

**DEPARTMENT OF PHYSIOTHERAPY  
GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR**

**PROPOSED SYLLABUS FOR  
BACHELOR OF PHYSIOTHERAPY  
FOUR & HALF YEARS DEGREE COURSE  
BASED ON CREDIT BASED SYSTEM  
REVISED SYLLABUS  
TO BE IMPLMENTED FROM: 2021-2022**

Note: -

- Weightage of minor and major tests etc. shall be conducted as per University Rules and Regulations.
- All other rules and regulations for the students of Physiotherapy shall be applicable as per ordinance of the Department / University already in force and / or as amended from time to time.

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## PREAMBLE

At the outset it must be mentioned that the present document should best be taken as a guiding framework. In preparing the same we are well aware that in some small pockets in the country, the teaching of Physiotherapy is thriving in creative directions. A few departments are grounded in clinical perspectives, some other in the experimental research and industrial-organizational areas. The Learning Outcome based curriculum framework (LOCF), it is to be better understood as a document to be studied in relation to other advances in the field of Physiotherapy. It intends to offer a broad guideline to reorient the organization of teaching-learning processes at the UG and PG level to augment the quality of learning in the context of contemporary challenges of higher education in India. It explores the opportunities to improve class room transaction, teacher preparation and sense of relevance for the learners. In this endeavour it departs from the earlier scheme in a major way and explicitly states the learning outcomes and uses that to organize the diverse teaching-learning processes. In so doing it tries to address the needs of society, groups and the individual.

This scheme considers learning as an experiential and participatory activity with sufficient space for innovation and initiative, building the scientific spirit of objectivity and critical perspective. In this venture teachers and learners are assumed to jointly engage in a creative exercise of knowledge construction and skill building. In the last few decades, the discipline of Physiotherapy has also emerged as a new treatment measure. Its training can empower students assess diagnose and treat various disorders or diseases and mal alignments. Teaching program therefore must include the agenda/ courses which are meaningful to the surrounding society. Educational institutions must reach out to the society. This will give us opportunity to get validation of skill training, knowledge acquisition, research and demonstration of relevance of graduate attributes. In turn, this kind of experience will also help shaping the learning outcomes. The employability gap would also be addressed. Preparing teachers to teach through pedagogies suitable to promote the values given in the LOCF document is an essential condition for the attainment of LOCF. It is perhaps the most daunting challenge in order to fulfil the mandate of LOCF. The diversity maintenance and appreciation, along with standardisation of teaching -learning across the nation requires accommodating local realities with an open mind.

Physiotherapy or Physical Therapy (P.T.) is a Movement Science with an established theoretical and scientific base and widespread clinical applications in the Prevention, Restoration and Rehabilitation, Maintenance and Promotion of optimal physical function.

Physiotherapists diagnose and manage movement dysfunction and enhance physical and functional abilities. This physical dysfunction may be the sequelae of involvement of any of the systems like Musculoskeletal, Neurological, Cardiovascular, Respiratory or other body systems. These practitioners contribute to society and the profession through practice, teaching, administration and the discovery and application of new knowledge about physiotherapy experiences of sufficient excellence and breadth by research to allow the acquisition and skills and behaviours as applied to the practice of physiotherapy. Learning experiences are provided under the guidance and supervision of competent faculty, in both, classroom as well as in clinic. The designed curriculum will prepare the entry-to-practice physiotherapist (PT) to be an autonomous, effective, safe and compassionate professional, who practices collaboratively in a variety of healthcare set ups such as neonatal to geriatric, from critical care to community fitness to sports training and is responsive to the current and future needs of the health care system.

This holistic approach incorporates a broad range of physical and physiological therapeutic interventions and aids. The core skills used by Physiotherapy include manual therapy, therapeutic exercises and the application of electro-therapeutic modalities.

Specifically, physiotherapists improve the client's quality of life by:

- Promoting optimal mobility, physical activity, and overall health and wellness;
- Preventing disease, injury, and disability;
- Geriatric care and Rehabilitation;
- Managing acute and chronic conditions, activity limitations and participation restrictions;
- Improving and maintaining optimal functional independence and physical performance;
- Rehabilitating injury and the effects of disease or disability with therapeutic exercise programs and other interventions; and
- Educating and planning maintenance and support programs to prevent re-occurrence, re-injury or functional decline.

## **LEARNING OBJECTIVES OF THE COURSE**

### **▪ COMMUNICATION**

- Effective communication and interpersonal skill which are adapted to meet the needs of diverse individuals and groups.

### **▪ ETHICAL AND LEGAL STANDARDS**

- Adherence to safe, ethical and legal standards of current practice (as identified by professional organisations, federal and state law and accrediting bodies).

### **▪ DIAGNOSIS AND PLAN OF CARE**

- Development of physiotherapy diagnoses and an individualized plan of care for the management and prevention of movement dysfunction across the life span.
- Demonstrate effective physiotherapy screening of the following systems for keep-refer decisions: Musculoskeletal; Neuromuscular; Cardiovascular and Pulmonary; Integumentary.
- Demonstrate effective history taking, examination, evaluation, and re-evaluation that leads to an appropriate physiotherapy diagnosis and prognosis for patients with disorder of the following systems: Musculoskeletal; Neuromuscular; Cardiovascular and Pulmonary; Integumentary
- Develop an appropriate plan of care and intervention for patients with disorders of the following systems: Musculoskeletal; Neuromuscular; Cardiovascular and Pulmonary; Integumentary.
- Assess and address needs of individuals and communities for health promotion and prevention of movement dysfunction.

### **1. TEAM MEMBER**

Effective participation as an intra- and inter-professional team member.

### **2. PRACTICE MANAGEMENT**

Effective clinical practice management for delivery of physiotherapy services in diverse settings.

### **3. TEACHING AND LEARNING PRINCIPLES**

Application of teaching and learning principles in educational, practice, and community settings.

#### **4. EVIDENCE-BASED PRACTICE**

Application of principles of critical thinking and clinical reasoning to evidence-based physiotherapist practice.

#### **5. PROFESSIONAL RESPONSIBILITY AND COMMITMENT**

Responsibility and commitment to the profession and society through life-long learning and involvement in activities beyond the job responsibilities.

## **LEARNING OUTCOMES OF THE COURSE**

On completion of this course, the students will be able to:

1. Integrate concepts from the biological, physical, behavioural, and clinical sciences into physical therapy services
2. Exhibit professional conduct and behaviours that are consistent with the legal and ethical practice of physical therapy
3. Demonstrate compassion, caring, integrity, and respect for differences, values, and preferences in all interactions with patients/clients, family members, health care providers, students, other consumers, and payers
4. Demonstrate culturally sensitive verbal, nonverbal, and written communications that are effective, accurate, and timely
5. Collect and critically evaluate data and published literature to apply in the delivery of care, practice management, and to examine the theoretical and scientific basis for physical therapy
6. Screen patients/clients to determine if they are candidates for physical therapy services or if a referral to, or consultation with, another health care professional or agency is warranted
7. Complete a patient/client examination/ re-examination and evaluate and interpret the examination data to determine a physical therapy diagnosis and prognosis
8. Employ critical thinking, self-reflection, and evidence-based practice to make clinical decisions about physical therapy services
9. Collaborate with patients/clients, caregivers, and other health care providers to develop and implement an evidence-based plan of care that coordinates human and financial resources
10. Provide services and information related to health promotion, fitness, wellness, health risks, and disease prevention within the scope of physical therapy practice.
11. Advocate for patient/client and profession
12. Provide consultative services and education to patients/clients, caregivers, health care workers, and the public using culturally sensitive methods that are adapted to the learning needs, content, and context
13. Employ effective leadership skills in the context of supervising, delegating, and mentoring within the profession

**BACHELOR OF PHYSIOTHERAPY**  
**PROGRAMME STUDY (CREDIT BASED SEMESTER SYSTEM)**  
 (Implemented from academic session 2020-21)  
**Bachelor of Physiotherapy: First Year**

<b>SEMESTER 1</b>										
<b>S. No</b>	<b>Course Code</b>	<b>Subject</b>	<b>Title</b>	<b>Teaching hrs./Week</b>		<b>Marks</b>				
				<b>L-T-P</b>	<b>Credits</b>	<b>Theory</b>		<b>Practical</b>		<b>Total Marks</b>
						<b>Internal</b>	<b>External</b>	<b>Internal</b>	<b>External</b>	
<b>1</b>	BPT 111 BPT 111P	Anatomy –I (Theory & Practical)	PC	5-0-4	7	30	70	30	70	200
<b>2</b>	BPT 112 BPT 112P	Physiology – I (Theory & Practical)	PC	5-0-4	7	30	70	30	70	200
<b>3</b>	BPT 113	Biochemistry (Theory)	PC	3-0-0	3	30	70	-----	-----	100
<b>4</b>	BPT 114 BPT 114P	Introduction to Electrotherapy (Theory & Practical)	PC	5-0-4	7	30	70	30	70	200
<b>5</b>	BPT 115	Sociology	PC	2-0-0	2	30	70	-----	-----	100
<b>6</b>	EVS-201-L	Environmental Sciences	PC	4-0-0	4	30	70	-----	-----	100
<b>Total Credits</b>					<b>30</b>	<b>180</b>	<b>420</b>	<b>90</b>	<b>210</b>	<b>900</b>

<b>SEMESTER II</b>										
<b>S. No.</b>	<b>Course Code</b>	<b>Subject</b>	<b>Title</b>	<b>Teaching hrs./Week</b>		<b>Marks</b>				
				<b>L-T-P</b>	<b>Credits</b>	<b>Theory</b>		<b>Practical</b>		<b>Total Marks</b>
						<b>Internal</b>	<b>External</b>	<b>Internal</b>	<b>External</b>	
<b>1</b>	BPT 121 BPT 121P	Anatomy –II (Theory & Practical)	PC	6-0-4	8	30	70	30	70	200
<b>2</b>	BPT 122 BPT 122P	Physiology – II (Theory & Practical)	PC	6-0-4	8	30	70	30	70	200
<b>3</b>	BPT 123	Pathology (Theory)	PC	3-0-0	3	30	70	-----	-----	100
<b>4</b>	BPT 124	Microbiology (Theory)	PC	3-0-0	3	30	70	-----	-----	100
<b>5</b>	BPT 125 BPT 125P	Introduction to Exercise Therapy (Theory & Practical)	PC	6-0-4	8	30	70	30	70	200
<b>Total Credits</b>					<b>30</b>	<b>150</b>	<b>350</b>	<b>90</b>	<b>210</b>	<b>800</b>

**Bachelor of Physiotherapy: Second Year**

<b>SEMESTER III</b>										
<b>S. No.</b>	<b>Course Code</b>	<b>Subject</b>	<b>Title</b>	<b>Teaching hrs./Week</b>		<b>Marks</b>				
				<b>L-T-P</b>	<b>Credits</b>	<b>Theory</b>		<b>Practical</b>		<b>Total Marks</b>
						<b>Internal</b>	<b>External</b>	<b>Internal</b>	<b>External</b>	
<b>1</b>	BPT 231 BPT 231P	Introduction to General Medicine (Theory & Practical)	PC	4-0-2	5	30	70	30	70	200
<b>2</b>	BPT 232 BPT 232P	Introduction to Orthopedics (Theory & Practical)	PC	4-0-2	5	30	70	30	70	200
<b>3</b>	BPT 233	Introduction to Pharmacology (Theory)	PC	4-0-0	4	30	70	----	----	100
<b>4</b>	BPT 234 BPT 234P	Basis of Exercise Therapy (Theory & Practical)	PC	6-0-4	8	30	70	30	70	200
<b>5</b>	BPT 235 BPT 235P	Basis of Electrotherapy (Theory & Practical)	PC	6-0-4	8	30	70	30	70	200
<b>6.</b>	BPT 236	Psychology (Theory)	PC	3-0-0	3	30	70	----	----	100
<b>Total Credits</b>					<b>33</b>	<b>180</b>	<b>420</b>	<b>120</b>	<b>280</b>	<b>1000</b>

SEMESTER IV										
S. No.	Course Code	Subject	Title	Teaching hrs./Week		Marks				
				L-T-P	Credits	Theory		Practical		Total Marks
						Internal	External	Internal	External	
1	BPT 241 BPT 241P	General Medicine (Theory & Practical)	PC	4-0-2	5	30	70	30	70	200
2	BPT 242 BPT 242P	Orthopedics (Theory & Practical)	PC	4-0-2	5	30	70	30	70	200
3	BPT 243	Advanced Pharmacology (Theory)	PC	4-0-0	4	30	70	----	----	100
4	BPT 244 BPT 244P	Advanced Exercise Therapy (Theory & Practical)	PC	6-0-4	8	30	70	30	70	200
5	BPT 245 BPT 245P	Advanced Electrotherapy (Theory & Practical)	PC	6-0-4	8	30	70	30	70	200
6.	BPT 246	Psychiatry (Theory)	PC	3-0-0	3	30	70	----	----	100
Total Credits					33	180	420	120	280	1000

### Bachelor of Physiotherapy: Third Year

<b>SEMESTER V</b>										
<b>S. No</b>	<b>Course Code</b>	<b>Subject</b>	<b>Title</b>	<b>Teaching hrs./Week</b>		<b>Marks</b>				
				<b>L-T-P</b>	<b>Credits</b>	<b>Theory</b>		<b>Practical</b>		<b>Total Marks</b>
						<b>Internal</b>	<b>External</b>	<b>Internal</b>	<b>External</b>	
<b>1</b>	BPT 351 BPT 351P	Neurology I (Theory & Practical)	PC	4-0-2	5	30	70	30	70	200
<b>2</b>	BPT 352	General Surgery including OBG (Theory)	PC	4-0-0	4	30	70	---	---	100
<b>3</b>	BPT 353	Biomechanics & Kinesiology I (Theory)	PC	4-0-0	4	30	70	-----	-----	100
<b>4</b>	BPT 354 BPT 354P	Physical Assessment & Manipulative Skills I (Theory & Practical)	PC	6-0-4	8	30	70	30	70	200
<b>5</b>	BPT 355 BPT 355P	Physiotherapy in Orthopedic Conditions I (Theory & Practical)	PC	6-0-4	8	30	70	30	70	200
<b>6.</b>	BPT 600	Clinical Training (Practical)	PC	0-0-4	2	---	----	100	----	100
<b>Total Credits</b>					31	150	350	190	210	900

**SEMESTER VI**

S. No	Course Code	Subject	Title	Teaching hrs./Week		Marks				Total Marks
				L-T-P	Credits	Theory		Practical		
						Internal	External	Internal	External	
1	BPT 361 BPT 361P	Neurology II (Theory & Practical)	PC	4-0-2	5	30	70	30	70	200
2	BPT 362	General Surgery including Eye & ENT (Theory)	PC	4-0-0	4	30	70	---	---	100
3	BPT 363	Biomechanics & Kinesiology II (Theory)	PC	4-0-0	4	30	70	----	----	100
4	BPT 364 BPT 364P	Physical Assessment & Manipulative Skills II (Theory & Practical)	PC	6-0-4	8	30	70	30	70	200
5	BPT 365 BPT 365P	Physiotherapy in Orthopedic Conditions II (Theory & Practical)	PC	6-0-4	8	30	70	30	70	200
6.	BPT 600	Clinical Training (Practical)	PC	0-0-4	2	---	----	100	----	100
Total Credits					31	150	350	190	210	900

**Bachelor of Physiotherapy: Fourth Year**

<b>SEMESTER VII</b>										
<b>S. No.</b>	<b>Course Code</b>	<b>Subject</b>	<b>Title</b>	<b>Teaching hrs./Week</b>		<b>Marks</b>				
				<b>L-T-P</b>	<b>Credits</b>	<b>Theory</b>		<b>Practical</b>		<b>Total Marks</b>
						<b>Internal</b>	<b>External</b>	<b>Internal</b>	<b>External</b>	
<b>1</b>	BPT 471 BPT 471P	Physiotherapy in Neurological Conditions-I (Theory & Practical)	PC	5-0-4	7	30	70	30	70	200
<b>2</b>	BPT 472 BPT 472P	Physiotherapy in Medical Conditions-I (Theory & Practical)	PC	5-0-4	7	30	70	30	70	200
<b>3</b>	BPT 473 BPT 473P	Physiotherapy in Surgical Conditions-I (Theory & Practical)	PC	5-0-4	7	30	70	30	70	200
<b>4</b>	BPT 474	Research Methodology	PC	3-0-0	3	30	70	----	----	100
<b>5</b>	BPT 475	Organization and Physiotherapy Ethics	PC	3-0-0	3	30	70	----	----	100
<b>6.</b>	BPT 476	Physiotherapy in Community Health	PC	3-0-0	3	30	70	----	----	100
<b>7.</b>	BPT 600	Clinical Training	PC	0-0-4	2	----	----	100	----	100
<b>Total Credits</b>					<b>32</b>	<b>180</b>	<b>420</b>	<b>190</b>	<b>210</b>	<b>1000</b>

**SEMESTER VIII**

S. No	Course Code	Subject	Title	Teaching hrs./Week		Marks					
				L-T-P	Credits	Theory		Practical		Total Marks	
						Internal	External	Internal	External		
1	BPT 481 BPT 481P	Physiotherapy in Neurological Conditions-II (Theory & Practical)	PC	5-0-4	7	30	70	30	70	200	
2	BPT 482 BPT 482P	Physiotherapy in Medical Conditions-II (Theory & Practical)	PC	5-0-4	7	30	70	30	70	200	
3	BPT 483 BPT 483P	Physiotherapy in Surgical Conditions-II (Theory & Practical)	PC	5-0-4	7	30	70	30	70	200	
4	BPT 484	Biostatistics	PC	3-0-0	3	30	70	----	----	100	
5	BPT 485	Rehabilitation Medicine including Orthotics & Prosthetics	PC	3-0-0	3	30	70	----	----	100	
6.	BPT 600	Clinical Training	PC	0-0-4	2	----	----	100	----	100	
7.	BPT 601	Project work	PC	0-0-4	2	----	----	-----	100	100	
Credits					Total	31	150	350	190	310	1000

**SIX MONTHS COMPULSORY INTERNSHIP**

<b>S. No.</b>	<b>Subject</b>	<b>Teaching hrs./Week</b>	
		<b>Hours</b>	<b>Credits</b>
<b>1.</b>	Rotatory Internship	Minimum 24 hrs. /Week (Total hrs. =500 hrs.)	Qualifying

## BACHELOR OF PHYSIOTHERAPY: FIRST YEAR

### SEMESTER I

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 111	Anatomy – I	PC	5 – 0 – 0	5

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks). Assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks.

#### **Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

#### **Course Outcomes**

S. No	At the end of the course, the student should be able to:
CO1	Understand the basic concept about structure and histology of human body parts
	Identify and describe anatomical aspects of muscle, bones & joints, & to understand and analyze movements of upper and lower extremity
CO2	To understand the anatomical basis of various clinical conditions e.g. trauma, deformities pertaining to lower limbs & pelvis
CO3	Understand the normal disposition, inter-relationships, gross, functional and applied anatomy of the musculoskeletal system.
CO4	Distinguish major arteries, veins and Lymphatic system with special emphasis on Upper Limb and Lower Limb.
CO5	Identify the microscopic structures of various tissues and organs in the human body and correlate the structure with the functions
CO6	Understand principles of embryology and genetics including genetic inheritance and stages involved in development of the organs and systems from the time of conceptions till birth.

#### **Course Contents**

##### **Unit-I**

1. General anatomy and general histology
  - a. Nomenclature
  - b. Tissues of body
  - c. Morphology of Skin, Muscle, Cartilage and Bone

d. Joints: Classification and general aspect

## Unit-II

1. General embryology and genetics.

## Unit-III

1. Upper limb: Osteology, Myology, Arthrology, Nerves & vessels and lymphatic drainage.

## Unit-IV

1. Lower limb: Osteology, Myology, Arthrology, Nerves & vessels and lymphatic drainage.

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 111 P	Anatomy Practical – I	PC	0 – 0 – 4	2

***Course Assessment Methods (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks). Assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks.***

### **Course Outcomes**

S.No	At the end of the course, the student should be able to:
CO1	Know about the histology and embryology of human body.
CO2	Demonstrate the movements of various joints of lower limb
CO3	Identify and locate all the structures of the body and to localize various surface landmarks.
CO4	Understand the principles of imaging techniques and interpretation of anatomical structures on plane radiographs of the body.
CO6	Understand principles of karyotyping and identify the gross congenital anomalies.

### **Course Contents**

1. General Histology
2. General Embryology
3. Upper Limb
4. Lower Limb

### **BOOKS RECOMMENDED:**

1. Chaurasia, Human Anatomy, Volume 1,2,3.7th edition. CBS Publishers.
2. Snells. Clinical Anatomy.9 th edition – Lippincott
3. Extremities by QuiningWasb.
4. L. Williams & Warwick, Gray's Anatomy –37<sup>th</sup> edition. Churchill Livingstone
5. Inderbir Singh, Textbook of Anatomy with Colour Atlas, Volume 1, 2, 3. 15thedition.CBSPublishers and Distributors
6. McMinn'slasts Anatomy –12<sup>th</sup> edition. Regional and Applied, Churchill Livingstone.
7. McMinn – A Colour Atlas of Human Anatomy, Mosby
8. Cunnigham Manual of Practical Anatomy Vol I, II, III.15<sup>th</sup> edition. Churchill Livingstone
9. A Textbook of Human Neuro Anatomy- 9th edition. Inderbir Singh, Jaypee Brothers

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 112	Physiology – I	PC	5 – 0 – 0	5

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks). Assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks.

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Outcomes**

S. No	At the end of the course, the student should be able to:
CO1	Understand the functional mechanisms of each organ system
CO2	Acquire the knowledge of the relative contribution of each organ system in maintenance of Homeostasis.
CO3	Be able to describe physiological functions of various systems, with special reference to Musculoskeletal, Cardio-respiratory, and alterations in function with aging.
CO4	Analyze physiological responses & adaptation to environmental stresses- with special emphasis on physical activity & temperature
CO5	Acquire the skill of basic clinical examination, with special emphasis to Cardiovascular and Respiratory system, & Exercise tolerance
CO6	Understand the principles related to maintenance of body equilibrium and composition.
CO7	Know about the integration physiology of different organ systems in health and diseases.

**Course Contents**

**Unit-I**

1. Functional System of the Cell:
  - a. Fluid, oedema, transport across cell membrane.
  - b. Homeostasis, internal environment and maintenance, control system of body.
  - c. Control of genetic function, cell differentiation, cancer.
2. Membrane and nerve muscle physiology:
  - a. Transport of substances through the cell membrane: diffusion, active transport.
  - b Membrane potentials and action potentials: Resting membrane potential of nerves, propagation of action potential, transmission of signals in nerve trunks.

- c. Contraction of skeletal muscle: molecular mechanism of muscle contraction, energetics of muscle contraction, characteristics Cell and its function, cell organelle and individual function, Intracellular fluid, extracellular of muscle contraction, neuromuscular junction, Excitation contraction coupling.
- d. Contraction and excitation of smooth muscle.
- e. Hormonal Control of smooth muscle contraction.

