance of the intern, submitted by the Department In-charge, the said intern shall have to repeat the internship for a period at least two months further.
 - vi. Case of indiscipline at any level: A Discipline and Action Committee will be formed in the college / Institution convened by Internship coordinator/HOD PT & headed by Director/Principal. In case of any lack of discipline, breach of trust or indulgence in any criminal activity on the part of the interns when reported by the concerned departments of

Hospitals/Institutions where the interns have been posted, the defaulting Intern shall be called back immediately and subjected to disciplinary proceedings by the Disciplinary Action Committee.

vii. Punishments:

- b) Suspension of Internship for a period of 3-4 weeks for the reasons to be recorded. Following this disciplinary suspension, internship can be resumed only after submission of an appropriate undertaking/guarantee/surety. Period of suspension shall be considered as Break in Internship. Disciplinary Action Committee shall decide the period of suspension and resumption of Internship for a specified period.
- c) Rustication & Termination: In case of a serious complaint of indiscipline or breach of trust against intern or any criminal activity done by intern according to the law of the country, he/she may be rusticated along with termination of Internship.
- d) w.e.f. Academic Session 2006-07 Hon'ble Court of Law can resume the Internship in this case only on the abrogation of criminal charges against him.
- e) Institution shall have to satisfy themselves that satisfactory infrastructure facilities of Physiotherapy exist in the Institute / Hospital where the internship training has to be undertaken. Following parameters / guidelines have been suggested:
- f) It is mandatory for the Institution conducting BPT01 Programme to have its own Physiotherapy clinic fully furnished with all the necessary equipments as per the curriculum of the Programme.
- g) The Institutes & the Hospitals should have the Physiotherapy section with all the necessary infrastructure facilities.
- h) Senior Physiotherapist with sufficient clinical experience should manage the physiotherapy departments in the Institutes/Hospitals.

- i) Institute Director / principal can at his discretion grant NOC to the students to do the Internship at the place of his choice provided, the concerned Hospital fully satisfies the above criteria. For the purpose of granting NOC the candidate shall have to submit to the Institution the status of Physiotherapy Services available at the place where he intend to do his Internship.