## **Unit-II**

- 1. Heart & Circulation.
  - a. Cardiac Muscle, Action potential, Cardiac cycle, heart sounds, murmur.
  - b. Valvular lesions, Rheumatic heart disease, cardiomyopathies & congenital disorders.
  - c. Cardiac output, coronary circulation, venous return & oxygen utilization.
  - d. Cardiac failure & shock, physiological basis of treatment.
  - e. Blood flow, microcirculation, lymphatic system, capillary circulation.
  - f. Angina pectoris myocardial infarction, physiological basis of treatment.
  - g. Blood pressure, regulation of heart pumping, hypertension, control & management.
  - h. Excitatory & conductive system of the heart, normal ECG & methods of recording.
  - i. Conduction defects & abnormal ECG.
  - j. Cardiac arrest & cardiac tamponade.

## **Unit-III**

- 1. Renal Physiology
  - a. Functional anatomy of kidney, renal blood supply, GFR and auto regulation.
  - b. Micturition, micturition reflex, abnormalities of micturition, ureter, urinary bladder, Vesicoureteral reflux.
  - c. Tubular processing of GRF.
  - d. Buffer, Acid-base balance, Renal function test.
  - e. ARF, Diuresis, diuretics.
  - f. CRF, dialysis, artificial kidney.

## **Unit-IV**

- 1. Blood, immunity.
  - a. RBC, WBC development & function: anemia, polycythemia, leukocytosis, leucopenia, leukemia.
  - b. Platelets: function, structure, abnormality, hemostasis.
  - c. Coagulation: coagulants, anticoagulants, tests & disorders.
  - d. Inflammation & immunity: immune cells, types of immunity, Immune disorders, autoimmunity, allergy, hypersensitivity vaccination, Immune reactions.
  - e. Blood groups, blood transfusion.
  - f. Erythroblastosis.

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 112 P	Physiology Practical – I	PC	0 – 0 – 4	2

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks). Assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks.

### **Course Outcomes**

S. No	At the end of the course, the student should be able to:
CO1	Acquire skill to use microscope for blood smearing, staining and blood cell counts of RBC and WBC.
CO2	Acquire the skill of basic clinical examination, with special emphasis to Cardiovascular and Respiratory system, & Exercise tolerance
CO3	Be able to describe physiological functions of various systems, with special reference to Musculoskeletal, Cardio-respiratory, and alterations in function with aging.
CO4	Analyze physiological responses & adaptation to environmental stresses- with special emphasis on physical activity & temperature

### **Course Contents**

1. Microscope, Blood smear, staining
2. Identification of blood cells and differential counts
3. R.B.C.
4. W.B.C.
5. Hemoglobin percentage and colour index.
6. E.S.R.
7. Bleeding time, clotting time
8. Grouping ABO Rh
9. General Examination of anemia, icterus, lymph node, oedema
10. Examination of CVS: CPR, Pulse rate, heart rate and measurement of blood pressure effects of change in posture and exercises, ECG (Normal)

### **BOOKS RECOMMENDED:**

1. Text book of Medical Physiology - Arthur Guyton. 11th edition. (Mosby)
2. Concise Medical Physiology- Chaudhari S.K. 6th edition, New Central Agency, Calcutta
3. Text Book of Practical Physiology – Ghai, 8th edition. Jaypee.
4. Text Book of Physiology – Anand and Manchanda, Tata MacGraw Hill.
5. Principles of Anatomy and Physiology – Tortora Grabowski. 14th edition. – Harper Collins.

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 113	Biochemistry	PC	3 – 0 – 0	3

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks). Assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks.

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Outcomes**

S No.	At the end of the course, the student should be able to:
CO1	Understand the structure, functions of cell, biochemical, nucleic acid and medical terminology.
CO2	Know the normal functions of different components of food. Basal metabolic rate and factors affecting BMR, with special reference to obesity
CO3	Understand the basic and clinical aspects of enzymology and regulation of enzymatic activity
CO4	Know the nutritional aspects of carbohydrates, lipids, proteins and vitamins

**Course Contents**

**Unit-I**

1. Basic biochemical aspects of mammalian cells-comparative differences in biochemical makeup of bacterial, plant and animal cells.
2. Structure and properties of Carbohydrates, Proteins and Lipids.
3. Nucleic acid - structure and metabolism.

**Unit-II**

1. Proteins -classification, basic knowledge of protein structure, biochemical properties of proteins, biochemical rate of proteins and amino acids.
2. Enzymes - definition, classification, general mechanism of enzyme action, isozymes and their role in functional disorders. Enzyme Inhibition.
3. Carbohydrate Metabolism - Glycolysis, Glucogenesis, Glycogen metabolism, Citric acid cycle. Role of carbohydrates in ATP production.

### **Unit-III**

1. Lipid Metabolism - Biosynthesis, Beta oxidation, Ketosis.
2. Protein Metabolism - Urea Cycle and its biomedical significances.
3. Functions of Vitamins and Minerals and their deficiency disorders.
4. Dietary balance, Regulation of feeding, Obesity and starvation.

### **Unit-IV**

1. Hormones -Biosynthesis of Thyroxin, Calcitonin, Parathyroid hormone, Supra renal cortical hormones, Growth Hormones, ACTH, MSH LPH, ADH, Oxytocin and Insulin
2. Common procedures used in biochemistry.

### **BOOKS RECOMMENDED:**

1. Lehninger Principles of Biochemistry – 7th edition. Freeman
2. Outlines of Biochemistry – 5th edition. Eric E.Conn.
3. Textbook of biochemistry: 9th edition revised A V S S Rama Rao

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 114	Introduction to Electrotherapy	PC	5 – 0 – 0	5

**Course Assessment Methods** (Internal: 30; External: 70) one minor test each of 20 marks, class performance measured through percentage of lecture attended (4 marks). Assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks.

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Outcomes**

S. No	At the end of the course, the student should be able to:
CO1	Understand the basic fundamentals of physics, electricity and electrotherapy.
CO2	Understand the physics, principles & Laws of Electricity & Electromagnetic spectrum
CO3	Know the common electrical components such as transistors, valves, capacitors, transformers etc.
CO4	Describe effects of environmental & man-made electro- magnetic field at the cellular level & risk factors on prolonged exposure.
CO5	Know the mains electrical supply, Electric shock & precautions, Basic electrical components & their functions
CO6	Identify various types of currents used in Physiotherapeutic practice.
CO7	Comprehend the fundamentals of electrotherapy and electro physical agents and thus interpret the various ways superficial thermal agents can be used to produce a therapeutic effect.
CO8	Understand the production of High Frequency, Medium Frequency & Low Frequency electrical currents.
CO9	Acquire knowledge of various superficial thermal agents and also acquire the skill of application.

**Course Contents**

**Unit-I**

1. Fundamentals of low frequency currents
  - a. Production of electricity, mains supply
  - b. A.C. currents and Faradic type current with their waveforms
  - c. D.C. Currents: Types, interrupted direct currents with their wave forms fundamentals of electrical charges, static electricity, physics of direct currents, Ohm’s law, conductors, capacitors, rheostat, potentiometers, ammeters,

oscilloscopes, types of electrodes, skin resistance, electrode gels types and its significance,

## **Unit-II**

1. Fundamentals of high frequency currents
  - a. Magnetism: E.M.F, conduction, Lenz's law
  - b. Transformer
  - c. Thermo ionic valves
  - d. Semi-conductors-types-transistors
  - e. Electronic circuits – oscillators, pulse generators, galvanometer, rectifier, capacitors etc.

## **Unit-III**

1. Electromagnetic Spectrum – laws of transmission, reflection, refraction, absorption, attenuation
2. Electromagnetic currents and fields, risk factors on prolonged exposure to electromagnetic field
3. Production, physical principles, panel diagram, testing of apparatus – SWD, ultrasound, UVR.

## **Unit-IV**

1. Production, physical principles, panel diagram, testing of apparatus – IFT, IRR. and LASER (no panel diagram)

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 114 P	Introduction to Electrotherapy Practical	PC	0 – 0 – 4	2

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks). Assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks.

### **Course Outcomes**

S.No	At the end of the course, the student should be able to:
CO1	Understand the basic fundamentals of physics, electricity and electrotherapy.
CO2	Demonstrate in brief about certain common electrical components such as transistors, valves, capacitors, transformers etc. The simple instruments used to test /calibrate these components [such as potentiometer, oscilloscope etc.] of the circuitry, and will be able to identify such components.
CO3	Know the common electrical components such as transistors, valves, capacitors, transformers etc.
CO4	Know the mains electrical supply, Electric shock & precautions, Basic electrical components & their functions

### **Course Contents**

1. Diode and triode valves, transistors, ammeter, voltmeter, rectifier, galvanometer, rheostat, resistance box, transformer and other electronic and electrical devices.
2. Demonstration of circuits in electrotherapy units like Stimulator, I.F.T., I.R.R., SWD, LASER and Ultrasound
3. Oscilloscope

### **BOOKS RECOMMENDED:**

1. Electrotherapy explained: principles and practice - Low & Reed, 4th edition. Butterworth Heinmann
2. Clayton's electrotherapy -12th Edition – Kitchen & Bazin – WB. Saunders
3. Therapeutic Heat and Cold-4th edition. Justus F. Lehmann – Williams & Wilkins.
4. Principles and Practice of Electrotherapy – 4th edition. Kahn – Churchill Livingstone
5. Electrotherapy: Clinics in Physical Therapy – Wolf – Churchill Livingstone
6. Clinical Electrotherapy – 3rd edition. Nelson & Currier
7. Electrotherapy in Rehabilitation– Meryl Roth Gerth – F A Davis
8. Thermal Agents in Rehabilitation –Susan L.Michlovitz–3rd edition.
9. Physical Principles Explained – Low & Reed – 4th edition. Butterworth Heinmann
10. Therapeutic Modalities in Sports Medicine-William E Prentice – Mosby
11. Rehabilitation Techniques-William E Prentice – Mosby

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 115	Sociology	PC	2 – 0 – 0	2

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks). Assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Outcomes**

S. No	At the end of the course, the student should be able to:
CO1	Understand the theory in society and community.
CO2	Know about family supporting, civilization and human nature.
CO3	Understand the sociological theories and concepts students can demonstrate the role of theory in Sociology.
CO4	Understand the reciprocal relationship between individuals and society
CO5	Understand the social and cultural processes and structures that inform social interact. Students can articulate an understanding of how culture and social structure operate.

**Course Contents**

**Unit-I**

1. Introduction - Definition of sociology, Sociology as a Science of society, uses of the study of Sociology. Application of knowledge of sociology in physiotherapy.
2. Sociology & health – Social psychological factors affecting the health status. Influence of social factors on personality, self-concept, self-esteem, self-efficacy, social consciousness and perception socialization in the rehabilitation of patients.
3. Socialization – definition – influence of social factors on personality, socialization in the hospital &rehabilitation of the patients.

## **Unit-II**

1. Family influence on human personality – individual health, Family & nutrition – effects of sickness on family – Psychosomatic diseases & Family.
  - a. Community – Role of rural & urban communities in public health, Role of community in determining beliefs, practices and home remedies in treatment.
  - b. Culture components impact on human, cultural meaning of sickness – response to sickness & choice of treatment [role of culture as social consciousness in molding the perception of reality] – Culture induced symptoms & diseases, sub culture of medical workers.

## **Unit-III**

1. Social change and control- meaning of social change and social control. Role of social change/norms, folkways, customs, morals, religion law and other means of social control in the regulation of human behavior. Role of social planning in the improvement of health and in rehabilitation.
2. Social cognition & attribution: Social cognition – nature and approaches, Prejudice and Discrimination, Attribution – nature and theories.

## **Unit-IV**

1. Social problems of the disabled: Consequences of the following social problems in relation to sickness disability: remedies to prevent these problems.
  - a. Population explosion.
  - b. Poverty & unemployment.
  - c. Beggary,
  - d. Juvenile delinquency
  - e. Prostitution.
  - f. Alcoholism
  - g. Problems of women in employment.
2. Social security & social legislation in relation to the disabled.
3. Role of a social worker.

## **BOOKS RECOMMENDED:**

1. An Introduction to Sociology - Sachdeva&Bhushan — Allahabad;KitabMahal Ltd.
2. Social problems in India – 3rd edition. Ram Ahuja.
3. Madan – India Social Problems, Vol-I- 7th edition. Allied publications
4. Macgee – Sociology –3rd edition.Drydon press.
5. Ahuja – Social Problems, 3rd edition. –Bookhire, Delhi.
6. Parter E’ Alder – Psychology and Sociology Applied to Medicine – 3rd edition. Saunders.

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
EVS-201-L	Environmental Studies (EVS)	PC	4 – 0 – 0	4

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks). Assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Outcomes**

This course enhances knowledge skills and attitude towards environment. And understand natural environment and its relationship with human activities. The students will be able to analyze human impacts on the environment.

**Course Outcomes**

S.No	At the end of the course, the student should be able to:
CO1	Students will be able to enhance and analyze human impacts on the environment
CO2	Integrate concepts and methods from multiple discipline and apply to environmental problems
CO3	Design and evaluate strategic terminologies and methods for sustainable management of environmental systems
CO4	Field studies would provide students first-hand knowledge on various local environment aspects which forms an irreplaceable tool in the entire learning process

**Course Contents**

**Unit I**

Multidisciplinary nature of environmental studies: Definition, scope and importance, need for public awareness; Concept, structure and function of an ecosystem: Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, Food webs and ecological pyramids; Introduction ,characteristics features, Structure and function of different ecosystems Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries; Biodiversity: Introduction- Definition: genetic, species and ecosystem diversity, Bio geographical classification of India, Ecosystem and biodiversity services; ecological,economic,social,consumptive use, productive

use, social ethical, aesthetic and option value. Biodiversity at global, national and local levels .India as a mega-diversity nation, Global Hot-spots of biodiversity, Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Biological invasions, Endangered and endemic species of India. Conservation of biodiversity: In-situ and ex- situ conservation of biodiversity

## **Unit II**

Renewable and non-renewable resources, Natural resources and associated problems. Forest resources: Use and over-exploitation, deforestation, case studies Timber extraction, mining, dams and their effects on forests and tribal peoples. Water resources: Use and over utilization of surface and ground water, floods, drought, conflicts over water, dam benefit and problems. Mineral resources: Use and exploitation environmental effects of extracting and mineral resources, Food resources: World food problem manage caused by agriculture and overgrazing, effects of modern agriculture fertilizers-pesticide problems, water logging, salinity, Energy resources: Growing energy need, renewable and non-renewable energy sources use of alternate energy sources, case studies. Land resources: Land as a resource and degradation, man induced landslides, soil corrosion and desertification.

## **Unit III**

Definition of Environment Pollution causes, effects and control measures of: Air pollution, Water pollution, Soil pollution, Noise Pollution, Nuclear hazards and human health risks; Solid waste management: Causes, effects and control measures of urban and industrial wastes. Pollution case studies; Disaster management: floods, earthquake, cyclone and landslides. Climate change, global warming, acid rain, ozone layer depletion, different laws related to environment: Environment Protection Act, Air (Prevention and control of Pollution) Act, Water (Prevention and control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act ;International agreements : Montreal and Kyoto protocol and natural reserves, Tribal populations and human health,

## **Unit IV**

Concept of sustainability and sustainable development, Water conservation, rain harvesting, and watershed management. Resettlement and rehabilitation of people: its problems and concerns, case studies Environment ethics: Role of Indian and other religion and cultures in environmental conservation, Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi), Human Population growth: Impact on environment, human health and welfare, Environment movements: Chipko movement, Silent valley movement, Bishnois of Rajasthan.

## **Field Work**

Visit to a local area to document environmental assets-river, forest/ grassland/ Hill/ Mountain; Study of simple ecosystems ponds, river, hill slopes, etc. Study of common plants, insects, birds; Visit to a local polluted site-Urban/Rural/Industrial/Agricultural.

## **BOOKS RECOMMENDED:**

1. ErachBharucha “Environmental studies for undergraduate’s courses”, University grants Commission and Bhartividya peeth institute of environmental education and research, Pune,

- University press pvt. Ltd. (India).
2. Fundamental concepts in environmental studies by Dr. DD. Mishra.S Chand publications.

**Reference books:**

1. Essentials of ecology and environmental sciences by Dr. SVS Rana. PHI Learning Pvt.ltd. Delhi
2. Environmental chemistry by Anil Kumar De, Wiley eastern limited.
3. Environmental science by T.G Miller, Wadsworth publishing Co, 13th edition
4. Ecology and environment by PD.Sharma, Rastogi publications.

## BACHELOR OF PHYSIOTHERAPY: FIRST YEAR

### SEMESTER II

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 121	Anatomy – II	PC	6 – 0 – 0	6

**Course Assessment Methods** (Internal: 30; External: 70) one minor test each of 20 marks, class performance measured through percentage of lecture attended (4 marks).

Assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Outcomes**

S. No	At the end of the course, the student should be able to:
CO1	Understand the basic concept about structure of human body parts.
	To identify and describe various parts of Central Nervous System (C.N.S) - Fore-brain, Midbrain, Hind-brain, Brain stem, courses of cranial nerves; functional components - course distribution- Anatomical bases of clinical lesions
	To describe the source and course of spinal tracts and to describe blood circulation of C.N.S. & spine
CO2	Identify and describe various components and contents of the Thorax- with special emphasis to tracheo-bronchial tree, & cardio- pulmonary system.
CO3	Identify and describe various components and contents of the Abdomen.
CO4	The basic structure and connections between the various parts of the central nervous system so as to analyze the integrative and regulative functions of the organs and systems.
C05	Distinguish major arteries, veins and Lymphatic system with special emphases on head, neck, face, thorax and CNS.
CO6	Understand the anatomical basis of various clinical conditions e.g. Trauma, deformities, pertaining to head, neck, face& CNS, thorax and abdomen

## Course Contents

### **Unit-I**

1. Head, neck and face with cranial nerves: Osteology, Myology, Arthrology, Nerves & Vessels and lymphatic drainage with embryology and histology.

### **Unit-II**

1. Brain and Spinal cord.

### **Unit-III**

1. Thorax: Osteology, Myology, Arthrology, Nerves & vessels and lymphatic drainage with embryology and histology.

### **Unit-IV**

1. Abdomen: Osteology, Myology, Arthrology, Nerves & vessels and lymphatic drainage with embryology and histology.

Course code	Subject	Title	Teaching Hours/ Week	
			L – T – P	Credits
BPT 121 P	Anatomy Practical – II	PC	0 – 0 – 4	2

***Course Assessment Methods (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks). Assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks.***

### **Course Objectives & Course Outcomes**

***This course provides the preparation of student towards his/her professional autonomy and understanding the basic concept about structure of human body parts and medical terminology***

### **Course Outcomes**

S. No	At the end of the course, the student should be able to:
CO1	Demonstrate the major parts of head, neck, thorax, abdomen and CNS.
CO2	Identify and practically describe various components and contents of the Thorax- with special emphasis to tracheo-bronchial tree, & cardio- pulmonary system.
CO3	Identify and describe various components and contents of the Abdomen and CNS.
CO4	Identify the microscopic structures of various tissues and organs in the human body and correlate the structure with the functions

## **Course Contents**

1. Head, Neck & Face
2. Brain & Spinal cord
3. Thorax
4. Abdomen

### **BOOKS RECOMMENDED:**

1. BD. Chaurasia, Human Anatomy, Volume 1,2,3. 7th edition. CBS Publishers and Distributors
2. Snells Clinical Anatomy. 9th edition – Lippincott
3. Extremities by Quining Wasb.
4. L. Williams & Warwick, Gray's Anatomy – 37<sup>th</sup> edition. Churchill Livingstone
5. Inderbir Singh, Textbook of Anatomy with colour atlas, Volume 1,2,3. 15<sup>th</sup> edition. CBS Publishers and Distributors
6. McMinn's Atlas of Anatomy – 12<sup>th</sup> edition. Regional and Applied, Churchill Livingstone
7. McMinn – A Colour Atlas of Human Anatomy, Mosby
8. Cunningham. Manual of Practical Anatomy Vol I, II, III. 15<sup>th</sup> edition. Churchill Livingstone
9. A Textbook of Human Neuro Anatomy- 9<sup>th</sup> edition. Inderbir Singh, Jaypee Brothers

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 122	Physiology – II	PC	6 – 0 – 0	6

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Outcomes**

S.No	At the end of the course, the student should be able to:
CO1	Understand the basic concept about function of human body parts.
CO2	Understand the functional mechanisms of each organ system
CO3	Understand the principles related to maintenance of body equilibrium and composition.
CO4	Know about the integration physiology of different organ systems in health and diseases.
CO5	Assess the influence of various environmental factors including personal stressors like exercise on the organ systems.

**Course Contents**

**Unit-I**

1. Respiration

- a. Mechanism of pulmonary ventilation, pulmonary volumes and capacities, Alveolar ventilation, functions of the respiratory passageways.
- b. Pulmonary circulation, shunt, pulmonary odema, pleural fluid.
- c. Physical principles of gas exchange transport of oxygen and carbon dioxide in the blood of body fluids.
- d. Regulation of respiration
- e. Respiratory dysfunctions.

2. Aviation, space and deep-sea during physiology:

Effects of low oxygen pressure on the body, mountain sickness, effects of accelerating forces, artificial climate, weightlessness in space, effects of high partial pressure of gases on the body, hyperbaric oxygen therapy.

## **Unit-II**

### 1. Nervous System:

- a. Sensory receptors, neural circuits for processing information
- b. Somatic sensations: touch, position, pain thermal, headache
- c. Special senses
- d. Motor functions of the spinal cord, cord reflexes, spinal cord transaction, spinal shock
- e. Cortical and brain stem control of motor function. The motor cortex, corticospinal tract, vestibular sensations and maintenance of equilibrium
- f. Cerebellum, basal ganglia, motor control. Integration of the many parts of the total motor control
- g. Intellectual functions of the brain, learning and memory
- h. Behavioral and motivational mechanisms of the brains. The limbic system, hypothalamus
- i. States of brain activity: sleep, brain, waves, epilepsy, psychoses
- j. Autonomic nervous system
- k. Cerebral blood flow, CSF and brain metabolism

## **Unit-III**

### 1. Gastrointestinal system

- a. Motility, nervous control, blood circulation
- b. Propulsion and mixing of food
- c. Secretory functions
- d. Digestion and absorption

### 2. Endocrinology and reproduction

- a. Hormone secretion, transport and clearance from blood.
- b. Hormones: Pituitary, thyroid, adrenocortical, insulin, parathyroid, and reproduction
- c. Puberty, menarche, menopause.
- d. Pregnancy and lactation
- e. Fetal and Neonatal physiology: Special functional problems of neonates, prematurity

## **Unit-IV**

### 1. Physiology of exercise & work

- a. Neuromuscular activity, human movement, physiological mechanism in movement, behavior, strength endurance and analysis of movement.
- b. Circulatory & respiratory response to exercise including effects on the heart, blood circulation, body fluid changes, pulmonary ventilation, gas exchange and transport, etc.
- c. Effect of exercise and work on other body functions.
- d. Metabolic and environmental aspects of exercise and work metabolism, energy requirement, efficiency of muscular work, nutritional aspects, heat and body temperature regulation and environmental factors.
- e. Effects of exercise training – endurance, fatigue and recovery
- f. Fitness and Health: age, sex, body, type, race, stress and medical aspects of exercise

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 122 P	Physiology Practical –II	PC	0 - 0 - 4	2

***Course Assessment Methods (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks). Assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 mark.***

### **Course Outcomes**

S.No	At the end of the course, the student should be able to:
CO1	Demonstrate the various tests for sensory and motor examinations.
CO2	Describe physiological functions of various systems, with special reference to cerebrum and cerebellum.
CO3	Examine gait, posture and other respiratory parameters,

### **Course Contents**

1. Physical fitness:
  - a. Breath holding
  - b. Mercury column Test
  - c. Cardiac efficiency test
2. Clinical examination: higher functions memory, orientations, reflexes (superficial and deep sensations)
3. Sensory and motor examinations
4. Test for function of cerebrum
5. Test for functions of cerebellum
6. Effect of load on muscle contraction and increasing strength of stimulation.
  - a. Effect of successive stimuli.
  - b. Phenomenon of fatigue.
  - c. Determination of rate of transmission of nerve impulses.
7. BMR Determination.
8. Gait, Posture.
9. Cerebellar function; cranial nerves
10. Examination of respiratory system: Artificial respiration, CPR Respiratory efficiency tests: Spirometry, lung volumes, timed volume capacity Respiratory rate and auscultation.

### **BOOKS RECOMMENDED:**

1. Text book of Medical Physiology -11th edition. Arthur Guyton (Mosby)
2. Concise Medical Physiology- 6<sup>th</sup>edition.Chaudhari, SK. New Central Agency.
3. Text Book of Practical Physiology –8th edition Ghai, Jaypee.
4. Text Book of Physiology – Anand and Manchanda, Tata MacGraw Hill.
5. Principles of Anatomy and Physiology -14th edition. Tortora Grabowski.

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 123	Pathology	PC	3 - 0 - 0	3

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Outcomes**

S No.	At the end of the semester, students will be able to:
CO1	Understand the basic concept about Pathology, pathological changes in various diseases of human body
CO2	Know the concepts of cell injury & changes produced thereby in different tissues & organs, capacity of the body in healing process
CO3	Understand etio -pathogenesis, the pathological effects & the clinical-pathological correlation of common infections & non-infectious diseases
CO4	Gained the knowledge of common immunological disorders & their resultant effects on the human body.
CO5	Correlate normal & altered morphology of different organ systems in different diseases needed for understanding disease process & their clinical significance
CO6	Understand in brief, about the Hematological diseases & investigations necessary to diagnose them & determine their prognosis

**Course Contents**

**Unit-I**

1. Introduction to pathology
  - a. Definition
  - b. Branches
  - c. Pathology as a science
  - d. Correlation between Pathology and Physiotherapy
2. Cell injury, death and adaptations
  - a. Definitions and Causes
  - b. Mechanisms
  - c. Morphology of Cell Injury

- d. Apoptosis
- e. Cellular adaptations to growth and injury
- 3. Acute and chronic inflammation
  - a. General features of inflammation
  - b. Vascular changes and cellular events-acute inflammation
  - c. Chemical mediators of inflammation
  - d. Definitions, Causes and histological features-chronic inflammation

## **Unit-II**

- 1. Tissue and cell repair
  - a. Normal Cell growth
  - b. Repair by connective tissue
  - c. Wound healing
  - d. Fracture healing
  - e. Pathological aspects of repair
- 2. Disorders of immune system
  - a. Cells of immune system
  - b. Immune mechanisms of tissue injury
  - c. Autoimmune disease; Mechanism, RA, SLE, Myasthenia gravis
  - d. Immunodeficiency diseases: Differences between primary and secondary AIDS
- 3. Environmental disorders
  - a. Injury by chemical agents
  - b. Injury by physical agents
- 4. Cancer

## **Unit-III**

- 1. Hemodynamic disorders  
Edema, Hyperemia and congestion, Hemorrhage, Haemostasis and Thrombosis, Embolism, Infarction Shock
- 2. Cardio vascular and peripheral vascular disorders
  - a. Anemia, heart and blood vessels, common congenital Anomalies, Rheumatic and coronary heart diseases
  - b. Venous diseases: Burger's disease, Varicose veins, Phlebothrombosis and thrombophlebitis.
- 3. Respiratory system  
Pneumonia, Tuberculosis, Bronchitis, Asthma, Pneumothorax, Hemothorax.

## **Unit-IV**

- 1. Urinary system  
Nephritis, Kidney stones.
- 2. Musculoskeletal system  
Osteoporosis, Osteomyelitis, Osteoarthritis, Rheumatoid Arthritis, Gout, Osteoma, Osteosarcoma, Chondroma, Chondrosarcoma, Osteochondrosarcoma, Muscular dystrophy.
- 3. Integumentary system  
Psoriasis, SLE, Acne Vulgaris
- 4. Nervous system  
Hydrocephalus Meningitis, Hematoma, Multiple Sclerosis, Alzheimer's disease, Parkinsonism, G.B. syndrome.

**BOOKS RECOMMENDED:**

1. Robbins Pathological Basis of Disease – 1st south asian edition. Cotran, Kumar and Robbins
2. Text Book of Pathology – 6th edition. Harsh Mohan – Jaypee Brothers.
3. Pathology: Implications for physical Therapists – 4th edition. Goodmann and Boissonnault – W.B. Saunders.
4. General Pathology – 6th edition. Walter and Israel – Churchill Livingstone.

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 124	Microbiology	PC	3 - 0 - 0	3

**Course Assessment Methods** (Internal: 30; External: 70) one minor test each of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Outcomes**

S No.	At the end of the semester, students will be able to:
CO1	Understand the basic concept about function of microbes, infection, virology immunology
CO2	Know the common human infections, pertaining to C.N.S., C.V.S., Musculo - skeletal, & Respiratory system

**Course Contents**

**Unit-I**

1. Immunology:
  - a. Infection, portals of entrance & mechanical barriers, Antigens, Antigen-Antibody reaction, Complement system, Structure and function of immune system, Immune response, Immune efficiency diseases, Hypersensitivity, Autoimmunity.
2. Immunity
  - a. Acquired immunity
    - i. Natural active & passive
    - ii. Artificial active and passive
  - b. Methods of active artificial immunity and passive artificial immunity.

**Unit-II**

1. Bacteriology:
  - a. Morphology, Nutritional Requirements, Metabolism, Growth, Classification and Identification of bacteria
  - b. Virulence, Toxins (Exo-toxins, endo-toxins)
  - c. Important bacterial diseases such as TB, Leprosy, bacterial meningitis, pneumonia, Bacterial encephalitis, mode of infection, spread and control.

**Unit-III**

1. Virology:
  - a. Morphology of virus

- b. Classification of virus
  - c. Virus host interaction
  - d. Important viral diseases such as polio, measles, mumps, rubella, viral meningitis and encephalitis and vaccines.
2. Disease transmission and Ward Sanitation
- a. Portal and exit of disease organisms from the body.
  - b. Transmission of disease.
  - c. Cross-infection, disinfectants and their practical applications.

#### **Unit-IV**

1. Miscellaneous:

- a. Medical mycology: Fungal infections in brief, Tineacapitis and Tineapedis, Aspergillosis, Otomycosis, Oculomycosis, Mycotic poisoning.
- b. Entamoebahistolytica.
- c. Culture media.
- d. Diagnostic microbiology.
- e. Prions

#### **BOOKS RECOMMENDED:**

1. Essentials of Medical Microbiology –4th edition. Bhatia & Icchpujani - Jaypee Brothers.
2. Medical Microbiology – 1st edition. ApurbaSanskarSastry, SandhyaBhat K. Jaypee brothers.
3. Microbiology – 5th edition. Luring M. Prescott
4. Microbiology – An introduction for the Health Sciences, Ackerman & Richards – W.B. Saunders Co.
5. Immunology: An introduction –9th edition. Ian R. Tizard
6. Textbook of Microbiology: 10th edition. Ananthanarayan and Paniker's

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 125	Introduction to Exercise Therapy	PC	6 - 0 - 0	6

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Outcomes**

S.No.	At the end of the semester, students will be able to:
CO1	Understand the basic fundamentals of physics, exercise, exercise therapy Know about the effect of gravity on human body.
CO2	Understand the various terms used in Mechanics, Biomechanics & Kinesiology,
CO3	Understands the basics of Movements – Classification, Principles, and Techniques & Uses
CO4	Know the use of different starting & derived positions
CO5	Acquire the skill of application of various exercises and techniques and describe types of Goniometer, merits and demerits of goniometry and to demonstrate and acquire the skill of measuring ROM with goniometer.
CO6	Describe the skill and usefulness of group and recreational activities-and will be able to demonstrate general fitness exercises used in Physical Training.

**Course Contents**

**Unit- I**

1. Mechanical Principle of movement

- a. Force and force systems, torque and angle of pull, pulleys and its types work, energy and power, friction, stress and strain, hook’s law, springs and their properties.
- b. Gravity: Effects of center of gravity, line of gravity and alteration, role in human body and movement.
- c. Equilibrium: Effects, supporting bases and factors affecting equilibrium.

2. Skeletal Basis of Movement

Planes and axis, joints and their classification, Degree of freedom, surface anatomy of joints.

### 3. Musculoskeletal Basis of Movement

Structure of muscles and its classification, muscle tension, muscle fiber, group action of muscles, Types of muscle contraction, Range of muscle work, Pattern and rhythm of movements, Muscular weakness and paralysis, Prevention of muscle wasting.

## Unit- II

### 1. Classification of Movements

Describe the types, techniques of application, indication, contraindications, precautions, effects and uses of following

- a. Active movements
- b. Passive movement: Relaxed, forced and Manipulative.
- c. Active assisted movement
- d. Resisted movement

2. Neuromuscular in-coordination: Review of normal neuromuscular coordination. Etiogenesis of neuromuscular in coordination and general therapeutic techniques, effects, indications, contraindications and precautions, Frenkel's exercises

## Unit- III

1. Simple Machines: Function and classification of levers and pulleys.

2. Relaxation: Describe Relaxation, Muscular fatigue, muscular spasm and tension (Mental and Physical), factors contributing to fatigue and tension, technique of relaxation (Local and General), Effects, uses and clinical application, Indications and contraindications.

3. Breathing Exercise: Relaxed diaphragmatic breathing exercise, Segmental breathing exercises

4. Physical activity: Importance of physical activity on health, Physical activity guidelines for Healthy children, adults and elderly people

## Unit- IV

### 1. Manual Muscle Testing (M.M.T)

- a. Principles and applications of techniques of Manual Muscle testing
- b. Testing positions, procedures and grading of muscles of upper limb, lower limb, trunk etc.

### 2. Goniometry

- a. Goniometer and its types.
- b. Principles, Techniques and application of goniometry.
- c. Testing, position, procedure and measurement of ROM of joints of upper limbs, Lower limbs and trunk

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 125 P	Introduction to Exercise Therapy Practical	PC	0 - 0 - 4	2

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks). Assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks.

### **Course Outcomes**

S.No.	At the end of the semester, students will be able to:
CO1	Demonstrate passive movements in terms of various Anatomical planes and various exercises.
CO2	Demonstrate and acquire the skill of measuring ROM with goniometer.
CO3	To demonstrate and also acquire the skill of relaxation
CO4	Demonstrate different starting & derived positions And use of pulleys

### **Course Contents**

1. Mechanical principles applied in Physiotherapy like force, torque, centre of gravity etc.
2. Demonstration of different types of levers in human body.
3. Practice measurement of ROM of joints, upper limb, lower limb and trunk by goniometer
4. Study different types of Muscle contractions, muscle work, group action of muscles and coordinated movement
5. Demonstration of basic techniques of application (manual or mechanical) of active exercises, passive movements, active assisted exercises and resisted exercises for upper limb and lower limb
6. Practice of region wise muscle strength grading: - upper limb, lower limb, trunk and neck.
7. Demonstration of different types of pulleys and springs used in physiotherapy.

### **BOOKS RECOMMENDED:**

1. Practical Exercise Therapy – Hollis – Blackwell Scientific Publications.
2. Therapeutic Exercises Foundations and Techniques – Kisner & Colby – F.A. Davis.
3. Principles of Exercise Therapy – Gardiner – C.B.S., Delhi.
4. Therapeutic Exercise – Sydney Litch
5. Muscle Stretching and Auto – Stretching Olaf Evjenth.
6. Werner Kuprian: Physical Therapy for Sports, W.B. Saunders.
7. Therapeutic Massage by A.G. Sinha, Jay Pee Publications, New Delhi.
8. Aquatic Exercise Therapy – Bates and Hanson – W.B. Saunders.
9. Hydrotherapy: Principles and Practices – Campion – Butterworth Heinmann.
10. Massage, Manipulation and Traction – Sydney Litch.
11. Biomechanics – Cynthia Norkin.
12. Therapeutic Exercise by Basmijjan and Wolf – Williams & Wilkins.
13. William E. Prentice, Rehabilitation Techniques – Mosby.

## BACHELOR OF PHYSIOTHERAPY: SECOND YEAR

### SEMESTER III

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 231	Introduction to General Medicine	PC	4 – 0 – 0	4

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks

#### **Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

#### **Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	Describe Etiology, Pathophysiology, Signs & Symptoms & Management of the various Endocrinal, Metabolic, Geriatric & Nutrition Deficiency conditions
CO2	Describe Etiology, Pathophysiology, Signs & Symptoms, Clinical Evaluation & Management of the various Rheumatological, Cardiovascular, Respiratory & Neurological Conditions
CO3	Acquire skill of clinical examination of Musculoskeletal, Pulmonary, Cardiovascular & Neurological System

#### **Course Contents**

##### **Unit-I**

1. Genetic, Immunological, Environmental, Climatic Factors in disease.
2. Bacterial Diseases: Tuberculosis, Pneumonia, Diphtheria, Tetanus, fever, Rheumatic fever, bacillary dysentery.
3. Viral diseases: Herpes-simplex and zoster, varicella, Measles, Mumps, Hepatitis- B, AIDS and Influenza.

## Unit-II

1. Metabolic & deficiency diseases: Diabetes, Hyperthyroidism, Hypothyroidism, Vitamin and Nutritional deficiency diseases.
2. Disease of alimentary tract: Disease of the teeth, Stomach, Duodenum, Small and Large intestine.
3. Disease of the Liver: Jaundice, Cirrhosis of the liver, Ascites, Hepatic failure, Liver transplantation.

## Unit-III

1. Disturbances in water, electrolyte and acid-base balance: Physiology of water and electrolytes, major manifestations of electrolyte and Acid base disorder, hypernatremia, hyponatremia, hyperkalemia, hypokalemia Sodium and water excess, calcium phosphate and magnesium disorders, metabolic Acidosis and alkalosis, respiratory acidosis and alkalosis.

## Unit-IV

1. Skin
  1. Signs and symptoms of skin disease.
  2. Skin damage from environmental hazards.
  3. Infections, infestations, insect bites and stings.
  4. Immunologically mediated skin disorders.
  5. Skin disorders in AIDS, immunodeficiency and venereal disease.
2. Brief description of eczematous dermatosis, psoriasis, lichen planus, Acne, rosacea, and similar disease, malignant disease of skin, disorders of keratinization, skin problems in infancy, old age, pregnancy and the skin, metabolic disorders and reticulohistocytic proliferative disorders, disorders of hair and nails, systemic disease, disorders of pigmentation, principles of management of skin diseases.

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 231 P	Introduction to General Medicine Practical	PC	0– 0 – 2	1

***Course Assessment Methods (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks***

### **Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	To do clinical examination of Musculoskeletal, Pulmonary, Cardiovascular & Neurological System
CO2	To interpret auscultation findings with special emphasis to pulmonary system, Chest X-ray, Blood gas analysis, P.F.T. findings, Blood studies done for Neurological & Rheumatological conditions
CO3	To describe the principles of Management at the Medical Intensive Care Unit.

## **Course Contents**

1. History taking, Normal pulse, BP
2. Identification and description of the instrument used for investigation and practice
3. Clinical discussion on differential diagnosis and management.
4. Biochemical Analysis – SGOT, SGPT, and Lipid profiles, Electrolyte Balance.

### **BOOKS RECOMMENDED:**

1. Davidson's principles and Practices of Medicine – 22nd edition. Churchill Livingston.
2. Hutchinson's Clinical Methods – 18th edition. Swash – Bailliere Tindall.
3. A short Textbook of Medicine – 3rd edition. Krishna Rao – Jaypee Brothers.
4. A short Textbook of Psychiatry – 20th edition. AhujaNiraj – Jaypee Brothers
5. Textbook of the Practice of Medicine –19th edition. Harrisons.
6. Essential Pediatrics –7th edition. OP. Ghai.
7. Symptoms and sign in Clinical Medicine – 12th edition. Chamberlin.
8. Pediatric Clinical Methods –3rd edition. Mehraban Singh
9. Clinical Examination – 4th edition. Epstein
10. Textbook of Medicine – 25th edition. Golwalla
11. A Short Text Book of Skin –6th edition. Prof. JS. Pasricha

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 232	Introduction to Orthopedics	PC	4- 0 - 0	4

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	Describe the Pathophysiology, clinical manifestations & conservative /Surgical management of various traumatic & old cases of the Musculoskeletal Conditions
CO2	Perform clinical examination & interpretation of the preoperative old cases & all the post- operative cases

**Course Contents**

**Unit-I**

1. Introduction to Orthopedics:
  - a. Introduction to orthopedic terminology. Types of pathology commonly dealt with, Clinical examination, common investigation X-rays and imaging techniques and outline Of non-operative management.
2. Principles of operative treatment:
  - a. List indications, contraindication and briefly outline principles of arthrodesis, Arthroplasty, Osteotomy, Bone grafting, Tendon – Transfers and Arthroscopy.

**Unit-II**

1. Sprains and muscle strains:
  - a. List common sites of sprains and muscle strains and describe the clinical Manifestations and treatment, tennis elbow, golfer’s elbow, Dequervain’s disease, Tenosynovitis, trigger finger, carpal tunnel syndrome and plantar fasciitis.
2. Sports injuries:
  - a. Injuries related to common sports their classification and management.

### Unit-III

1. Fractures and dislocations: General principles, outline the following:
  - a. Types of Fractures including patterns; open and closed fractures and fracture dislocations.
  - b. Difference between dislocations and subluxation.
  - c. General and local signs and symptoms of fractures and dislocation.
  - d. Principles of management of fracture and dislocations.
  - e. Prevention and treatment of complication including; Fracture Disease Volkmann's ischemic contracture, Sudeck's Atrophy, Carpal Tunnel Syndrome. Myositis ossificans and shoulder – hand syndrome
  - f. Fracture healing
2. Upper limb fractures and dislocations:
  - a. Enumerate major long bone fractures and joint injuries.
  - b. Briefly describe their clinical features, principles of management and complications.
3. Lower Limb Fractures and Dislocations:
  - a. Enumerate major long bone fractures and joint injuries.
  - b. Briefly describe their clinical features, principles of management and complication. Outline prevention and treatment of complications.
  - c. Principles of management & complications of Spinal Injuries.
  - d. Recurrent dislocation: outline the mechanism, Clinical Features, Principles of Management & complications of recurrent dislocation of the shoulders and Patella.

### Unit-IV

1. Diseases of Joints:

Outline the Clinical Features, Pathogenesis, Investigations, Differential Diagnosis and Management of Osteoarthritis, Rheumatoid arthritis, Ankylosing Spondylitis, Reiter's Diseases, Gout, pseudo – Gout, Psoriatic Arthritis, Hysterical Joint, etc.
2. Bone and Joint Infections:

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

Classify and outline the clinical features, management and complications of the following (benign/malignant bone and joint tumors, osteomas, osteosarcomas, osteoclastomas, Ewing's sarcoma, multiple myeloma).
4. Amputations;
  - a. Classify amputations list indication for surgery.
  - b. Outline pre-operative, operative and prosthetic management.

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 232 P	Introduction to Orthopedics Practical	PC	0– 0 – 2	1

***Course Assessment Methods (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks***

### **Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	Perform clinical examination & interpretation of various orthopedic conditions, the preoperative old cases & all the post- operative cases
CO2	To read & interpret a. Salient features of the X-ray of the spine & Extremities b. Pathological/ biochemical studies pertaining to Orthopedic conditions.

### **Course Contents**

1. Demonstration of treatment techniques and modalities
2. Joint injuries and fracture management
3. Assessment of an orthopedic patient for the above-mentioned conditions.
4. Knowledge of various orthopedic procedures.

### **BOOKS RECOMMENDED:**

1. Essential Orthopedics and applied physiotherapy –2nd edition. Jayant Joshi and PrakashKotwal.
2. Clinical Orthopedic Examination – 6th edition.Maggie – Churchill Livingstone.
3. Concise System of Orthopedics and Fractures – 2nd edition.Apley – Butterworth Heinmann.
4. Outline of Fractures – 12th edition.Adam – Churchill Living Stone.
5. Outline of Orthopedics – 14th edition.Adam Churchill Living Stone.
6. Physical examination in Orthopedics – 9th edition. Apley – Butterworth Heinmann.
7. Watson – Zones, Fractures and Joint Injuries – 7th edition.Wilson – Churchill Livingstone.
8. Orthopedics & Traumatology – 7th edition.Natrajan.
9. Essential Orthopedics – 4th edition.J. Maheshwari.
10. Orthopedics by Samuel, L. Turek Vol. 1 and 2.7<sup>th</sup> edition.
11. David J. Magee-5th edition. Orthopedics Physical assessment.
12. Evaluation of Ortho and Athletic Injuries- 3rd edition.Starkey

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 233	Introduction to Pharmacology	PC	4– 0 – 0	4

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	To describe Pharmacological effects of commonly used drugs by patients referred for Physiotherapy, list their adverse reaction, precautions to be taken and contra – indication, formulation and route of administration.
CO2	To identify whether the pharmacological effects of the drug interfere with Therapeutic response of Physiotherapy & vise a versa.
CO3	To indicate the use of analgesics & anti-inflammatory agents with the movement disorders with consideration of cost efficiency & safety for individuals need.
CO4	Aware of other essential & commonly used drug by patients –The basis for their use & common as well as serious adverse reaction.

**Course Contents**

**Unit-I**

1. General pharmacology
  - a. Introduction to pharmacology
  - b. Definitions and routes of drugs administration.

**Unit-II**

1. Pharmacokinetics:
  - a. Transportation across membranes, Absorption, Distribution
  - b. Biotransformation and drug excretion.

2. Pharmacodynamics:
  - a. Principles and mechanisms of drug action, combined effects of drugs, Factors Modifying drug action.

### **Unit-III**

1. Systemic pharmacology
2. Drugs acting on central nervous system
  - a. General anesthetics
  - b. Alcohol and disulfiram
  - c. Sedative and hypnotics
  - d. Anti-psychotic
  - e. Anti-depressant
  - f. Anti-Anxiety
  - g. Anti-epileptic drugs
  - h. Anti-parkinsonism drugs
  - i. Narcotic Analgesics
  - j. Analgesics, antipyretics and anti-inflammatory drugs
  - k. CNS stimulants.

### **Unit-IV**

1. Drugs acting on autonomic nervous system
  - a. Cholinergic agents (Parasympathomimetics)
  - b. Cholinergic blocking agents (Parasympatholytics)
  - c. Adrenergic agents (Sympathomimetics)
  - d. Adrenergic blocking agent (Sympatholytics)
  - e. Ganglion blocking and stimulating agents
  - f. Neuromuscular blocking agents
  - g. Local anaesthetic agents

### **BOOKS RECOMMENDED:**

1. Essential of Medical Pharmacology – 7th edition. Tripathi - Jaypee Brothers
2. Pharmacology – 9th edition. Gaddum
3. Medical Pharmacology – 3rd edition. Drill
4. Pharmacology Principle of Medical practice – 4th edition. Krantx& Carr
5. Pharmacological Basis of Therapeutics – 6th edition. Goodman, LS. Gilman A.

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 234	Basis of Exercise Therapy	PC	6– 0 – 0	6

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignment, quiz etc.(6 marks) and end semester examination is of maximum 70 marks

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	To define the various terms used in Mechanics, Biomechanics & Kinesiology, Recall the basic principles of Physics related to mechanics of movement/ motion
CO2	To acquire knowledge of Movements – Classification, Principles, and Techniques & Uses.
CO3	To acquire the skill of application of various massage manipulations & Describe Principles, Physiological effects, Therapeutic use, Merits & Demerits.
CO4	To describe the skill & significance of Group & Recreational Exercises & their Advantages & Disadvantages

**Course Contents**

**Unit-I**

Therapeutic exercises: Principles, classification, techniques, and physiological and therapeutic effects

1. Resistance Exercise:

- a. Goals and indications, precautions and contraindication of resistance exercise.
- b. Describe and differentiate isotonic, isometric and isokinetic resistance exercises
- c. Manual and mechanical resistance exercises
- d. Principles of application and techniques
- e. Specific regimens of resistance exercise

- f. Variables and various types of equipment used in resistance exercises
2. Stretching
    - a. Properties of contractile tissue
    - b. Flexibility, selective stretch, overstretch, type of contracture
    - c. Therapeutic methods to elongate soft tissue: Passive stretching, active inhibition, hold relax and self-stretching
    - d. Indicators, goals, procedures, precautions and contraindications
    - e. Relaxation and inhibition in preparation for stretching
    - f. Techniques of stretching

## **Unit-II**

1. Hydrotherapy:
  - a. Hydro-statistics and hydrodynamics
  - b. Physiological and therapeutic effects of hydrotherapy
  - c. Types of Hydrotherapy Equipment, indications contraindications, operation skills, patient preparations.
  - d. Whirlpool bath, hydroelectric bath, Steam bath, hot bath, contrast bath, Immersion bath, Aromatic bath, Sitz bath.
2. Traction:
  - a. Principles of traction
  - b. Physiological and therapeutic effects, classification and types
  - c. Indications, contraindications and precautions
  - d. Techniques of applications

## **Unit-III**

1. Functional re-education:
  - a. General therapeutic techniques to re-educate ADL function
  - b. Lying to sitting
  - c. Sitting activities and gait
  - d. Limb activity
2. Proprioceptive Neuromuscular Facilitation:
  - a. Basic procedures for facilitation
  - b. PNF techniques – characterization, goals, indications, contraindications, description and modifications
  - c. Patient Treatment: Evaluation, treatment goals, treatment regimes, assessment and treatment planning.
  - d. Pattern of facilitation
  - e. Application of PNF to scapula, pelvis, upper extremity and lower extremity

## **Unit-IV**

### Group therapy and therapeutic Gymnasium

1. Therapeutic Gymnasium: Set up of Gymnasium and its importance, various equipment in gymnasium, operational skills, effects and uses of each equipment, Parallel bars, Thera bands and Thera Balls.
2. Group Therapy: Types advantages and disadvantages

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 234 P	Basis of Exercise Therapy Practical	PC	0– 0 – 4	2

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 mark.

**Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	To describe & acquire the skill of use of various tools of the Therapeutic gymnasium
CO2	To acquire knowledge of different starting & derived positions
CO3	To acquire knowledge & skill of Relaxation
CO4	To demonstrate General Fitness exercises & understand principles of General Fitness

**Course Contents**

1. Structure and functions along with applications of various equipment's in gymnasium.
2. Strength and endurance training in normal individuals.
3. Stretching for major muscles and muscle group.
4. Use of various ambulation aids in gait training.
5. Structure and functions of hydrotherapy equipment and their applications
6. Evaluate ADLs and practice various training techniques.
7. Mat exercises
8. Plan and practice exercise programs for normal persons of various age groups.

**BOOKS RECOMMENDED:**

1. Therapeutic Exercises – 4th edition. Basmajin – Williams & Wilkins
2. Practical Exercise Therapy – 4th edition. Hollis – Blackwell Scientific Publications
3. Therapeutic Exercises Foundations and Techniques–7th edition. Kisner & Colby FA. Davis
4. Therapeutic Massage – 2<sup>nd</sup> edition. A.G. Sinha – Jaypee Publications, New Delhi
5. Aquatic Exercise Therapy – 1st edition. Bates and Hanson – W.B. Saunders
6. Hydrotherapy: principles and practices – Campion – 1st edition. Butterworth Heinmann
7. Principles of Exercise Therapy – 4th edition. Gardiner – C.B.S. Publishers, Delhi
8. Massage, Manipulation and Traction – Sydney Litch
9. Therapeutic Exercise – Sydney Litch
10. Biomechanics – 5th edition. Cynthia Norkin
11. Hydrotherapy – Duffield
12. Therapeutic Exercise – 5th edition. Basmajin and Wol
13. Muscle Stretching and AutoStretching - Olaf Evjenth
14. William E. Prentice – Rehabilitation Techniques – Mosby
15. Werner Kuprian: Physical Therapy for Sports – W.B. Saunders

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 235	Basis of Electrotherapy	PC	6– 0 – 0	6

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be
CO1	To describe the Physiological effects, Therapeutic uses, Merits/Demerits, Indications & Contraindications of various Low, Medium & High Frequency currents.
CO2	To describe the Physiological effects & therapeutic uses of various therapeutic ions & topical pharmaco-therapeutic agents to be used for the application of Iontophoresis & Phonophoresis

**Course Contents**

**Unit-I**

1. Biophysics of superficial heat and cold.
2. Physiological effects, therapeutic effects, uses, merits, demerits, indications, contra-indications, patient preparation, principles and techniques of treatment and application including precautions and dangers for:
  - a. Paraffin wax bath.
  - b. Whirlpool therapy.
  - c. Contrast bath.
  - d. Hydro collateral packs/cold packs
  - e. Cryotherapy.
  - f. Short wave diathermy pulsed SWD.
  - g. Micro wave diathermy pulsed MWD.
  - h. Infrared Therapy.

**Unit-II**

1. Low Frequency Currents:
  - A.C., D.C. and modified currents.

2. Production of D.C.
  - a. Physiological and therapeutic effects of constant currents.
  - b. Iontophoresis
  - c. Modified direct current – nervous pulses, duration and frequency, their effects on nerve and muscles.
  - d. Production of interrupted, surged currents and their effects.

### Unit-III

1. Transcutaneous Electrical Nerve Stimulator (TENS).
2. Pulse widths, frequencies and intensities used for various applications.
3. Principles of clinical application, effects and uses, indications, contra-indications, precautions and operational skills of equipment with patient preparation.
4. Theories of pain relief, pain gate theory.
5. High voltage pulsed galvanic stimulator.
6. Diadynamic currents DF, MF, LP, CP.
7. Micro currents electrical Stimulation – application and techniques.
8. Electro-acupuncture – Therapeutic effects and clinical application probe electrode and trigger point detection.

### Unit-IV

Medium frequency currents:

1. Interferential therapy (IFT): Introduction, amplitude modulation, current distribution, AMF, frequency modulation, rotating vector, electrode placement, indication and contra-indications, treatment guidelines.
2. Russian currents.
3. Rebox type currents.

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 235 P	Basis of Electrotherapy Practical	PC	0– 0 – 4	2

***Course Assessment Methods (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks***

### **Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	To acquire the skill of Application of the Electro therapy modes on models, for the purpose of Treatment
CO2	To acquire an ability to select the appropriate mode as per the tissue specific & area specific application

## **Course Content**

1. To study the following modalities and their methods of application:
2. Short wave diathermy unit.
3. Pulsed diathermy unit.
4. Microwave diathermy unit.
5. Pulsed microwave diathermy unit.
6. Infrared
7. Paraffin wax bath unit.
8. Hydro collator Pack Unit.
9. Basic operation of electric supply to the equipment and safety devices.
10. Various forms of therapeutic cold application region wise including ice, cold, packs, sprays.
11. TENS – its operation and application region wise.

## **BOOKS RECOMMENDED:**

1. Electrotherapy Explained: Principles and practice –4th edition. Low & Reed – Butterworth
2. Clayton's Electrotherapy –12th edition. Kitchen &Bazin – W.B. Saunders
3. Therapeutic Heat and Cold – 4th edition. Lehmann – Williams & Wilkins
4. Principles & Practice of Electrotherapy – 4th edition. Kahn – Churchill Livingstone
5. Electrotherapy: Clinics in Physical therapy – Wolf – Churchill Livingstone
6. Physical Principles Explained –4<sup>th</sup>edition. Low & Reed – Butterworth Heinmann
7. Clinical Electrotherapy – 3<sup>rd</sup> edition. Nelson & Currier
8. Electrotherapy in Rehabilitation – Meryl Roth Gerth. F.A. Davis
9. Michlovitz – 3<sup>rd</sup> edition. Thermal agents in Rehabilitation
10. Therapeutic Modalities in Sports Medicine – William E Prentice – Mosby
11. Rehabilitation Techniques – William E Prentice – Mosby

Course code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 236	Psychology	PC	3– 0 – 0	3

**Course Assessment Methods** (Internal: 30; External: 70) one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignment, quiz etc. (6 marks) and end semester examination is of maximum 70 marks

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four units). It will contain seven short answer type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.No.1 carry 14 marks.

**Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	Able to define the term Psychology & its importance in the Health delivery system, will gain knowledge of Psychological maturation during human development, growth, & alterations during aging process
CO2	Able to understand the importance of psychological status of the person in health & disease, environmental & emotional influence on the mind & personality
CO3	To acquire the knowledge as to how to deal with the patient

**Course Contents**

**Unit- I**

General psychology:

1. Psychology – Definition, fields and sub-fields, nature of psychology
2. Developmental psychology’s and its theories [in Brief] physio-psychological changes during infancy, early and middle childhood, adolescent stage, puberty, adulthood and old age.
3. Schools of thought – Psycho-analytical theory, behaviorism, structuralism and functionalism
4. Learning: Role of learning in human life, conditioned learning, Learning by Insight

## Unit- II

1. Emotions – its nature, sentiments and feelings, Emotional hygiene, Theory of emotion - Cannon bard theory of emotion, James Lange theory.
2. Conflict and frustration – Common defensive mechanisms, identifications, common reactions to frustrations, Regression, Repression, Projection, Sublimation & rationalization.
3. Intelligence – Definition, intelligence tests their uses, how the test is standardized intelligence quotient (I.Q.) General intelligence and special intelligence.
4. Abnormal psychology (In brief): Introduction, difference between normal and abnormal psychology, causes, anxiety disorders – phobias, obsessive – compulsive.

## Unit- III

Health psychology:

- a. Psychological reactions of a patient during admission and treatment (in brief)
- b. Stages of acceptance as proposed by Kubler-Ross
- c. Stress – physiological and psychological relation to health and sickness, psychosomatic disorders and stress management
- d. Communication – Types, verbal, non-verbal, developing effective communication, specific communication techniques
- e. Counseling – definition, aims and principles in counseling

## Unit- IV

1. Emotional and psychological needs of different patients
2. Geriatric and pediatric psychology in relation to their psychological needs (in brief)
3. Behaviour modifications: application of various conditioning and learning principles to modify patient behaviours
4. Personality – Definition, Type approach & Trait approach: Measurement of personality Interview, Questionnaire Rating, performance, Projective method, Factors contributing towards development of personalities.

## BOOKS RECOMMENDED

1. Morgan C.T. & King R.A. – Introduction to Psychology – 7<sup>th</sup> edition -Tata McGraw – Hill Publication
2. Munn N.L. – Introduction to Psychology – 5<sup>th</sup> edition. Premium Oxford, I.B.P. Publishing.
3. Foundation of Psychology - Weld Publishing House, Mumbai.
4. Applied to Medicine - Porter & Alder – W.B. Sanders
5. Behavioral Sciences for Medical under graduates – 2<sup>nd</sup> edition. Manju Mehta – Jaypee Bros.
6. Elementary psychology – 7<sup>th</sup> edition. Mohsin – MotiLalBanarsiDass, Delhi.
7. Critical Health Psychology – Edited by Michael Murray.
8. Integrative Psychotherapy in Health Care. A Humanistic Approach Basic Texts in Counseling and Psychotherapy - Series Editor – Stephen Frosh
9. Health Behavior and Health Education – 3<sup>rd</sup> edition. Edited By – Karen Glanz, Barbara K. Rimer, Frances Marcues Lewis
10. Trends in Life style and Health -11<sup>th</sup> edition. Laura V. Kinger

**BACHELOR OF PHYSIOTHERAPY: SECOND YEAR**  
**SEMESTER IV**

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T – P	Credits
<b>BPT 241</b>	<b>General Medicine</b>	<b>PC</b>	<b>4 - 0 - 0</b>	<b>4</b>

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.*

**Instructions for Paper Setters**

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.*

**Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
<b>CO1</b>	To describe Etiology, Pathophysiology, Signs & Symptoms & Management of the various Endocrinal, Metabolic, Cardiac and Pulmonary conditions.
<b>CO2</b>	To describe Etiology, Pathophysiology, Signs & Symptoms, Clinical Evaluation & Management of the various Cardiovascular and Respiratory conditions.

**Course Contents**

**Unit-I**

1. Diseases of Kidney and Genito-urinary system: Acute glomerulo-nephritis syndrome, nephritic syndrome, recurrent hematuria, Renal failure, infections of the kidney and urinary tract, obstruction of the urinary Tract, urinary tract calculi

**Unit –II**

1. Diseases of the Blood: Disorder of the erythrocytes and leucocytes, Blood transfusion, haemostasias, Disorders of the arteries and veins
2. Oncology: Clinical presentation and principles of management.
3. Acute Poisoning; Assessment of severity, general principles, general features of management and Prevention

### Unit –III

1. Disorder of heart rate, rhythm, and conduction.
2. Ischemic (Coronary) heart disease and Myocardial infarction.
3. Vascular disease.
4. Diseases of the heart valves.
5. Congenital Heart Disease.
6. Diseases of the myocardium.
7. Diseases of the pericardium.

### Unit -IV

1. Obstructive pulmonary disease.
2. Infections
3. Tumors of the Bronchus and lungs.
4. Interstitial pulmonary diseases.
5. Diseases of the naso-pharynx, larynx, trachea.
6. Diseases of the pleura, diaphragm, chest wall.

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 241 P	General Medicine (Practical)	PC	0- 0- 2	1

#### Course Assessment Methods (Internal: 30; External: 70)

one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

#### Course Objectives & Course Outcomes

S.No.	At the end of the semester, the students will be able to:
CO1	To interpret auscultation findings with special emphasis to pulmonary system, Chest X-ray, Blood gas analysis, P.F.T. findings, Blood studies done for Cardiovascular & Respiratory conditions
CO2	To describe the principles of Management at the Medical Intensive Care Unit.

#### Course Contents

1. Skill to palpate all pulses, rhythm, volume and heart rate/pulse rate discrepancy
2. Skill to assess B.P. at various sites, and its physiological variation and to assess Ankle Brachial index
3. Skills of exercise testing:
  - a. 6/12 min walk
  - b. Symptom limited

#### 4. Interpretation of

- a. Tread mill and ergo-cycle test findings
- b. ECG: IHD. & Blocks
- c. Chest X-Ray
- d. PFT: Obstructive/restrictive/reversibility

#### **BOOKS RECOMMENDED:**

- a. Davidson's principles and Practices of Medicine – 22<sup>nd</sup> edition. Edward – Churchill Livingstone.
- b. Hutchinson's Clinical Methods –18<sup>th</sup> edition. Swash – Bailliere Tindall.
- c. A short Textbook of Medicine – 3<sup>rd</sup> edition. Krishna Rao – Jaypee Brothers.
- d. A short Textbook of Psychiatry –20<sup>th</sup> edition. Ahuja Niraj – Jaypee Brothers.
- e. Textbook of the Practice of Medicine –19<sup>th</sup> edition. Harrison's
- f. Essential Pediatrics – 7<sup>th</sup> edition.12<sup>th</sup> edition.OP Ghai
- g. Symptoms and sign in Clinical Medicine – Chamberlin
- h. Pediatric Clinical Methods – 3<sup>rd</sup> edition. Mehrban Singh
- i. Clinical Examination – 4<sup>th</sup> edition. Epstein
- j. Textbook of Medicine – 25<sup>th</sup> edition. Golwalla
- k. A short Test Book of Skin – 6<sup>th</sup> edition.Prof. J.S. Pasricha

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T – P	Credits
BPT 242	Orthopedics	PC	4 - 0 – 0	4

**Course Assessment Methods (Internal: 30; External: 70)**

*one minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.*

**Instructions for Paper Setters**

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.*

**Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	Able to discuss the Pathophysiology, clinical manifestations & conservative /Surgical management of various traumatic & old cases of the Musculoskeletal Conditions

**Course Contents**

**Unit -I**

1. Regional Orthopedics: Outline the Definition, Classification, Clinical Features, Pathogenesis, Investigations, Differential Diagnosis, Complications and Management of the following conditions:

1. Shoulder: Tendinitis, Periarthritis, Rotator Cuff Injury, Deltoid Fibrosis, Adhesive Capsulitis, Frozen Shoulder etc.
2. Elbow: Tennis Elbow: Golfer’s Elbow, Recurrent Slipping of Ulnar Nerve, Pulled Elbow, etc.
3. Wrist and Hand: Ganglion, DeQuervain’s Disease, Trigger Thumb and finger, Carpal Tunnel Syndrome, Dupuytren’s Contracture etc.

**Unit – II**

1. Regional Orthopedics: Outline the Definition, Classification, Clinical Features, Pathogenesis, Investigations, Differential Diagnosis, Complications and Management of the following conditions:

a.) Spine

i. Cervical: Brachial Neuralgia, Brachial Plexus injury, Thoracic Inlet Syndromes, Torticollis, Cervical Spondylitis, and PIVD etc.

- ii. Thoracic and lumbar spine: Deformities of the spine, Spondylolisthesis, Lumbosacral Strain, Lumbar Canal Stenosis, Spondylitis etc.
- b) Hip: Coxa Vara, Slipped Upper Femoral Epiphysis, AVN etc.
- c) Knee: Osgood Schlatter's disease, Loose bodies, anterior knee pain, Chondromalacia Patellae, etc.
- d) Foot and Ankle Painful Heel, Plantar Fasciitis, Posterior Heel Pain, Deformities, Fore Foot pain, Metatarsalgia, Tarsal Tunnel Syndrome

**Unit – III**

1. Describe the Pathology, Microbiology, Prevention, Management and complication of Polio. Outline the treatment of residual paralysis including use of orthosis, Principles of muscle transfers and corrective surgery
2. Congenital Deformities: Outline the clinical features and management of CTEV. CDH, Flat Foot, Vertical Talus, limb deficiency (radial club hand and femoral, tibial and fibula deficiencies meningocele, Arthrogyposis multiplex congenita and Osteogenesis imperfecta

**Unit – IV**

1. Peripheral Nerve Injuries: Outline the clinical features and management, including reconstructive surgery of:
  - a. Brachial plexus injuries including Erbs, Klumpke's and crutch palsy, Radial, median and ulnar nerve lesions.
  - b. Sciatica and lateral popliteal lesions.
2. Hand injuries: outline of clinical management and complications of Skin and soft tissue injury, tendon injury, bone and joint injury.
3. Leprosy: Outline of clinical features, management and complications of neuritis, muscle paralysis, tropic ulceration, and hand and feet deformities.

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T – P	Credits
BPT 242 P	Orthopedics Practical	PC	0- 0- 2	1

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.*

**Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	To do clinical examination & interpretation of the preoperative old cases & all the post-operative cases
CO2	To read & interpret <ol style="list-style-type: none"> <li>a. Salient features of the X-ray of the spine &amp; Extremities</li> <li>b. Pathological/ biochemical studies pertaining to Orthopedic condition.</li> </ol>

## **Course Contents**

1. Assessment of an orthopedic patient for the above-mentioned conditions.
2. Knowledge of various orthopedic procedures
3. Demonstration of various treatment techniques and modalities

### **BOOKS RECOMMENDED:**

1. Essential of Orthopaedics and applied physiotherapy – 2<sup>nd</sup> edition. Jayant Joshi & Prakash Kotwal.
2. Clinical Orthopaedic Examination – 6<sup>th</sup> edition. Ronald McRae – Churchill Livingstone.
3. Concise System of Orthopaedics and Fractures – Apley – Butterworth Heinmann.
4. Outline of Fractures – 12<sup>th</sup> edition. Adam – Churchill Living Stone.
5. Outline of Orthopaedics – 14<sup>th</sup> edition. Adam – Churchill Living Stone.
6. Physical examination in Orthopaedics – 9<sup>th</sup> edition. Apley – Butterworth Heinmann.
7. Watson – Zones, Fractures and Joint Injuries – 7<sup>th</sup> edition. Wilson – Churchill Livinstone.
8. Orthopaedics & Traumatology – 7<sup>th</sup> edition. Natrajan
9. Essential Orthopaedics – 4<sup>th</sup> edition. J. Maheshwari
10. Orthopaedics by Samuel, L. Turek Vol. 1 and 2. 7<sup>th</sup> edition.
11. Orthopaedics Physical assessment-3<sup>rd</sup> edition. David J. Magee
12. Evaluation of Orthopaedic and Athletic Injuries- 3<sup>rd</sup> edition. Starkey.

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T – P	Credits
BPT 243	Advanced Pharmacology	PC	4- 0- 0	4

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test each of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.*

**Instructions for Paper Setters**

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Q.no.1 shall carry equal marks. Each question carries 14 marks.*

**Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	To describe Pharmacology effects of commonly used drugs by patients referred for Physiotherapy, list their adverse reaction, precautions to be taken and contra – indication, formulation and route of administration.
CO2	To identify whether the pharmacological effects of the drug interfere with Therapeutic response of Physiotherapy & vice a versa.
CO3	To indicate the use of analgesics & anti-inflammatory agents with the movement disorders with consideration of cost efficiency & safety for individuals need.
CO4	Aware of other essential & commonly used drug by patients –The basis for their use & common as well as serious adverse reaction.

**Course Contents**

**Unit – I**

1. Drugs acting of cardiovascular system
  - a. Cardiac glycosides
  - b. Anti-hypertensive drugs
  - c. Anti- anginal drugs
  - d. Anti-arrhythmic drugs
  - e. Anti-hyperlipidemic drugs
2. Drugs acting on respiratory system
  - a. Anti-asthmatic drugs
  - b. Antitussive and Expectorants

## **Unit – II**

1. Drug acting on Kidney
  - a. Diuretics
  - b. Antidiuretics
2. Drugs acting on blood and blood function
  - a. Anticoagulants
  - b. Fibrinolytic and Anti- platelet drug
  - c. Blood and plasma volume expanders

## **Unit – III**

1. Gastrointestinal drug
  - a. Drug for peptic ulcers.
  - b. Emetics and Anti-emetics.
  - c. Drug for constipation and Diarrhea.
2. Antimicrobial Drug
  - a. General consideration
  - b. Sulfonamides, clotrimazole, quinolones
  - c. Beta lactam antibiotics
  - d. Tetracyclines and chloramphenicol.
  - e. Aminoglycoside and Narcotics.
  - f. Anti-tubercular drugs.
  - g. Anti-malarial drugs
  - h. Anti-fungal drugs
  - i. Ant amoebic drugs
3. Drug acting on skin and mucous membrane

## **Unit -IV**

1. Antiseptics and disinfectants.
2. Hormones and drug affecting endocrine functions.
3. Vitamins
4. Diagnostic agents

## **BOOKS RECOMMENDED:**

1. Essential of Medical Pharmacology – 7<sup>th</sup> edition. Tripathi - Jaypee Brothers
2. Pharmacology – 9<sup>th</sup> edition. Gaddum
3. Medical Pharmacology – 3<sup>rd</sup> edition. Drill
4. Pharmacology Principle of Medical practice – 4<sup>th</sup> edition. Krantx& Carr
5. Pharmacological Basis of Therapeutics – 6<sup>th</sup> edition. Goodman, L.S. Gilman A.

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T – P	Credits
BPT 244	Advanced Exercise Therapy	PC	6- 0- 0	6

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.*

**Instructions for Paper Setters**

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.*

**Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	To define the various terms used in Mechanics, Biomechanics & Kinesiology, Recall the basic principles of Physics related to mechanics of movement/ motion
CO2	To acquire knowledge of Movements – Classification, Principles, and Techniques & Uses.
CO3	To acquire the skill of application of various massage manipulations & Describe Principles, Physiological effects, Therapeutic use, Merits & Demerits.
CO4	To acquire knowledge & skill of Relaxation

**Course Contents**

**Unit I**

1. Posture, Balance and Gait

1. Posture – Overview of mechanisms of normal posture.
2. Abnormal posture – Assessment, types, etiogenesis, management, including therapeutic exercise
3. Static and Dynamic Balance – assessment of management including therapeutic exercises
4. Gait – overview of normal gait and its components
5. Gait directions – assessment, types, etiogenesis and management including therapeutic exercises
6. Types of Walking aids: All types of crutches and uses, frames, walkers and sticks

## Unit II

### 1. Peripheral Joint Mobilization:

- a. Etiogenesis of joint stiffness
- b. Definitions of joint mobilization
- c. Basic concepts of joint motion
- d. Indications and goals for joint mobilization
- e. Limitation of joint mobilization and contraindication
- f. Procedures for applying joint mobilization
- g. Basic techniques of joint mobilization to the extremity joints

## Unit III

### 1. Yoga Therapy

- a. Conceptual framework, various “asana”, the body mind relationship, effects and precautions.
- b. Indications to Acute-Yoga and Meridians, Principles of Yoga and basic ten yogic postures and their physiological effects.
  - i. Padhstasana/Padangusthanasna/Trikonasana/Utkatasana.
  - ii. Padmasana/Siddhasana/Shirshasana
  - iii. Bhujangasna
  - iv. Ardha-salabhasana.
  - v. Paschimottanasana
  - vi. Savasana
  - vii. Dhanurasana, Ardhalhasana, Yogmudrasana, Virasana, Vajrasana, SetuBandhasana, Gomukhasana, PawanMuktasana, Halasana, Sarvangasna, Nawkasana.
  - viii. Pranayama Respiratory System and its care, Pranayama in standing position, Intercostals breathing: clavicular breathing, Diaphragmatic Breathing, vacuum breathing, Yoga Alternate breathing.

## Unit IV

### 1. Manual Therapy

- a. Vertebral Manipulation: Introduction to Mackenzie, Maitland and Mulligan methods.
  - b. Soft tissue manipulation Techniques: Classify, Define and Describe Effleurage, Stroking, Kneading, Petrissage, Deep Friction, Vibration etc.  
Transverse Friction, Digital Ischemic pressure, Physiological effects of soft tissue manipulation, Preparation of patient: Effects, uses, Indications and contraindications of the above manipulations
- ### 2. Special Techniques:
- Chill and stretch technique, induration’s technique, spondylotherapy, piriformis muscle technique, tensor fascia latté technique.

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T – P	Credits
BPT 244 P	Advanced Exercise Therapy Practical	PC	0- 0- 4	2

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.*

**Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	To describe & acquire the skill of use of various tools of the Therapeutic gymnasium
CO2	To acquire knowledge of different starting & derived positions
CO3	To acquire skill of assessment -Sensations, Superficial & Deep Reflexes, Pulse rate/ Heart rate, Blood Pressure, Chest Expansion, Respiratory Rate, Limb Length & Girth Measurement on Models
CO4	To describe Principles of Yoga, its types, its physiological & psychosomatic effects & demonstrate standard yoga postures used by the beginners
CO5	To demonstrate General Fitness exercises & understand principles of General Fitness

**Course Contents**

1. Normal and abnormal posture and practice various corrective techniques.
2. Equilibrium balance and various practice to improve balance
3. Use of various ambulation aids in gait training
4. Soft tissue manipulation technique region wise upper limb, lower limb, neck and face.
5. Various techniques of mobilization of joint region wise.
6. Effects of basic Yoga asanas

**BOOKS RECOMMENDED:**

1. Therapeutic Exercises – 4th edition. Basmajin – Williams & Wilkins
2. Practical Exercise Therapy – 4th edition. Hollis – Blackwell Scientific Publications
3. Therapeutic Exercises Foundations and Techniques – 7th edition. Kisner & Colby.
4. Therapeutic Massage – 2<sup>nd</sup> edition. A.G. Sinha – Jaypee Publications, New Delhi
5. Aquatic Exercise Therapy – 1st edition. Bates and Hanson – W.B. Saunders
6. Hydrotherapy: Principles and practices – Campion – 1<sup>st</sup> edition. Butterworth Heinmann
7. Principles of Exercise Therapy – 4<sup>th</sup> edition. Gardiner – C.B.S. Publishers, Delhi
8. Massage, Manipulation and Traction – Sydney Litch
9. Therapeutic Exercise – Sydney Litch
10. Biomechanics – 5<sup>th</sup> edition. Cynthia Norkin
11. Hydrotherapy – Duffield
12. Therapeutic Exercise – 5th edition. Basmajin and Wolf
13. Muscle Stretching and AutoStretching - Olaf Evjenth
14. William E. Prentice – Rehabilitation Techniques – Mosby
15. Werner Kuprian: Physical Therapy for Sports – W.B. Saunderson

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T – P	Credits
BPT 245	Advanced Electrotherapy	PC	6- 0- 0	6

**Course Assessment Methods (Internal: 30; External: 70)** One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

### **Instructions for Paper Setters**

For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.

### **Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be able to:
CO1	To describe the Physiological effects, Therapeutic uses, Merits/Demerits, Indications & Contraindications of Ultrasound, LASER Therapy, PCT and Biofeedback
CO2	To describe the Physiological effects & therapeutic uses of various therapeutic ions & topical pharmaco-therapeutic agents to be used for the application of Iontophoresis & Phono phoresies
CO3	To acquire the skill of Application of the Electro therapy modes on models, for the purpose of Treatment

### **Course Contents**

#### **Unit –I**

- Electrical reactions and electro-diagnostic tests:
  - Electrical stimulation and electrical properties of nerve and muscle.
  - Type of lesion and development of reaction of degeneration.
  - SD curves and its interpretation.
  - Chronaxie, rheobase and pulse ratio
- Ultra violet rays (UVR) – Wavelength, frequency, types and source of UVR generation, technique of irradiation. Physiological and therapeutic effects, dosimetry of UVR.

#### **Unit-II**

- Ultrasonic Therapy: Physical principles, physiological effects, indications, contraindications, parameters, modes, treatment procedures, phonophoresis, pharmacological agents for phonophoresis.
- LASER Therapy: Physical characteristics, classification and types of laser, physical effects, modes, parameter settings, types of probes used, seeming laser, indications, contraindications

and treatment procedures in orthopedics, sports medicine, ENT, dermatology and gynecological conditions.

### Unit-III

1. Therapeutic Mechanical Pressure: Intermittent Pneumatic therapy – methods of applications, principles, physical effects, indications and contraindications.
2. Biofeedback: General principles, biofeedback instrumentation, indications, EMG Biofeedback, equipment set up and application, treatment objectives, biofeedback in rehabilitation use in neuromuscular reduction.

### Unit-IV

1. Computerization of modalities
2. Combination of different modalities
3. Progressing of parameters
4. Selection and consideration of parameters
5. Combination therapy – principles, uses and indications of ultrasonic and electrical stimulator, Laser and electrical stimulator, Ultrasonic and laser and electrical stimulator.

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T – P	Credits
BPT 245 P	Advanced Electrotherapy Practical	PC	0- 0- 4	2

#### Course Assessment Methods (Internal: 30; External: 70)

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.*

#### Course Objectives & Course Outcomes

S.No.	At the end of the semester, the students will be able to:
CO1	To acquire the skill of Application of the Electro therapy modes on models, for the purpose of Treatment
CO2	To acquire an ability to select the appropriate mode as per the tissue specific & area specific application

#### Course Contents

1. Sensory and motor stimulation of nerves and muscles by various types of low frequency currents on self.
2. Locate and stimulate different motor points region wise, including upper limb, lower limb, trunk and face.
3. Therapeutic application of different low frequency currents, faradic foot bath, faradism under pressure, iontophoresis.
4. Reaction of degeneration of nerves, Plot strength duration curves, chronaxie and rheobase.

5. Different types of ultraviolet units, their operation, and assessment for test dose and application of UVR region wise.
6. Ultrasound unit, its operation and methods of application region wise.
7. Laser unit, its operation and methods of application region wise.
8. Intermittent pneumatic therapy unit – its operation and different methods of application region wise.

**BOOKS RECOMMENDED:**

1. Electrotherapy Explained: Principles and practice –4<sup>th</sup>edition. Low & Reed – Butterworth Heinmann
2. Clayton's Electrotherapy –12 edition. Kitchen &Bazin – W.B. Saunders
3. Therapeutic Heat and Cold – 4<sup>th</sup> edition.Lehmann – Williams & Wilkins
4. Principles & Practice of Electrotherapy – 4<sup>th</sup> edition.Kahn – Churchill Livingstone
5. Electrotherapy: Clinics in Physical therapy – Wolf – Churchill Livingstone
6. Physical Principles Explained –4<sup>th</sup>edition. Low & Reed – Butterworth Heinmann
7. Clinical Electrotherapy – 3<sup>rd</sup> edition.Nelson & Currier
8. Electrotherapy in Rehabilitation – Meryl Roth Gerth. F.A. Davis
9. Michlovitz – 3<sup>rd</sup> edition.Thermal agents in Rehabilitation
10. Therapeutic Modalities in Sports Medicine – William E Prentice – Mosby
11. Rehabilitation Techniques – William E Prentice - Mosby

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 246	Psychiatry	PC	3- 0- 0	3

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.*

**Instructions for Paper Setters**

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.*

**Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the students will be
CO1	To identify various Psychiatric disorders with special emphasis to movement /Pain & ADL- describe the various causative factors & methods of assessment & management
CO2	To acquire the knowledge in brief about the pathological & etiological factors, signs & symptoms & management of various Psychiatric conditions
CO3	To describe in brief the various treatment modalities commonly used

**Course Contents**

**Unit-I**

1. Brief description of epidemiology and etiological factors.
2. Classification of psychiatric disorders.
3. Clinical Interview (MSE).

**Unit-II**

1. Brief description of clinical syndromes (organic psychiatric disorders, substances, abuse, hysterical convulsion disorder, schizophrenia, affective disorders) Neurotic, stress related and soma to form disorder, eating disorders, sleeping disorders, mental disorders, personality disorders.
2. Mental Retardation.
3. Brief description of psychological and physical treatments used.

### **Unit-III**

1. Surgery in psychiatric conditions.
2. Definition: Defense Mechanisms and Symptomatology.
3. Generalized Anxiety Disorders Panic Disorders Dementia.

### **Unit-IV**

1. Psychiatric problems in general hospital community psychiatry, hospital aspects of Psychiatry.
2. Psychotherapy and Electro-convulsive therapy

### **BOOKS RECOMMENDED:**

1. Concise Guide to Clinical Psychiatry [APP.] - 3<sup>rd</sup> edition. Kaplan and Saddock, Crabbard.
2. Treatments of psychiatric Disorders (2 Vols) 2<sup>nd</sup> edition. Edited: Crabbard.
3. Essentials of Clinical Psychiatry – 2<sup>nd</sup> edition. Hales.
4. Psychiatry at a Glance - 6<sup>th</sup> edition. Edited: Robertson.
5. Recent Advances in Psychiatric (vol.I), 1<sup>st</sup> edition. Edited: Ahuja.
6. Short textbook of psychiatry- 7th edition. Niraj Ahuja-Jaypee.

## BACHELOR OF PHYSIOTHERAPY: SECOND YEAR

### SEMESTER V

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T – P	Credits
BPT 351	Neurology – I	PC	4-0-0	4

#### Course Assessment Methods (Internal: 30; External: 70)

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks.*

#### Instructions for Paper Setters

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.*

#### Course Objective & Course Outcomes

S.No.	At the end of the semester, the student will be able:
CO1	Anatomy & physiology of brain, assessment & management of neurological patients
CO2	Understand the Neuro-anatomy of the brain and spinal cord including Blood supply of the brain and spinal cord anatomy of the visual pathway
CO3	Understand the Cerebrovascular accidents – General classification and management
CO4	Brief the neurophysiological basis of tone and disorders of tone and posture.

#### Course Contents

##### Unit-I

1. Neuro-anatomy: Review the brain and spinal cord including Blood supply of the brain and spinal cord anatomy of the visual pathway, Connections of the cerebellum and extra pyramidal relationship to the Spinal, nerves to the spinal cord segment systems, Long tracts of the spinal cord, the brachial and lumbar plexus and cranial nerves.

2. Neurophysiology: Review in brief the neurophysiological basis of tone and disorders of tone and posture, bladder control, muscle contraction, movement and Pain.

### Unit-II

1. Assessment and evaluative procedures for neurological patient.
2. Review of the management of a neurological patient.
3. Congenital and childhood disorder, cerebral palsy, Hydrocephalus and Spina Bifida
4. Cerebrovascular accidents – General classification, thrombotic, embolic, haemorrhagic. And inflammatory strokes, gross localization and sequelae.

### Unit-III

1. Trauma – localization, first aid and management of sequelae of head injury and spinal Cord injury.
2. Disease of the spinal cord – Craniovertebral junction anomalies, Syringomyelia, cervical and lumbar disc lesions, Tumours and Spinal arachnoiditis.

### Unit-IV

1. Demyelinating diseases (Central and Peripheral): Guillain–Barre syndrome, Acute Disseminated encephalomyelitis, Transverse mellitus and Multiple sclerosis.
2. Degenerative disorders – Parkinson’s diseases and dementia.
- 3.

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T – P	Credits
BPT 351 P	Neurology-I (Practical)	PC	0-0-2	1

### Course Assessment Methods (Internal: 30; External: 70)

*One minor test each of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks.*

### Course Objective & Course Outcomes

S.No.	At the end of the semester, the student will be able to:
CO1	Acquire the skill of history taking and clinical examination of neurological conditions.
CO2	Briefly outlines the etiopathogenesis, clinical features and management of the various Neurological Disorders.

## **Course Contents**

1. Motor and sensory examination of neurological disorders
2. Knowledge of various investigative procedures (invasive and non-invasive) used in the diagnosis of various neurological disorders
3. Assessment of Hemiplegia, cerebral palsy and multiple sclerosis.

## **BOOKS RECOMMENDED**

1. Brain's Diseases of the Nervous System – Nalton – ELBS.
2. Guide to Clinical Neurology – Mohn&Gaectier - Churchill Living Stone.
3. Principles of neurology – Visitors – McGraw – International Edition.
4. Davidson's Principles and Practices of Medicine – Edward – Churchill Living Stone (22<sup>nd</sup> edition).

Course Code	Subject	Title	Teaching Hours/ Week	
			L-T -P	Credits
BPT 352	General Surgery including Gynaecology & Obstetrics	PC	4- 0- 0	4

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks.*

**1. Instructions for Paper Setters**

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.*

**Course Objective & Course Outcomes**

S.No.	At the end of the semester, the student will be able to:
CO1	General scheme of case taking history, physical examination, investigations, progress, follow-up, termination and surgeries of the disorders.
CO2	Classify, clinically evaluate and describe the surgical management in brief in a) wounds b) ulcers and c) burns.
CO3	Acquire knowledge in brief about intra uterine development of the fetus.

**Course Contents**

**Unit-I**

1. Identification and description of the instruments used for investigation and practice.
2. Wound healing and wound management
3. Wound infections
4. Accident and emergency surgery, warfare injuries
5. Acute and long-term resuscitation and support
6. Immunology and organ transplantation
7. Tumours, ulcers, cysts and sinuses
8. Burns
9. Arterial and venous disorders
10. Lymph nodes and Lymphatic disorders

## **Unit-II**

1. Cardio-respiratory resuscitation.
2. Thymus-tumors and management
3. Chest injuries and diseases of the chest wall
4. Diseases of the pleura: Pleural Effusion, Pneumothorax and Pleuritis
5. Trachea
6. Diseases of lungs and bronchi
7. Postoperative pulmonary complications
8. Diaphragmatic disorders
9. Mediastinal tumors
10. Cardiac surgeries (extra-cardiac, closed intracardiac, open cardiac operations)
11. Diseases of Pericardium
12. Congenital Heart Diseases and Acquired Heart Diseases
13. Aortic Aneurysm
14. Cardiac Thoracic trauma
15. Skeletal cardiomyoplasty
16. Cardiac Transplantation
17. Heart Lung Transplantation
18. Mechanical circulatory support

## **Unit-III**

1. History taking and Terminologies used
2. Classification of diseases
3. Birth Control
4. Reproduction
5. Placenta and placental Membranes
6. Foetus
7. Physiological changes during pregnancy
8. Endocrinology in relation to reproduction
9. Foetus-in-utero
10. Foetal skull and maternal pelvis

## **Unit-IV**

1. Antenatal care
2. Antenatal assessment of foetal well-being
3. Normal labour, normal Puerperium
4. Complications of pregnancy and labour
5. Special considerations (previous history of C-Section, RH – elderly, Primigravida, grand multipara, bad obstetric history, obesity)
6. Term, new-born infant, low birth weight baby.
7. Diseases of the foetus and new-born.
8. Pharmacotherapeutics, induction of labour, operative obstetrics.
  - a) Special topic (foetal distress, intrapartum foetal monitoring, shock in Obstetrics, acute renal failure, blood coagulation disorders, high risk Pregnancy, immunology in obstetrics).
  - b) Aids to diagnosis in obstetrics.

## **BOOKS RECOMMENDED**

1. Love & Bailey's Short Practice of Surgery – Clinical examination. (26<sup>th</sup> edition)
2. Shaw's - Text Book of Gynaecology. (16<sup>th</sup> edition)
3. Textbook of obstetrics- D.C. Dutta. (9<sup>th</sup> edition 2017)

Course Code	Subject	Title	Teaching Hours/ Week	
			L-T -P	Credits
BPT 353	Biomechanics and Kinesiology - I	PC	4- 0- 0	4

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks.*

**Instructions for Paper Setters**

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.*

**Course Objective & Course Outcomes**

S.No.	At the end of the semester, the student will be able to:
CO1	General scheme of body mechanics, muscle, Joint structure and function.
CO2	Identify, analyze, and solve various biomechanical problems.
CO3	Demonstrate an understanding of kinetic concepts including inertia, force, torque and impulse
CO4	Identify the major factors involved in the angular kinematics of human movement.
CO5	Define Newton's laws of physics.

**Course Contents**

**Unit -I**

1. Introduction to mechanic including motion, forces, parallel force System and vectors
2. Newton's law of motion, concurrent force system – composition of forces, Muscle action line etc.
3. Center of gravity, line of gravity, stability and equilibrium, law of inertia.
4. Levers, torque, mechanical advantage
5. Moment arm and anatomic pulleys

## **Unit –II**

1. Basic principles of human joint design
  - a. Tissues present in human it including dense fibrous tissue, bone, cartilage and conductive tissue
  - b. Classification of joint
  - c. Joint function, kinematic chains and range of motion
  - d. General effects of injury and disease

## **Unit –III**

1. Mobility and Stability function of Muscle
2. Elements of Muscle Structure and Its properties
3. Factors affecting Muscle Tension
4. Type of Muscle Contraction and Muscle Work
5. Classification of Muscle and their Function
6. Group Action of Muscle, Co-ordination of Movement

## **Unit –IV**

1. Shoulder complex
2. Elbow complex
3. Wrist and hand complex

## **BOOKS RECOMMENDED**

1. Norkin& Leonie-joint structure and function. (5<sup>th</sup> edition)
2. A comprehensive analysis – FA. Davis. (5<sup>th</sup> edition)
3. Burnstorm – Clinical Kinesiology – FA. Davis (6<sup>th</sup> edition)
4. Kreighbaun E., Barthels, K.: Biomechanics – A Qualitative approach for Studying Human Motion, Mac Millan (4<sup>th</sup> edition)
5. Rasch& Burk: Kinesiology and Applied Anatomy – Lee and fabiger (5<sup>th</sup> edition)
6. Levac B.F.: Basis of Biomechanics in Sports and Orthopedic Therapy – C.V. Mosby
7. De Boor & Groot: Biomechanics of Sports, CRI Press, Florida
8. Norden& Frankel: Basis of Biomechanics of Muscular Skeletal System – Williams and Wilkins (4<sup>th</sup> edition)
9. Laughens K., Hamilton N. Kinesiology – Scientific Basis of Human Motion – Brown and Benchmark. (11<sup>th</sup> edition)

Course Code	Subject	Title	Teaching Hours/ Week	
			L-T -P	Credits
BPT 354	Physical Assessment & Manipulative Skills - I	PC	6- 0- 0	6

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.*

**Instructions for Paper Setters**

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.*

**Course Objectives & Course Outcomes**

S.No.	At the end of the semester, the student will be able to:
CO1	To understand the production, effects and uses of direct and alternating currents
CO2	To understand plan of therapeutic programme for evaluation of Shoulder, Forearm-Complex, Wrist and Hand, Hip, Knee, Ankle and Foot.
CO3	To acquire the knowledge about the anatomical directional pattern-Cephalo-caudal, Proximal-distal, center-lateral,
CO4	Physiology of generation & propagation of Action potential, volume conduction.

**Course Contents**

**Unit-I**

1. General principles of human development and maturation.
2. Aspects – physical, motor, sensory, cognitive, emotional, cultural and social.
3. Factors influencing human development and growth – Biological Environment, inherited.
4. Principles of maturation-
  - a. In general
  - b. In anatomical directional pattern-Cephalo-caudal, Proximal-distal, center-lateral, Mass to specific pattern, gross to fine
  - c. Neuro Development of Hand function

## Unit-II

1. Bioelectricity: Physiology of generation & propagation of Action potential, volume conduction.
2. Therapeutic current – as a tool for electrodiagnosis
3. Physiological principles & use of alternating & direct current, such as sensory & pain threshold, Pain Tolerance, short & long pulse test
4. S.D. Curve, Integrated EMG, use of Biofeedback unit for assessment of muscle function
5. Principles of Electromyography-Motor unit and its Characteristics-activity at rest, recruitment/frequency pattern at minimal activity, Interference pattern abnormal EMG. pattern
6. Principles of nerve conduction
7. Late responses-F-wave, H reflex, Blink reflex.
8. Electro-physiological principles of assessment of myoneural junction.
9. EMG: instrumentation, basic components, panel diagram, types of electrodes.

## Unit-III

1. Assessment and Evaluation of a patient (region wise) to plan a therapeutic programme –  
Evaluation and Therapy region wise: Shoulder, Forearm-Complex, Wrist and Hand, Hip, Knee, Ankle and Foot.

## Unit-IV

1. Assessment of cardio pulmonary dysfunction-Chest expansion, Abnormal breath sounds, Quality of life questionnaires/Borg scale/Principles of exercise tolerance test-assessment of vital parameters in simple functional test-6-minute walk test/symptom limited test/Breath holding test Spirometry Peak-flowmetry – Theoretical basis of Bruce's protocol, A strand protocol, and step test.
2. Assessment of Hand – pinches, grips, routine sensory & motor evaluation, stereognosis.

Course Code	Subject	Title	Teaching Hours/ Week	
			L-T -P	Credits
BPT 354 P	Physical Assessment & Manipulative Skills-I (Practical)	PC	0- 0- 4	2

### Course Assessment Methods (Internal: 30; External: 70)

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks.*

### Course Objective & Course Outcomes

S.NO.	At the end of the semester, the student will be able to:
CO1	General principles of human development & maturation, electro diagnosis and assessment & evaluation of a patient.
CO2	Describe the assessment tools used to perform a physical assessment.
CO3	Identify the pertinent information that should be obtained by the therapist to complete the patient's history.

1. Electro-diagnostic assessment using short/long pulse direct currents, alternating currents and biofeedback for:

- a) Motor function-Galvanic/Faradic type test/accommodation test/SD curves/ Integrated EMG.
- b) Sensory function-sensory and pain threshold, pain tolerance.
- c) Identification of abnormal breath sounds/chest expansion/pattern of breathing/Respiratory rate/Grades of Dyspnoea/Rate of Perceived exertion.
- d) Basic skill development of Manual therapy for extremities.

### **BOOKS RECOMMENDED**

1. Maitland's Book on Manual Therapy
2. Clinical Electro Therapy – Nelson Currier – Appleton and Lange Publication (3<sup>rd</sup> edition 1999)
3. Clinical Electromyography – Mishra (3<sup>rd</sup> revised edition 2014)
4. Mobilization – Kaltenborn (8<sup>th</sup> edition 2014)
5. Manual Examination of Spine and Extremities – Wads Worth
6. Orthopaedic Physical Examination – Magee (6<sup>th</sup> edition)
7. Mobilization Methods – Kaltonborn
8. Mulligans Manual Therapy (7<sup>th</sup> edition)
9. Clinical Electrical myography – Kimura (5<sup>th</sup> edition)
10. Orthopaedic Physical Therapy – Donnatelli (4<sup>th</sup> edition)
11. Exercise and heart – Wenger
12. Exercise Physiology – M. Cardel (8<sup>th</sup> edition)
13. Susan D.O. Sullivan & Thomas J. Schmitz- Physical Rehabilitation (5<sup>th</sup> edition)

Course Code	Subject	Title	Teaching Hours/ Week	
			L-T -P	Credits
BPT 355	Physiotherapy in Orthopedic Conditions - I	PC	6- 0- 0	6

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.*

**Instructions for Paper Setters**

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.*

**Course Objectives & Course Outcomes**

S/NO.	At the end of the semester, the student will be able to:
CO1	Discuss the patho-physiology, clinical manifestations and conservative/surgical management of various traumatic and non-traumatic cases of the Musculo-skeletal conditions
CO2	Gain the skill of clinical examination and interpretation of the preoperative cases and all the post-operative cases
CO3	Understand about the assessment, medical & physiotherapy management and treatment goals & plan of the conditions.

**Course Contents**

**Unit-I**

1. Assessment of patients
2. Setting of treatment goals and plans
3. Principal of treatment soft tissue bone and joint problems
4. Identifying soft tissue lesions
5. State of inflammation and repair

6. Clinical feature and treatment during acute stage of soft tissue lesions
7. Clinical feature and treatment during sub-acute stage of healing
8. Clinical feature and treatment during chronic remodelling stage
9. Recurring pain – Treatment guidelines

## Unit-II

1. General physiotherapy approach
2. Principles of fracture management at different stages
3. Prevention & management of complication of fractures
4. Fracture, Dislocation & soft tissue injuries: Sign, symptom, common sites, assessment & Physiotherapeutic management.
5. Upper limb trauma
6. Lower limb trauma

## Unit-III

1. Fracture, Dislocation & soft tissue injuries: Sign, symptom, common sites, assessment & Physiotherapeutic management of Spinal trauma.
2. Assessment, management & Treatment goals of amputation. Level of amputation, stump care, Bandaging, Pre- and post- Prosthetic management, prosthetic checkout, complication and the management
3. Review of the condition, assessment, management and treatment goals & plan of the Congenital deformities: Torticollis, Thoracic inlet/outlet syndrome, CTEV, foot deformities, Developmental Dysplasia of the Hip

## Unit-IV

1. Acquired Deformities: Deformities of Spine, Knee, Hip, Ankle, Shoulder, Elbow, Hand, etc
2. Bone and Joint Tuberculosis
3. Diseases of the joint: Osteoarthritis, Rheumatoid arthritis, Ankylosing spondylitis, Reiter's disease, Gout.

Course Code	Subject	Title	Teaching Hours/ Week	
			L-T -P	Credits
BPT 355 P	Physiotherapy in Orthopedic Conditions-I (Practical)	PC	0- 0- 4	2

### Course Assessment Methods (Internal: 30; External: 70)

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks.*

### Course Objective & Course Outcomes

S.NO.	At the end of the semester, the student will be able to:
CO1	Read and interpret a) salient features of the x-ray of the spine and extremities, b) pathological / biochemical studies pertaining to orthopedic conditions.
CO2	To Correlate the radiological findings with the clinical findings.
CO3	To acquire the knowledge about the methods to evaluate the injury cases and their management

### Course Contents

1. The students will be shown patients of the relevant diseases and disorders for:
  - a. History taking of condition
  - b. Soft tissue lesions
  - c. Degenerative arthritis of joints
2. Evaluation of Injury cases and management

### **BOOKS RECOMMENDED:**

1. Orthopedic Physical Therapy – Donatelli (4<sup>th</sup> edition)
2. Cash's Text Book of Orthopaedics and Rheumatology for Physiotherapists – Jaypee Brothers (2<sup>nd</sup> edition)
3. Manual Mobilization of Extremity Joints – FredyKaltenborn, Maitland (8<sup>th</sup> edition)
4. Therapeutic Exercises – Kolby and Kisner (17<sup>th</sup> edition)
5. Therapeutic Exercises – O'Sullivan (6<sup>th</sup> edition)
6. Taping techniques – Rose Mac Donald (2<sup>nd</sup> edition)
7. Tissue Neural Mobilization – Butler (4<sup>th</sup> edition)
8. Zulunga et al.: Sports Physiotherapy - W.B. Saunders (6<sup>th</sup> edition)
9. Brukner and Khan: Clinical Sports Medicine – Mac Graw Hill (3<sup>rd</sup> edition)
10. Reed: Sports Injuries – Assessment and Rehabilitation – W.B. Saunders (3<sup>rd</sup> edition)
11. Gould: Orthopedic Sports Physical Therapy – Mosby
12. C. Norris: Sports Injuries – Diagnosis and Management

Course Code	Subject	Title	Teaching Hours/ Week	
			L-T -P	Credits
<b>BPT 600</b>	<b>Clinical Training</b>	<b>PC</b>	<b>0- 0- 4</b>	<b>2</b>

**Course Assessment Methods (Internal: 100)**

The students shall undergo clinical training in recognised physiotherapy unit for a period not less than 2hrs/day and 5 days a week (Total 240 hrs.)O.P.D set ups under the supervision of Senior Physiotherapist. A Register/Log book shall be maintained by student to document the Evaluation/Functional Analysis and Functional Diagnosis Reports of minimum 5 cases per assignment and signature to be obtained from respective Section-in-charge at the end of each assignment for submission to the chairman.

**Course Outcomes**

<b>CO1.</b>	This course provides the student to develop initial patient contact skills and apply directed components of basic data collection and intervention techniques.
<b>CO2.</b>	Students will able to review the physical therapy documentation including the goals, and objectives; identifying major indications, contraindication, precautions and safety issues and identifying patient goals and outcomes in the documents
<b>CO3.</b>	Students will describe safe environments, appropriate risk management strategies, and emergency responses/support activities to take when the safety of self, patient or others is at risk in the clinical setting.
<b>CO4.</b>	Students will be able to describe communication processes within the clinical arena including referral process, patient delegation, review of records, between health care team members, and methods for reporting patient status.
<b>CO5.</b>	Students will engage in clinical training in hospital based medical and physiotherapy departments/ settings to enhance their clinical skills and apply contemporary knowledge gaining during teaching sessions.

## BACHELOR OF PHYSIOTHERAPY: THIRD YEAR

### SEMESTER VI

Course Code	Subject	Title	Teaching Hours/ Week	
			L-T -P	Credits
BPT 361	Neurology – II	PC	4- 0- 0	4

#### Course Assessment Methods (Internal: 30; External: 70)

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks.*

#### Instructions for Paper Setters

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.*

#### Course Objective & Course Outcomes

S.NO.	At the end of the semester, the student will be able to:
CO1	Understand Anatomy, physiology of brain, assessment & management of neurological patients
CO2	Briefly outlines the etio-pathogenesis, clinical features and management of the various Neurological Disorders.
CO3	Demonstrate proficiency at performing an appropriately focused and reliable neurological examination in both the ambulatory and hospital settings including mental status, cranial nerves, motor function, sensation, reflexes, coordination and gait.
CO4	Demonstrate understanding of how to approach and examine the patient with altered level of consciousness.

#### Course Contents

##### **Unit-I**

1. Briefly outline the etio-pathogenesis, clinical features and management of the following Neurological disorders.
2. Infections – Pyogenic Meningitis sequelae, Tuberculosis infection, Central Nervous System and Poliomyelitis.

3. Degenerative disorder – Parkinson’s disease and Dementia.
4. Diseases of the muscles – Classification, Signs, Symptoms, Progression and Management.

### Unit-II

1. Briefly outline the etio-pathogenesis, clinical features and management of the following Neurological disorders.
  - a) Peripheral nerve disorders – Peripheral Nerve Injuries, Entrapment Neuropathies and Peripheral Neuropathies.
  - b) Epilepsy – Classification and Management.
  - c) Myasthenia Gravis – Definition, Course and Management.

### Unit-III

1. Briefly outline the etio-pathogenesis, clinical features and management of the following Neurological disorders.
  - a) Intracranial Tumors: Broad Classifications, Signs and Symptoms.
  - b) Motor Neuron Disease: Definition, Classification and Management.
  - c) Cranial Nerve: Types of Disorders, Clinical Manifestations and Management.
  - d) Acquired Immuno Deficiency Syndrome: Clinical Manifestation.

### Unit-IV

1. Introduction to Neuro-psychology.
2. General Assessment procedure and Basic Principles of Management

Course No	Subject	Title	Teaching Hours/ Week	
			L–T –P	Credits
BPT 361 P	Neurology-II (Practical)	PC	0- 0-2	1

### Course Assessment Methods (Internal: 30; External: 70)

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks.*

### Course Objective & Course Outcomes

S.NO.	At the end of the semester, the student will be able:
CO1	Demonstrate the ability to document a history and physical and neurological examination.
CO2	Demonstrate knowledge of common seizure and terminology, common seizure syndromes and approach to the patient with first time seizure.
CO3	Demonstrate ability to recognize common movement disorders and tremors (Parkinson's Disease, Huntington's, ataxia)
CO4	Demonstrate knowledge of the approach to common neurological emergencies including acute stroke, status epilepticus, myasthenic crisis, Guillain Barre, and acute altered mental status.

## **Course Contents**

- a) Motor and Sensory Examination of Neurological Disorders.
- b) Knowledge of various investigative procedures (invasive and noninvasive) used in the diagnosis of various neurological disorders.
- c) Assessment of peripheral nerve disorders, Poliomyelitis and other mentioned neurological disorders

## **BOOKS RECOMMENDED**

1. Brain's Diseases of the Nervous System – Nalton – ELBS.
2. Guided to clinical Neurology – Mohn&Gaectier - Churchill Living Stone.
3. Principles of neurology – Visitors – McGraw – International Edition.
4. Davidson's Principles and Practices of Medicine – Edward – Churchill Living Stone (22<sup>nd</sup> edition).

Course Code	Subject	Title	Teaching Hours/ Week	
			L-T -P	Credits
BPT 362	General Surgery including Eye & ENT	PC	4- 0 -0	4

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.*

**Instructions for Paper Setters**

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.*

**Course Objectives & Course Outcomes**

S.NO.	At the end of the semester, the student will be able to:
CO1	Understand general scheme of case taking history, physical examination, investigations, progress, follow-up, Termination and surgeries of the disorders
CO2	Acquire knowledge of structure and function of the eye.
CO3	Describe etiology, patho-physiology, sign and symptoms and clinical evaluation of common ophthalmic(eye), ear, nose and throat conditions related to Physiotherapy

**Course Contents**

**Unit-I**

1. Eye

- a) Brief description of anatomy and physiology of the eye.
- b) Ophthalmic optics and brief description of examination.
- c) Diseases of the eye and addenda of the eye.
- d) Disorders of motility of the eye.

- e) Ocular manifestations of diseases of the nervous system.
- f) Brief description of immunopathology of the eye.
- g) Preventive ophthalmology.

## **Unit-II**

### 1. Ear

- a) Brief description of anatomy and physiology, peripheral receptors and central neural pathways of auditory and Vestibular system.
- b) Audiology and acoustics.
- c) Brief description of assessment of hearing.
- d) Hearing loss.
- e) Assessment of Vestibular functions.
- f) Disorders of Vestibular system.
- g) Diseases of the external and middle ear.
- h) Otosclerosis.
- i) Facial nerve and its disorders
- j) Brief description of meniere's disease, acoustic neuroma, otalgia, tinnitus
- k) Tumors of external ear, middle ear, and mastoid

## **Unit-III**

### 1. Nose and paranasal sinuses

- a) Brief description of anatomy and physiology
- b) Classification of diseases and disorders
- c) Rhinitis (acute, chronic, allergic, other forms of non-allergic rhinitis)
- d) Trauma to the face
- e) Sinusitis

## **Unit-IV**

### 1. Throat

- a) Brief description of diseases of the oral cavity, salivary glands, pharynx, larynx, trachea, Esophagus.
- b) Brief description of the techniques used.
- c) Brief description of clinical examination.
- d) Indications and types of operative surgery.
- e) Instrumentation.

## **BOOKS RECOMMENDED**

1. Bailey & low's Short Practice of Surgery – Clinical examination. (26<sup>th</sup> edition)
2. Shaw's - Text Book of Gynaecology. (16<sup>th</sup> edition)
3. Textbook of obstetrics- D.C. Dutta. (9<sup>th</sup> edition)

Course Code	Subject	Title	Teaching Hours/ Week	
			L–T –P	Credits
BPT 363	Biomechanics and Kinesiology-II	PC	4- 0- 0	4

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks.*

**Instructions for Paper Setters**

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rest of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.*

**Course Objectives & Course Outcomes**

S.NO.	At the end of the semester, the student will be able to:
CO1	General scheme of body mechanics, muscle, Joint structure and function.
CO2	Analyze normal human posture and its associated problems.
CO3	Analyze the various normal musculoskeletal movements during gait and daily living activities and in terms of biomechanical principles.

**Course Contents**

**Unit-I**

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

1. Description of normal gait, determinants of gaits, spatio temporal features, and analysis
2. Gait Deviations: Types, Causative Factors and Analysis

## **Unit-II**

1. Regional Structure and Function: The vertebral column

## **Unit-III**

1. Regional Structure and Function Hip Complex

## **Unit-IV**

1. Regional Structure and Function: Knee Complex, Ankle and Foot complex

## **BOOKS RECOMMENDED**

1. Norkin& Leonie-joint structure and function. (5<sup>th</sup> edition)
2. A comprehensive analysis – F.A. Davis. (5<sup>th</sup> edition)
3. Burnstorm – Clinical Kinesiology – F.A. Davis (6<sup>th</sup> edition)
4. Kreighbaun E., Barthels, K: Biomechanics – A Qualitative approach for Studying Human Motion, Mac Millan (4<sup>th</sup> edition)
5. Rasch& Burk: Kinesiology and Applied Anatomy – Lee and fabiger (5<sup>th</sup> edition)
6. Levac BF: Basis of Biomechanics in Sports and Orthopedic Therapy – C.V. Mosby
7. De Boor & Groot: Biomechanics of Sports, CRI Press, Florida
8. Basmajian: Muscle Alive – Williams and Wilkins
9. Norden& Frankel: Basis of Biomechanics of Muscular Skeletal System – Williams and Wilkins (4<sup>th</sup> edition)
10. Laughens K., Hamilton N.: Kinesiology – Scientific Basis of Human Motion – Brown and Benchmark. (11<sup>th</sup> edition)

Course Code	Subject	Title	Teaching Hours/ Week	
			L-T -P	Credits
BPT 364	Physical Assessment & Manipulative Skills - II	PC	6- 0- 0	6

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks.*

**Instructions for Paper Setters**

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rest of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.*

**Course Objectives & Course Outcomes**

S.NO.	At the end of the semester, the student will be able to:
CO1	To understand about the general principles of manual therapy
CO2	General principles electrodiagnosis
CO3	Assessment & evaluation of a patient.
CO4	To acquire the knowledge about the reading of Imaging studies of different joints.

**Course Contents**

**Unit-I**

1. Basics in Manual Therapy, and application in Clinical reasoning
2. Examination of joint – stability – normal/abnormal, Mobility-assessment of accessory movement and End feel
3. Assessment of articular and extra-articular soft tissue status-differentiation of spasm, acute and chronic muscle hold, tightness/pain-original and Referred
4. Interpretation of various investigations like – Radiological [X-rays], routine Biochemical investigations, Electrodiagnosis
5. Assessment of pain – Intensity/quality-Objective assessment/documentation.

## **Unit-II**

1. Basic principles of mobilization skills for joints and soft tissues:
2. Maitland
3. Kaltenborn
4. Mulligan
5. Mc'kenzie
6. Muscle energy technique
7. Myofascial stretching
8. Cyriax, trigger points
9. Neural tissue mobilization i.e.-slump, butler, and ULTT
10. Indications, contra-indications, Practice of Manipulative therapy basic skills of mobilization of extremities on Models:-
  - a) Kaltenborn
  - b) Mulligan
  - c) Maitland
  - d) Cyriax friction massage

## **Unit-III**

1. Introduction to motor learning
2. Classification of motor skills.
3. Measurement of motor performance.
4. Introduction to motor control
5. Theories of motor control
6. Applications
7. Learning Environment
8. Learning of skill

## **Unit-IV**

1. Assessment of movement dysfunction
2. Higher functions
3. Cranial nerves
4. Altered muscle strength
5. Power
6. Balance
7. Endurance
8. Tone
9. Spasticity
10. Incoordination
11. Abnormal deep and superficial reflexes
12. Limb-length discrepancy
13. Goniometry
14. Trick movements
15. Special Tests
16. Assessment Scales
17. Altered Posture and Gait
18. Functional analysis as per I.C.I.D.H.-II norms
19. Functional diagnosis

Course Code	Subject	Title	Teaching Hours/ Week	
			L-T -P	Credits
BPT 364 P	Physical Assessment & Manipulative Skills Practical - II	PC	0- 0-4	2

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks.*

**Course Objective & Course Outcomes**

S.NO.	At the end of the semester, the student will be able to:
CO1	General principles of manual therapy, electrodiagnosis and assessment & evaluation of a patient.
CO2	Demonstrate effective history taking, examination, evaluation and investigations including radiological studies and electrodiagnostic studies.
CO3	To acquire the knowledge about the exercise tolerance and fitness testing.

**Course Contents**

1. Basic Skill development of manual therapy for Extremities
2. Exercise tolerance and fitness testing-6minutes walk test, Symptom limited test.
3. Interpretation of various investigations like X-rays, electro-diagnostic findings

**BOOKS RECOMMENDED:**

1. Maitland Book on Manual therapy,
2. Clinical Electro Therapy –Nelson-Currier – Applcton and Lange publication,
3. Clinical Electromyography-by Mishra. (3<sup>rd</sup> edition)
4. Mobilisation – Kaltenborn,
5. Mulligans Manual Therapy,
6. Manual Examination of Spine and Extremities by Wads Worth.
7. Orthopaedic Physical examination – Magee, (6<sup>th</sup> edition)
8. Clinical Electromyography – Kimura, (5<sup>th</sup> edition)
9. Orthopaedic Physical therapy – Donnatelli, (6<sup>th</sup> edition)
10. Exercise and Heart – Wenger,
11. Exercise Physiology – M’Cardal,(8<sup>th</sup> edition)
12. Susan B.O.Sullivan& Thomas J Schmitz- text book of Physical Rehabilitation (5<sup>th</sup> edition)

Course Code	Subject	Title	Teaching Hours/ Week	
			L-T -P	Credits
BPT 365	Physiotherapy in Orthopedics including Sports Medicine - II	PC	6- 0 – 0	6

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks.*

**Instructions for Paper Setters**

*For the end semester examination, nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the Four Units). It will contain seven short answer type questions each of two marks. Rests of the eight questions are to be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four units. All the questions including Qno.1 shall carry equal marks. Each question carries 14 marks.*

**Course Objective & Course Outcomes**

S.NO.	At the end of the semester, the student will be able to:
CO1	Review of the condition, assessment, management and treatment goals
CO2	Treatment plan of the following orthopaedic conditions.
CO3	Basic understanding of pathophysiology of acute injuries in the athletic population.
CO4	Basic knowledge of the pathophysiology of degenerative disorders of the upper & lower extremity.

**Course Contents**

**Unit-I**

Review of the conditions, assessment, management and treatment goals and plan for the following conditions:

1. Shoulder: Tendinitis, Periarthritis, Rotator Cuff Injury, Deltoid Fibrosis, Adhesive Capsulitis, Frozen Shoulder etc.
2. Elbow: Tennis Elbow, Golfer's Elbow, Recurrent Slipping of Ulnar Nerve, Pulled Elbow etc.

3. Wrist and Hand: Ganglion, DeQuervain's Disease, Trigger Thumb and Finger, Carpal Tunnel Syndrome, Dupuytren's Contracture etc
4. Spine: Cervical: Brachial Neuralgia, Brachial Plexus Injury, Thoracic outlet/Inlet Syndromes, Torticollis, Cervical Spondylitis, Prolapse Intervertebral Disk Syndrome, etc.

## **Unit-II**

Review of the conditions, assessment, management and treatment goals and plan for the following conditions:

1. Hip: Coxa Vara, Slipped Upper Femoral Epiphysis, AVN etc.
2. Knee: Deformities, Quadriceps Fibrosis, Recurrent Dislocation of the Patella, Osgood Schlatter's Disease, Loose Bodies, Anterior Knee Pain, Chondromalacia Patellae etc.
3. Foot and Ankle: Painful Heel, Plantar Fasciitis, Posterior Heel Pain, Deformities, Forefoot pain, metatarsalgia, tarsal tunnel Syndrome etc.
4. Peripheral Nerve Injuries: Outline the clinical features and management, including reconstructive surgery of Radial, Median and ulnar nerve lesions, Sciatic and lateral popliteal lesions, Brachial plexus injuries including Erb's, Klumpke's and crutch palsy.

## **Unit-III**

Pre and postoperative assessment and management of surgeries like:

1. Osteotomy, Arthrodesis, Arthroplasty, Joint replacements
2. Tendon transplant, soft tissue release, Grafting
3. Spinal stabilization, Reattachment of limbs, illizarov's technique

## **Unit-IV**

1. Introduction to Sports Physiotherapy
2. Introduction to Exercise Testing
3. Introduction to Body Composition Analysis
4. Basic Principles of Conditioning, Resistance Training, Exercise Physiology, Functional Rehabilitation
5. Introduction to Applied Biomechanics in Tennis, Running & Swimming
6. Introduction to protective gear used for spine, upper limb, and lower limb.
7. The athlete with a disability
8. Mechanism, prevention, assessment and physiotherapy and medical management of common sports injuries of Spine, Upper limb and lower limbs
9. Female Athlete
10. Introduction to Emergency care of a sports person
11. Taping and sports massage

Course Code	Subject	Title	Teaching Hours/ Week	
			L–T –P	Credits
BPT 365 P	Physiotherapy in Orthopedics including Sports Medicine Practical - II	PC	0- 0-4	2

**Course Assessment Methods (Internal: 30; External: 70)**

*One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc (6 marks) and end semester examination of 70 marks.*

**Course Objectives & Course Outcomes**

S.NO.	At the end of the semester, the student will be able to:
CO1	Knowledge of exercise physiology and its relevance to overall fitness & athletic performance.
CO2	Awareness of clinical signs and symptoms and presentation of common acute athletic injuries, as well as degenerative conditions about the upper and lower extremities

**Course Contents**

1. Evaluation and Treatment Planning: its presentation and documentation of Minimum two cases each in:
2. Upper Limb (including Hand Injury)
3. Lower Limb
4. Spine with/without Neurological condition.
5. Musculoskeletal condition of hand and foot.
6. Clinical discussions on different diagnosis and management
7. Evaluation of Sports injury cases and management

**BOOKS RECOMMENDED:**

1. Orthopedic Physical Therapy – Donatelli (4<sup>th</sup> edition)
2. Cash’s Text Book of Orthopaedics and Rheumatology for Physiotherapists – Jaypee Brothers (2<sup>nd</sup> edition)
3. Manual Mobilization of Extremity Joints – FredyKaltenborn, Maitland (8<sup>th</sup> edition)
4. Therapeutic Exercises – Kolby and Kisner (17<sup>th</sup> edition)
5. Therapeutic Exercises – O’Sullivan (6<sup>th</sup> edition)
6. Taping techniques – Rose Mac Donald
7. Neural Tissue Mobilization – Butler
8. Zulunga et al.: Sports Physiotherapy - W.B. Saunders
9. Brukner and Khan: Clinical Sports Medicine – Mac Graw Hill
10. Reed: Sports Injuries – Assessment and Rehabilitation – W.B. Saunders
11. Gould: Orthopedic Sports Physical Therapy – Mosby
12. C. Norris: Sports Injuries – Diagnosis and Management

Course Code	Subject	Title	Teaching Hours/ Week	
			L-T -P	Credits
BPT 600	Clinical Training	PC	0- 0- 4	2

**Course Assessment Methods (Internal: 100)**

The students shall undergo clinical training in recognised physiotherapy unit for a period not less than 2hrs/day and 5 days a week (Total 240 hrs.)O.P.D set ups under the supervision of Senior Physiotherapist. A Register/Log book shall be maintained by student to document the Evaluation/Functional Analysis and Functional Diagnosis Reports of minimum 5 cases per assignment and signature to be obtained from respective Section-in-charge at the end of each assignment for submission to the chairman.

**Course Outcomes**

<b>CO1.</b>	This course provides the student to develop initial patient contact skills and apply directed components of basic data collection and intervention techniques.
<b>CO2.</b>	Students will able to review the physical therapy documentation including the goals, and objectives; identifying major indications, contraindication, precautions and safety issues and identifying patient goals and outcomes in the documents
<b>CO3.</b>	Students will describe safe environments, appropriate risk management strategies, and emergency responses/support activities to take when the safety of self, patient or others is at risk in the clinical setting.
<b>CO4.</b>	Students will be able to describe communication processes within the clinical arena including referral process, patient delegation, review of records, between health care team members, and methods for reporting patient status.
<b>CO5.</b>	Students will engage in clinical training in hospital based medical and physiotherapy departments/ settings to enhance their clinical skills and apply contemporary knowledge gaining during teaching sessions.

## BACHELOR OF PHYSIOTHERAPY: FOURTH YEAR

### SEMESTER VII

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 471	Physiotherapy in Neurological Conditions – I	PC	5 – 0 – 0	5

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

#### **Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four Units). It will contain Seven Short Answer Type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the Four Units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four Units. All the questions including Q.No.1 shall carry equal marks. Each question carries 14 marks.

#### **Course Objectives & Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO 1	Understand Epidemiology, pathology, clinical presentation and medical, surgical and physiotherapy management of various disorders.
CO 2	Understand knowledge of normal neurodevelopment with specific reference to locomotion
CO 3	Assess, identify and analyze neuro motor and psychosomatic dysfunction in terms of alteration in the muscle tone, power, coordination, involuntary movements, sensations, perceptions etc.
CO 4	Correlate the assessment findings with provisional diagnosis and investigations such as EMG/NCV and arrive at Physical and functional diagnosis with clinical reasoning in various neuromuscular disorders

#### **Course Contents**

##### **Unit-I**

1. Examination of neurological disorder and principal of treatment.
2. Knowledge of various investigative procedures (invasive & non-invasive) used in the

diagnosis of various neurological disorders

3. Application of appropriate electrotherapeutic mode for relief of pain and functional re-education with clinical reasoning.

## **Unit –II**

1. Review of the examination & assessment of paediatric condition.
2. Review of pathological changes and principal of management of physiotherapy of following conditions (congenital and acquired disorders)
  - a. Cerebral palsy
  - b. Myopathies
  - c. Cervical Radiculopathy
  - d. Cervical Myelopathy

## **Unit –III**

1. Review of pathological changes and principle of management by physiotherapy of following Conditions:
  - a. Hemiplegia (includes – approaches – Bobath, Roods, etc.)
  - b. Diseases effecting extra pyramidal system (includes Parkinsonism, Wilson’s disease etc.)
  - c. Peripheral nerve and cranial nerve lesions
  - d. Neuritis
  - e. Myopathies
  - f. Bell’s palsy & facial palsy

## **Unit-IV**

1. Application of skill as PNF coordination & balancing exercise by using techniques based on neuro-physiological principles and tools of therapeutic gymnasium such as medicinal ball, tilt board etc.
2. Application for transfer & functional re-education exercise, postural exercise & gait training.
3. Prescription of appropriate orthotic devices and fabrication of temporary splints during urgent requirement with clinical reasoning

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
BPT 471 P	Physiotherapy in Neurological Conditions Practical – I	PC	0 – 0 – 4	2

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

**Course Objectives & Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO 1	Plan, prescribe and execute short term and long-term treatment to patients by various physiotherapeutic techniques/ modalities, including ergonomic advice and parent education in neuro pediatric cases.
CO 2	Acquire the skills of history taking & clinical examination of Pediatric neuro cases.

**Course Contents**

Evaluation and treatment planning its presentation and documentation of minimum 2 cases each in:

1. UMN lesion.
2. Paediatric neuro cases

**BOOKS RECOMMENDED:**

1. Cash textbook for Physiotherapist in Neurological disorders- J.P. Brothers Publication.2<sup>n</sup> Edition.
2. Textbook of Physical Rehabilitation - Susan O’sullivan, F.A. Davis.5<sup>th</sup> edition.
3. Proprioceptive Neuro Muscular Facilitation – Herman Kabet.3<sup>rd</sup> edition.
4. Practical Physical Therapy – Margaret Hollis.4<sup>th</sup> edition.
5. PNF in Practice - Alder &Aldea.4<sup>th</sup> edition
6. Therapeutic Exercise - O’ Sullivan.6<sup>th</sup> edition.

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
BPT 472	Physiotherapy in Medical Conditions – I	PC	5 – 0 – 0	5

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four Units). It will contain Seven Short Answer Type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the Four Units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four Units. All the questions including Q.No.1 shall carry equal marks. Each question carries 14 marks.

**Course Objectives & Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO 1	Understand the pathology and management of various disorders.
CO 2	Acquire the knowledge about the cardio respiratory system and the main techniques and methodologies to cope with the consequences of pathological events.
CO 3	Understand the fundamental concepts of cardio respiratory rehabilitation
CO 4	Acquire knowledge of the overview of patients care at the intensive care area, artificial ventilation, suctioning, positioning for bronchial hygiene and continuous monitoring of the patient at the intensive care area.

**Course Contents**

**Unit-I**

1. Review of pathological changes & principles of management by Physiotherapy of following conditions.

- a. Inflammation – acute, chronic
- b. Oedema
- c. Common conditions of skin – Acne, Psoriasis, Alopecia,
- d. Leucoderma, Leprosy, clubbing

- e. Deficiency disease – Rickets, Diabetes, Obesity, Osteoporosis and other vitamin deficiency disorders related to physiotherapy

## Unit –II

### 1. Review of intensive therapy:

- a. Intensive Therapy – Apparatus and clinical management
- b. Intensive Therapy – Physiotherapy management of the adult patient
- c. Pediatric and neonatal intensive therapy

## Unit -III

### 1. Techniques used in chest physiotherapy and mechanical aids as an adjunct to Physiotherapy:

- a. Breathing Exercise
- b. Postural Drainage
- c. Coughing and huffing techniques.
- d. Respiratory PNF
- e. Methods of using different types of inhalers and Nebulizers.

## Unit –IV

### 1. Review of normal functioning of respiratory and cardio vascular system:

- a. Review of anatomy and physiology of respiratory system including mechanism of respiratory system
- b. Review of anatomy and physiology of cardiovascular system

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
BPT 472 P	Physiotherapy in Medical Conditions Practical– I	PC	0 – 0 – 4	2

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

### **Course Objectives & Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO 1	Execute the effective physiotherapeutic measures (with appropriate clinical reasoning) with special emphasis to breathing retraining, nebulization, humidification, bronchial hygiene, general mobilization and exercise conditioning in general medical and surgical conditions
CO 2	Acquire the skills of history taking & clinical examination of various cardiopulmonary cases.

## **Course Contents**

1. History taking of the condition of the patient
2. Evaluation and assessment of medical and cardiopulmonary function of various disorders including auscultation and General Physical Examination
3. Clinical demonstration of physiotherapy techniques used in cardiopulmonary disorders
4. Knowledge of ICU equipment and orientation of ICU

### **BOOKS RECOMMENDED:**

1. Cash Textbook of general medical and surgical conditions for physiotherapists – Downie Jaypee Brothers.2<sup>nd</sup> edition.
2. Essentials of Cardiopulmonary physical therapy – Hillegass and Sadowsky – W.B. Saunders.3<sup>rd</sup> edition.
3. Cash Textbook of Chest, Heart and Vascular Disorder for Physiotherapists – Downie – J.P. Brothers.2<sup>nd</sup> edition.
4. The Brompton guide to chest Physical Therapy.5<sup>th</sup> edition.
5. Cardiopulmonary Physical Therapy – Irwin and Tecklin – Mosby.4<sup>th</sup> edition.
6. Cardiovascular/Respiratory Physiotherapy – Smith and Ball – Mosby.5<sup>th</sup> edition.
7. ACSM Guidelines for Exercise testing and Prescription – ACSM – Williams and Wilkins.6<sup>th</sup> edition.
8. Chest Physiotherapy in Intensive Care Unit – Mackenzie et al – Williams and Wilkins.2<sup>nd</sup> edition.
9. Cash Textbook of General Medical and Surgical Conditions for Physiotherapists – Downie – Jaypee Brothers.2<sup>nd</sup> edition.
10. Cash Textbook of Heart, Chest and Vascular Disorders for Physiotherapists – Downie – Jaypee Brothers.2<sup>nd</sup> edition.
11. Principles and practices of cardiopulmonary physical therapy – Frown Felter – Mosby.3<sup>rd</sup> edition.
12. Chest Physiotherapy in intensive care unit – Mackenzie – Williams and Wilkins. 2<sup>nd</sup> edition
13. Restoration of Motor functions in stroke patient: A Physiotherapist Approach – John stone – Churchill Livingstone.1<sup>st</sup> edition.

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
BPT 473	Physiotherapy in Surgical Conditions – I	PC	5– 0 – 0	5

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four Units). It will contain Seven Short Answer Type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the Four Units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four Units. All the questions including Q.No.1 shall carry equal marks. Each question carries 14 marks.

**Course Objectives & Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO 1	Identify, discuss and analyze various surgical conditions.
CO 2	Acquire knowledge of rationale of basic investigative approaches in the medical system and surgical intervention regimes related to cardio vascular and pulmonary impairment.
CO 3	Assess the various degrees of burns, plan and implement physiotherapy techniques for the rehabilitation of a burn and wound patient.

**Course Contents**

**Unit –I**

1. Review of Pathological changes and principle of Pre- and Post-operative management by Physiotherapy of the following conditions.

- a. Lobectomy, Pneumonectomy, Thoracotomy, Thoracoplasty, Endoscopy, eye hole surgeries.

## **Unit –II**

1. Review of Pathological changes and principle of Pre- and Post-operative management by  
Physiotherapy of the following conditions.

- a. Corrective surgeries of congenital heart defects, Angioplasty, open heart surgeries, heart transplant & blood vessel grafting
- b. Common organ transplant surgeries – liver & bone marrow etc.

## **Unit III**

1. Review of Pathological changes and principles of Pre- and Post-Operative management by  
Physiotherapy of the following condition:

- a. Wound, Ulcer, Pressure Sores.
- b. Burns and their complications

## **Unit –IV**

1. Review of Pathological changes and principle of Pre and Postoperative management by  
Physiotherapy of the following conditions.

- a. Common reconstructive surgical proceedings of the management of wounds, ulcers, burns and consequent contractures and deformities.

Course code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
BPT 473 P	Physiotherapy in Surgical Conditions Practical – I	PC	0– 0 – 4	2

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

**Course Objectives & Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO 1	Acquire the skill of evaluation and interpretation of functional capacity using simple exercise tolerance tests, symptom limited tests.
CO 2	Select strategies for cure, care and prevention to adopt restorative and rehabilitative measures for maximum possible functional independence of a patient at home, work place and in community.
CO 3	Acquire the skills of history taking & clinical examination of medical and surgical cases.

**Course Contents**

1. History taking of the condition of the patient
2. Assessment of medical and cardiopulmonary functions
3. Evaluation and treatment planning presentation and documentation of two cases each:
  - a. Thoracic surgical Condition.
  - b. Cardiac surgical Condition.

**BOOKS RECOMMENDED:**

1. Textbook of general medical and surgical conditions for physiotherapists - Downie Bros.2<sup>nd</sup>edition.
2. Essential of Cardiopulmonary physical therapy – Hillegass and Sadowsky – WB Saunders.3<sup>rd</sup> edition.
3. Text book of Chest, Heart and Vascular Disorders for Physiotherapists – Downie Bros.2<sup>nd</sup> edition.
4. Cardiopulmonary physical therapy – Irwin and Tecklin – Mosby.4<sup>th</sup> edition.
5. Vascular and respiratory physiotherapy – Smith and Ball – Mosby.5<sup>th</sup> edition.
6. Physiotherapy in Intensive Care Section – Mackenzie et al – Williams andWilkins.2<sup>nd</sup> edition.

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
BPT474	Research Methodology	PC	3-0-0	3

**Course assessment Method** (Internal: 30; External: 70) One minor test each of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four Units). It will contain Seven Short Answer Type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the Four Units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four Units. All the questions including Q.No.1 shall carry equal marks. Each question carries 14 marks.

**Course Objectives & Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO 1	Understand the importance of research basis in order to validate technique and technology in practice to physiotherapy.
CO 2	Understand the role and importance of research in the social sciences.
CO 3	Understand the issues and concepts salient to the research process.
CO 4	Understand the complex issues inherent in selecting a research problem, selecting an appropriate research design, and implementing a research project.
CO 5	Understand the concepts and procedures of sampling, data collection, analysis and reporting.

**Course Contents**

**Unit –I**

1. Introduction importance to research in clinical practice, scientific approach, characteristics, purposes and limitation.

**Unit –II**

1. Ethical issues and drafting in research, elements of informed consent
2. Structure of a research proposal

### **Unit –III**

1. Research question including literature review
2. Measurement: Principles of measurement, reliability and validity

### **Unit –IV**

1. Experimental sampling and design
2. Descriptive research

### **BOOKS RECOMMENDED:**

1. Research for Physiotherapist: Project Design and Analysis-Hicks-Churchill Livingstone, 5<sup>th</sup> edition.
2. Research Methodology: Methods & Techniques-C R Kothari & Gaurav Garg. 3<sup>rd</sup> edition

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
BPT 475	Organization and Physiotherapy Ethics	PC	3– 0 – 0	3

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four Units). It will contain Seven Short Answer Type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the Four Units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four Units. All the questions including Q.No.1 shall carry equal marks. Each question carries 14 marks.

**Course Objectives & Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO 1	Practice appropriate professional relationship in multidisciplinary set up patient management and co-partnership basis, practicing the concept of protection of right of the community.
CO 2	Understand the tools and techniques to be used in the performance of administrative job.
CO 3	Analyze and understand the environment of the organization.
CO 4	Understand the ethical principles of the profession.
CO 5	Understand the importance of record management and equipment handling.
CO 6	Understand about the planning and managing of an organization.

**Course Contents**

**Unit –I**

1. Physiotherapy Ethics:

- a. History of Physiotherapy
- b. Philosophy of Physiotherapy
- c. Major Ethical principles applied to moral issues in health care
- d. Rules of professional conduct and scope of practice
- e. Relationship with patient

- f. Confidentiality and responsibility
- g. Relationship with profession

## 2. Law:

- a. Legislative support for rehabilitation
- b. Describe the social security measure for protection from Occupational hazards, accidents, diseases
  - i. Outline of the Employees State Insurance Scheme and its various benefits
  - ii. Workman's Compensation Act
  - iii. American's with Disability Act
  - iv. People with Disability Act
  - v. Other financial benefits available for disabled.
- c. Laws and legal concepts
- d. Law protection from mal practice claim.
- e. Consumer Protection Act, Liability and Documentation
- f. Sale of Goods Act
- g. Professional and Government Licensing Accreditation and Educational Standards

## Unit –II

1. Plan assessment forms e.g. prevocational hand functions and higher functions for initial evaluation and progress recording.
2. Outline the writing of physiotherapy department annual reports, calculate monthly and annual statistics. Make plan for future requirements, e.g. consider staff patient ratio, equipment and staff requirement
3. Administration:
  - a. Basic principle of administration
  - b. Describe method of administration in a physiotherapy department: discussion on:
    - i. Maintenance of records, attendance, statistics, inventory stocks
    - ii. Details of administrative set up of rehabilitation Section
    - iii. Referrals – Purpose and type of referrals
  - c. Demonstrate administration of the following:
    - i. Storekeeping materials, inventory records, purchase ordering petty cash accounting
    - ii. General maintenance of equipment, furniture, Building costing of splints/aids/equipment/articles in physiotherapy
  - d. Describe and demonstrate:
    - i. Types of correspondence
    - ii. Methods of filling
  - e. Describe methods for care of equipment and materials
  - f. Discuss budgeting including items for annual budget, budget preparation and procurement.

### Unit -III

- 1 Plan to organize picnic or sports programme for patients.
- 2 Role of technology and manpower for rehabilitation
- 3 Organization & Management
  - a. Planning & organization
    - i. Planning cycle
    - ii. Principle of organizational chart, resources and quality management
    - iii. Planning
  - b. Financial issue including budget and income generation.
  - c. Hospital management.
    - i. Hospital organization
    - ii. Staffing
    - iii. Information
    - iv. Communication and coordination with physiotherapy.
    - v. Service of hospital
    - vi. Cost of service
    - vii. Monitoring and evaluation
  - d. Self-management.
    - i. Preparing for first job
    - ii. Time management
    - iii. Career development

### Unit –IV

1. Personnel management.
2. Profession of service and advertisement.
3. Discuss consideration for construction of a new department and modification of an old department including:
  - a. Space required.
  - b. Allotment of space e.g. suitability for access, plumbing requirements and circulation of air.

### BOOKS RECOMMENDED:

1. Physical rehabilitation – Assessment and treatment – Sullivan and Schrultz – FA. Davis.5<sup>th</sup> edition.
2. Park's Textbook of Preventive and social medicine - John Everett Park. 24<sup>th</sup> edition.
3. Lecture notes on rehabilitation medicine – Dr. S. Sunder – Jaypee Brothers.3<sup>rd</sup> edition.
4. Hand Splinting – Wiltons, W.B. Saunders.3<sup>rd</sup> edition.
5. Occupational Therapy and Physical dysfunction: Principles, Skills and Practice – Turner, Foster and Johnson – Churchill Livingstone.3<sup>rd</sup> edition.
6. Orthotics in Rehabilitation: Splinting the Hand and the Body – Mcree& Morgan – FA. Davis. Illustrated edition.
7. Atlas of Limb Prosthetics – American Academy of Orthopedic Surgeon – Mosby.2<sup>nd</sup> edition.
8. Atlas of Orthotics - American academy of Orthopedic Surgeon – Mosby.2<sup>nd</sup> edition.
9. Krusen's handbook of physical medicine and rehabilitation – Kottke& Lehmann – W.B. Saunders.4<sup>th</sup> edition.
10. Willard and Spackman's Occupational Therapy – Neistadt and Crepeau – Lippencot.9<sup>th</sup> edition.
11. Physical therapy management – An Integrated science – John walter.1<sup>st</sup> edition.

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
BPT 476	Physiotherapy in Community Health	PC	3– 0 – 0	3

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four Units). It will contain Seven Short Answer Type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the Four Units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four Units. All the questions including Q.No.1 shall carry equal marks. Each question carries 14 marks.

**Course Objectives & Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO 1	Describe the general concepts about Health, Disease & Physical fitness
CO 2	Describe the national policies for the rehabilitation of disabled- role of IAP to promote physiotherapy as a health delivery system.
CO 3	Describe the strategies to assess prevalence & incidence of various conditions responsible for increasing morbidity in the specific community, role of physiotherapy in reducing morbidity, expected clinical & functional recovery, reasons for non-compliance in specific community & environmental solution for the same.
CO 4	Describe the evaluation of disability & planning for prevention & rehabilitation.
CO 5	Describe the CBR in urban & rural set up, WHO policies, concept of team work, role of multi- purpose health worker.

## **Course Contents**

### **Unit-I**

1. General concept and determinants of health and diseases
  - a. National and International definition of health
  - b. Role of socio-economic and cultural environment in health and diseases
  - c. Epidemiology – definition and scope
  - d. Environmental hygiene – including man and his surroundings, occupational and industrial hygiene, village and town sanitation, bacteriology of water, milk and food hygiene
2. Principles of Community Based Rehabilitation:

Principle of a team work of medical person, PT, OT, Audiologist, speech therapists and vocational guide in a CBR Team

### **Unit-II**

1. Industrial Health – Environmental stress in the industrial area – accidents due to:
  - a. Physical agents e.g. heat/cold, light, noise, vibration, U.V. Radiation
  - b. Chemical agents – inhalation, local action, ingestion
  - c. Mechanical hazards – over use/fatigue injuries due to ergonomic alteration and ergonomic evaluation of work place, mechanical stresses as per hierarchy
    - i. Sedentary table work – executive, clerk
    - ii. Inappropriate sitting arrangement – vehicle drivers
    - iii. Constant standing – watchman, defence forces, surgeons
    - iv. Over-exertion in labours – common accidents, role of Physiotherapy, stress management
    - v. Psychological hazards – e.g. executives, monotonicity and dissatisfaction in job
    - vi. Occupational diseases and their hazards
2. Overview of public health administration – at central and state level strategy of health delivery system for “health for all” National Health Programme.

### **Unit-III**

1. Family planning – objective of National Family Planning Programmes, Family planning methods with a general idea of advantage and disadvantage of methods
2. Mental Health – socio-economic and cultural aspect

### **Unit-IV**

1. Communicable diseases – An overview (including prevention and control) of TB, HIV, Leprosy
2. Immunization Programmes – For children and hospital staff
3. Geriatrics – Role of physiotherapy in a home for the aged

### **BOOKS RECOMMENDED:**

1. Park’s Textbook of Preventive and Social Medicine – K. Park. 3<sup>rd</sup> edition.

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
<b>BPT 600</b>	<b>Clinical Training</b>	<b>PC</b>	<b>0– 0 – 4</b>	<b>2</b>

**Course Assessment Methods (Internal: 100)**

The students shall undergo clinical training in recognised physiotherapy unit for a period not less than 2hrs/day and 5 days a week (Total 240 hrs.)O.P.D set ups under the supervision of Senior Physiotherapist. A Register/Log book shall be maintained by student to document the Evaluation/Functional Analysis and Functional Diagnosis Reports of minimum 5 cases per assignment and signature to be obtained from respective Section-in-charge at the end of each assignment for submission to the chairman.

**Course Objectives & Course Outcomes**

<b>CO1.</b>	This course provides the student to develop initial patient contact skills and apply directed components of basic data collection and intervention techniques.
<b>CO2.</b>	Students will able to review the physical therapy documentation including the goals, and objectives; identifying major indications, contraindication, precautions and safety issues and identifying patient goals and outcomes in the documents
<b>CO3.</b>	Students will describe safe environments, appropriate risk management strategies, and emergency responses/support activities to take when the safety of self, patient or others is at risk in the clinical setting.
<b>CO4.</b>	Students will be able to describe communication processes within the clinical arena including referral process, patient delegation, review of records, between health care team members, and methods for reporting patient status.
<b>CO5.</b>	Students will engage in clinical training in hospital based medical and physiotherapy departments/ settings to enhance their clinical skills and apply contemporary knowledge gaining during teaching sessions.

## BACHELOR OF PHYSIOTHERAPY: FOURTH YEAR

### SEMESTER VIII

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 481	Physiotherapy in Neurological Conditions – II	PC	5 – 0 – 0	5

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

#### **Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four Units). It will contain Seven Short Answer Type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the Four Units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four Units. All the questions including Q.No.1 shall carry equal marks. Each question carries 14 marks.

#### **Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO1.	Understand anatomy, function, pathologies, assessment and treatment relating to the broad spectrum of clinical practice relating to neurological conditions.
CO2.	Demonstrate competency in performing and interpreting the neurological history and examination, i.e. the ability to recognize abnormal findings on the examination and put these together with the history to localize the lesion in the nervous system.
CO3.	Assess, formulate a differential diagnosis and propose initial evaluation and management for patients with common neurological disorders.
CO4.	Examine current approaches to neurological assessment.
CO5.	Investigate the latest treatment approaches in neurological rehabilitation.

## **Course contents**

### **Unit-I**

1. Review of pathological changes and principles of management by physiotherapy of the following conditions:
  - a. Paraplegia (includes spinal cord injury)
  - b. Common polyneuropathies conditions (includes Guillian Barre Syndrome, Diabetic poly neuropathy etc.)
  - c. Infection – includes poliomyelitis, meningitis, encephalitis, polyneuritis, Transverse myelitis, etc.)
  - d. Head injury (includes concussion, contusion, coma, etc.)
  - e. Disseminated sclerosis, amyotrophic lateral sclerosis, syringomyelia, motor neuron disease (MND)
  - f. Tabes dorsalis, Cerebellar ataxia.

### **Unit-II**

1. Review of pathological changes & principles of management of physiotherapy of the following conditions (congenital and acquired disorders).
  - a. Spina bifida
  - b. Spinal muscular atrophy
  - c. Wasting of small muscles of hand.

### **Unit –III**

1. Review of the examination, assessment and physiotherapy management of the geriatric conditions.

### **Unit –IV**

1. Functional training in Bladder and Bowel dysfunction.
2. Ergonomic advice for prevention/rehabilitation and patient care education about handling of paralytic patients.

Course Code	Subject	Title	Teaching Hours/ Week	
			L – T - P	Credits
BPT 481 P	Physiotherapy in Neurological Conditions Practical – II	PC	0 – 0 – 4	2

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

**Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO1.	Assess, formulate a differential diagnosis and propose initial evaluation and management for patients with common neurological disorders.
CO2.	Examine current approaches to neurological assessment and Learn the latest treatment intervention in neurological rehabilitation.

**Course contents**

Evaluation and treatment planning its presentation and documentation of minimum 2 cases each in:

1. LMN lesion
2. Geriatric Neuro cases
3. Pediatric Neuro Cases

**BOOKS RECOMMENDED:**

1. Cash textbook for Physiotherapist in Neurological disorders - J.P. Bros. Publication.2<sup>nd</sup> edition.
2. Textbook of Physical Rehabilitation - Susan O'sullivan- F.A. Davis.5<sup>th</sup> edition.
3. Proprioceptive Neuro Muscular Facilitation – Herman Kobet.3<sup>rd</sup> edition.
4. Practical Physical Therapy – Mergeret Hollis.4<sup>th</sup> edition.
5. PNF in Practice - Alder &Aldea.4<sup>th</sup> edition.
6. Therapeutic exercise by O'Sullivan.6<sup>th</sup> edition.

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
BPT 482	Physiotherapy in Medical Conditions – II	PC	5 – 0 – 0	5

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four Units). It will contain Seven Short Answer Type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the Four Units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four Units. All the questions including Q.No.1 shall carry equal marks. Each question carries 14 marks.

**Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO1.	Adopt physical therapy services by using theoretical and practical knowledge with consideration for patient in clinical judgment.
CO2.	Develop physiotherapy skills in diagnosing different conditions by assessing, planning and rehabilitating patient and further follow up evaluation for patients with common cardiopulmonary disorders.
CO3.	Review of pathological changes and principle of management by physiotherapy of the cardiopulmonary conditions.
CO4.	Examine current approaches to cardiopulmonary assessment.
CO5.	Investigate the latest treatment approaches in medical rehabilitation.

**Course contents**

**Unit-I**

1. Knowledge of various investigative procedures (invasive and non-invasive) used in the diagnosis of various respiratory disorders.

## Unit –II

1. Review of pathological changes and principle of management by physiotherapy of the following conditions: Bronchitis, Asthma, Lung abscess, Bronchiectasis, Emphysema, COPD, Empyema, pneumonia, Chest wall deformities, Tumours of bronchi and lung tissue.

## Unit-III

1. Knowledge of various investigative procedures (invasive and non-invasive) used in the diagnosis of various cardiovascular disorders.

## Unit-IV

1. Review of pathological changes and principle of management by physiotherapy of the following conditions: Thrombosis, Embolism, Buerger's diseases, Arteriosclerosis, Thrombophlebitis, Phlebitis, Gangrene, Congestive Cardiac failure, Hypertension, Hypotension and Aneurysm.

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
BPT 482 P	Physiotherapy in Medical Conditions Practical – II	PC	0 – 0 – 4	2

**Course assessment Method** (Internal: 30; External: 70) One minor test each of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

### **Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO1.	Understand of principle the physiotherapy management in disorders of Cardiopulmonary system and the application of principles of specific disorders.
CO2.	Acquire the knowledge through lecture, case presentation, general discussion and class discussion and setup a treatment program tailor to the patients' needs

### **Course contents**

1. Knowledge of diagnostic and clinical tests of various diseases.
2. Case Presentations.
3. Physiotherapy management of various diseases.

## **BOOKS RECOMMENDED:**

1. Cash Textbook of general medical and surgical conditions for physiotherapists – Downie Jaypee Brothers.2<sup>nd</sup> edition.
2. Essentials of Cardiopulmonary physical therapy – Hillegass and Sadowsky – WB. Saunders.3<sup>rd</sup> edition.
3. Cash Textbook of Chest, Heart and Vascular Disorder for Physiotherapists – Downie – JP. Brothers.2<sup>nd</sup> edition.
4. The Brompton guide to chest Physical Therapy.5<sup>th</sup> edition.
5. Cardiopulmonary Physical Therapy – Irwin and Tecklin – Mosby.4<sup>th</sup> edition.
6. Cardiovascular/Respiratory Physiotherapy – Smith and Ball – Mosby.5<sup>th</sup> edition.
7. ACSM Guidelines for Exercise testing and Prescription – ACSM – Williams and Wilkins.6<sup>th</sup> edition.
8. Chest Physiotherapy in Intensive Care Unit – Mackenzie et al – Williams and Wilkins.2<sup>nd</sup> edition.
9. Cash Textbook of General Medical and Surgical Conditions for Physiotherapists – Downie – Jaypee Brothers.2<sup>nd</sup> edition.
10. Cash Textbook of Heart, Chest and Vascular Disorders for Physiotherapists – Downie – Jaypee Brothers.2<sup>nd</sup> edition.
11. Principles and practices of cardiopulmonary physical therapy – Frown Felter – Mosby.3<sup>rd</sup> edition.
12. Chest Physiotherapy in intensive care unit – Mackenzie – Williams and Wilkins. 2<sup>nd</sup> edition.
13. Restoration of Motor functions in stroke patient: A Physiotherapist Approach – John stone – Churchill Livingstone.1<sup>st</sup> edition.

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
BPT 483	Physiotherapy in Surgical Conditions – II	PC	5 – 0 – 0	5

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four Units). It will contain Seven Short Answer Type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the Four Units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four Units. All the questions including Q.No.1 shall carry equal marks. Each question carries 14 marks.

**Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO1.	Understanding of common surgical incisions and principle of pre- and post-operative management by Physiotherapy of the common abdominal surgeries.
CO2.	Understanding of common surgical incisions and principle of pre- and post-operative management of Physiotherapy after brain & spinal cord surgeries.
CO3.	Understanding of prenatal and postnatal rehabilitation.
CO4.	Examine current approaches to assessment.
CO5.	Investigate the latest treatment approaches of physiotherapy rehabilitation.

**Course contents**

**Unit-I**

1. Review of Pathological changes and principle of Pre- and Post-operative management by Physiotherapy of the following conditions:
  - a. Common abdominal surgeries, including GIT, liver, Spleen, Kidney, bladder, etc.

**Unit –II**

1. Review of Pathological changes and principles of pre- and post-operative management by Physiotherapy of the follow conditions:
  - a. Common operation of reproduction system including surgical intervention for child delivery, Antenatal and post-natal Physiotherapy
  - b. Common operation of the ear, nose, throat and jaw as related to Physiotherapy.

### Unit –III

1. Review of Pathological changes and principles of pre and post-operative management by Physiotherapy of the follow conditions:
  - a. Common surgeries of the cranium and brain.
  - b. Common surgeries of vertebral column and spinal cord.

### Unit-IV

1. Review of Pathological changes and principles of pre- and post-operative management by Physiotherapy of the follow conditions:
  - a. Common surgeries of Peripheral nerves.
  - b. Surgical Interventions in Traumatic head injuries

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
BPT 483 P	Physiotherapy in Surgical Conditions Practical – II	PC	0 – 0 – 4	2

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

### Course Outcomes

Sr. No	At the end of the semester, the student will be able to:
CO1.	This course provides the student to give a deeper assessment approaches (investigation, test and diagnosis).
CO2.	Understanding of incision and principle of pre- and post-operative physiotherapy management.

### Course contents

1. Clinical diagnosis of the presentations.
2. Investigations and tests of different clinical presentations.
3. Physiotherapy management of the various diseases and surgical conditions

### **BOOKS RECOMMENDED:**

1. Textbook of general medical and surgical conditions for physiotherapists – Downie Bros.2<sup>nd</sup> edition.
2. Essential of Cardiopulmonary Physical Therapy – Hillegass and Sadowsky – WB. Saunders.3<sup>rd</sup> edition.
3. Textbook of Chest, Heart and Vascular Disorders for physiotherapists – Downie – Bros.2<sup>nd</sup> edition.
4. Cardiopulmonary Physical Therapy – Irwin and Tecklin – Mosby.4<sup>th</sup> edition.
5. Vascular and Respiratory Physiotherapy – Smith and Ball – Mosby.5<sup>th</sup> edition.
6. Physiotherapy in Intensive Care Unit – Mackenzie et al – Williams and Wilkins.2<sup>nd</sup> edition.

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
BPT 484	Biostatistics	PC	3– 0 – 0	3

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four Units). It will contain Seven Short Answer Type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the Four Units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four Units. All the questions including Q.No.1 shall carry equal marks. Each question carries 14 marks.

**Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO1.	Understand the statistical measures used analysis and interpretation of research data.
CO2.	Able to apply the information on research design and their implementation.
CO3.	Identify to read critique research articles and understand and apply the principles of research to perform a guided research.
CO4.	Recognize the importance of data collection and its role in determining scope of inference; Demonstrate a solid understanding of interval estimation and hypothesis testing
CO5.	Analyze and undertake data for research purpose and its documentation for long life learning in physiotherapy.

**Course contents**

**Unit –I**

1. Meaning and Purpose of Statistics
  - a. Definition, scope and limitations
2. Descriptive statistics
  - a. Measure of Central Tendency, Measure of Dispersion, Skewness, Kurtosis and Probability

## **Unit –II**

1. Theoretical Distributions
  - a. Binomial, Poisson and normal distribution with its application, mean and variance
2. Test of Significance
  - a. Chi-square test, Z-Test, T-Test and F-Test etc. with their application

## **Unit –III**

1. Design and Sampling Survey
  - a. One-way ANOVA, Two-way ANOVA, Basic Principles of design, Analysis of variance: CRD and RBD, concept of sample survey, its advantages and Basic sampling techniques
2. Multiple comparisons
  - a. Comparison between pairs of means, comparison between groups of means, Trend comparisons and Mean comparison for factorial treatments

## **Unit –IV**

1. Non-parametric statistics
  - a. Sign test, run test, median test, Mann Whitney test and Wilcoxon test
2. Regression and Correlation
  - a. Equation of the regression plan Y and X and X on Y, Least Square Method, Karl Pearson's Correlation Coefficient and Spearman's Rank Correlation etc.

## **BOOKS RECOMMENDED:**

1. Methods in Biostatistics – Mahajan JP, 8<sup>th</sup> edition.
2. Statistics in Medicine-Colton, Little Brown & co publisher,6<sup>th</sup> edition.
3. Research for Physiotherapist: Project Design and Analysis-Hicks-Churchill Livingstone, 5th edition.
4. Biostatistics: The manual for Statistical methods for use in health and nutrition – KV Rao JP,2<sup>nd</sup> edition.
5. Research methods in Behavioural Sciences -Mohsin -Orient Publication. Illustrated edition.
6. Statistics for Health Professionals – William C. Scheffler.2<sup>nd</sup> edition.
7. Introduction to Biostatistics and research methods: A manual for students – Rao -PPS Sundar, 5th edition.
8. Teaching Health Statistics – L Wanga SK, 2nd edition.

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
BPT 485	Rehabilitation Medicine including Orthotics and Prosthetics	PC	3– 0 – 0	3

**Course assessment Method** (Internal: 30; External: 70) One minor test of 20 marks, class performance measured through percentage of lecture attended (4 marks), assignments, quiz etc. (6 marks) and end semester examination of 70 marks.

**Instructions for Paper Setters**

Nine questions are to be set by the examiner. Question no.1 will be compulsory and based on the entire syllabus (all the four Units). It will contain Seven Short Answer Type questions, each of two marks. Rests of the eight questions are to be given by setting two questions from each of the Four Units of the syllabus. A candidate is required to attempt other four questions by selecting one from each of the four Units. All the questions including Q.No.1 shall carry equal marks. Each question carries 14 marks.

**Course Outcomes**

Sr. No	At the end of the semester, the student will be able to:
CO1.	Identify and address the issues related to the organization and administration of the physiotherapy department. Learn basic principle of CBR.
CO2.	Develop physiotherapy skills in diagnosing different conditions by assessing, planning and rehabilitating patient and further follow up evaluation. Analyze and undertake data for research purpose and its documentation for long life learning in physiotherapy
CO3.	Apply the skills for marketing physiotherapy profession and its promotion, understanding the functioning of various organization like IAP, WCPT & WHO
CO4.	Apply principles and professional ethics and responsibilities in physiotherapy practice
CO5.	Develop educational experience for proficiency in profession and promote preventive and rehabilitative act on the society.

## **Course contents**

### **Unit –I**

1. Conceptual framework of rehabilitation, definitions and various models of rehabilitation.
2. Physical restorative services.
3. Education of person with disabilities.
4. Vocational Rehabilitation.
5. Community Based Rehabilitation & out-reach programs to rehabilitate persons with disabilities living in rural area.
  - a. Define community based and institution-based rehabilitation.
  - b. Describe the advantage and disadvantages of institution and community-based rehabilitation.
6. Role of the voluntary sector in rehabilitation of the persons with disabilities.
7. Strategies for awareness, public education and information.
8. List the principles of health education, role of health education in rehabilitation services and methods of communication.
9. Outline selected National Health Programs.

### **Unit -II**

1. Constitution and functions of Indian Association of Physical Therapy (IAP).
2. Functioning of the World Confederation of Physical Therapy (WCPT) and its various branches – special interest groups (brief) and the role of WCPT.
3. Role of World Health Organization.

### **Unit –III**

1. Principles of Orthotics – types, indications, contra-indications, assessment (check out), uses and fitting region wise.
2. Fabrication of simple splints and self-help devices for upper and lower extremity – indications and applications.
3. Principles of Prosthetics – types, indications, contra-indications, assessment (check out), uses and fitting – upper and lower extremity

### **Unit -IV**

1. Definitions, Biomechanical Principles, Designing, Fabrication, Use, check-ups, Maintenance, Indications:-
  - a. Walking Aids and crutches (all types)
  - b. Wheel Chairs

- c. Splints
- d. Spinal Supports, Collars, Belts Frames and Braces
- e. Orthotic appliances: Below knee & elbow and above knee & elbow
- f. Prosthesis: Below knee & elbow and above knee & elbow
- g. Adaptive devices

**BOOKS RECOMMENDED:**

1. Atlas of Orthotic & Prosthetics-4<sup>th</sup> edition
2. Normal Human Locomotion, ALIMCO
3. Text book of rehabilitation- S. Sunder,3<sup>rd</sup> edition

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
<b>BPT 600</b>	<b>Clinical Training</b>	<b>PC</b>	<b>0– 0 – 4</b>	<b>2</b>

**Course Assessment Methods (Internal: 100)**

The students shall undergo clinical training in recognised physiotherapy unit for a period not less than 2hrs/day and 5 days a week (Total 240 hrs.)O.P.D set ups under the supervision of Senior Physiotherapist. A Register/Log book shall be maintained by student to document the Evaluation/Functional Analysis and Functional Diagnosis Reports of minimum 5 cases per assignment and signature to be obtained from respective Section-in-charge at the end of each assignment for submission to the chairman.

**Course Outcomes**

<b>CO1.</b>	This course provides the student to develop initial patient contact skills and apply directed components of basic data collection and intervention techniques.
<b>CO2.</b>	Students will able to review the physical therapy documentation including the goals, and objectives; identifying major indications, contraindication, precautions and safety issues and identifying patient goals and outcomes in the documents
<b>CO3.</b>	Students will describe safe environments, appropriate risk management strategies, and emergency responses/support activities to take when the safety of self, patient or others is at risk in the clinical setting.
<b>CO4.</b>	Students will be able to describe communication processes within the clinical arena including referral process, patient delegation, review of records, between health care team members, and methods for reporting patient status.
<b>CO5.</b>	Students will engage in clinical training in hospital based medical and physiotherapy departments/ settings to enhance their clinical skills and apply contemporary knowledge gaining during teaching sessions.

Course Code	Subject	Title	Teaching Hours /Week	
			L – T – P	Credits
<b>BPT 601</b>	<b>Project Work</b>	<b>PC</b>	<b>0– 0 – 4</b>	<b>2</b>

**Course Assessment Methods (External: 100)**

*As part of their requirement for the Bachelor Degree the student is required to undertake a research study under the guidance of Guide/supervisor. Students have to undergo a project viva-voice by examining committee.*

**Course Outcomes**

<b>CO1.</b>	This course provides the student to plan and engage in an independent and sustained critical investigation and evaluation of a chosen research topic to generate new knowledge in an area of physiotherapy research.
<b>CO2.</b>	Use of newer physiotherapy techniques and their application
<b>CO3.</b>	Demonstrate advanced ability to review, evaluate and use relevant information critically and discuss new facts and phenomena
<b>CO4.</b>	Student should deepen understanding of the research process develop a scientific attitude vis-à-vis the medical knowledge and establish a basis for further research project.
<b>CO5.</b>	Able to consider ethical aspects on scientific projects and development.

## BACHELOR OF PHYSIOTHERAPY: FOURTH YEAR

### SIX MONTH COMPULSORY INTERNSHIP

S. No.	Subject	Teaching Hours/Week	
		Hours	Credits
1	Rotatory Internship	Minimum 24 hrs/Week	Qualifying

Student has to submit Rotatory internship completion certificate from hospital/institution of repute. It should certify that candidate has completed six months rotatory internship in following departments Musculo-Skeletal, Neuro-Sciences, Cardio-Respiratory, Intensive Care, Gynaecology & Obstetrics/ Community Health.

#### Course Outcomes

<b>CO1.</b>	This course provides the student to develop interviewing skills to elicit an accurate and thorough history addressing the onset and persistence of illness in the context of the patient's life.
<b>CO2.</b>	Able to perform a detailed and accurate physical examination.
<b>CO3.</b>	Able to choose appropriate diagnostic, management, and therapeutic interventions based on sound reasoning using all the tools of evidence-based medicine.
<b>CO4.</b>	Develop interpersonal and communication skills with both members of the healthcare team as well as with patients and families.
<b>CO5.</b>	Seek to provide high-quality care that is evidence-based, cost-effective and individualized to each patient and emphasizes patient safety.