BACHOLOR OF PHYSIOTHERAPY

Program Outcome: At the end of the four and a half years BPT programme, the candidate shall be able to-		
Sr No	**Name of Program**	**Program Outcome**
1	PO1	Demonstrate effective communication and interpersonal skills, which are adapted to meet the needs of diverse individuals and groups.
2	PO2	Apply principles of critical thinking and clinical reasoning to evidence-based physiotherapy practice and be able to demonstrate comprehensive knowledge of physiotherapy.
3	PO3	Understand Patho-physiological, & Psychosomatic impairments resulting in Dysfunction of movement of all ages, & occupations; as well as epidemiological sectors in the population; & arrive at the appropriate Physical & Functional diagnosis.
4	PO4	Understand the rationale & basic investigative approach of the medical & surgicalsystem, and plan & implement specific Physiotherapeutic measures effectively.
5	PO5	Select strategies for management & care; adopt preventive, restorative & Rehabilitative measures for maximum possible independence of a client/ patient, at home, workplace & in the community.
6	PO6	Develop skills to be able to implement, Cardio Pulmonary resuscitation and first-aid, providing support to the injured area, splinting etc.
7	PO7	Demonstrate skills to promote Health in general, in sports, work productivity, Geriatric & Women's health, etc. keeping in view of National and State-level Health policies.
8	PO8	Develop collaboration skills to function as one of the members of a multidisciplinary health team.
9	PO9	Develop skills to prescribe home exercise programs & compliance to follow ergonomic advice given as a preventive/adoptive measure.
10	PO10	Demonstrate the skill of administrative work along with managing a varied caseload of In and Outpatients Department, for the purpose of patient's evaluation, assessment, diagnostic procedures; & treatment; and use of appropriate skills like manipulation, mobilization methods, Neuro-physiotherapeutic maneuvers, techniques of Bronchial hygiene, breathing retraining; application of Electrotherapeutic modalities and Therapeutic exercises.
11	PO11	Develop ability to prescribe, assess (fitting) & use of appropriate orthotic & prosthetic devices; in addition to an ability to fabricate simple splints for extremities, for the purpose of prevention, support & training for ambulation & activities of daily living.
12	PO12	Capability to solve problems by using research-based knowledge and research methods and can set short-term and long-term goals for rehabilitation; further practice professional autonomy & ethical principle with referral as well as first contact client in conformity with the ethical code for Physiotherapists.

CLASSIFICATION OF COURSES IN BPT DEGREE PROGRAM: 2020 BATCH

Sem.	Foundation courses	Core courses	Allied courses	Skill Enhancement courses
I	• HumanAnatomy- I • Human Physiology -I • Exercise Therapy -I		• Psychology • Environmental Studies	• Computer Application • Linguistic Proficiency
II	• Human Anatomy -II • HumanPhysiology-II • Exercise Therapy -II		• Sociology • Biomedical Physics • First Aid and Basic Life Support	• Global Communication Skills
III	• Exercise Therapy- III • ElectroTherapy- I		• Biochemistry • Pharmacology • Pathology • Microbiology	• IPDC-1 • Foreign Language (French)
IV	• Exercise Therapy- IV • ElectroTherapy- II	• Gen. Medicine (including Cardiothoracic Conditions) • Clinical Orthopaedics &Traumatology	• Psychiatry	• IPDC-II • Foreign Language (French)
V	• Musculoskeletal Physiotherapy-I • Biomechanics and Kinesiology	• Neurology • Paediatrics • General Surgical Conditions	• Applied Radiology	• Professional Communication and Soft Skills • Foreign Language (French)

VI	• Musculoskeletal Physiotherapy-II • Physiotherapy in Neurology-I • Bioengineering and Ergonomics • Physical Diagnosis & Therapeutic Skills			• Professional Readiness
VII	• PT in Cardio-Respiratory conditions • Physiotherapy in Neurology-II • Sports Physiotherapy		• Research Methodology and Biostatistics	• Creativity, Problem Solving and Innovation
VIII	• PT in General Medical & Surgical Conditions • Preventive and Community Physiotherapy	• Evidence Based Practice	• Health Care Management and Administration • Allied and Complementary Therapies	• Research Project

- From BPT Third to Eighth Semester students have to undergo compulsory Clinical Training in associated Hospitals of the University followed by Six months rotatory clinical internship.

SEMESTER I

Sem	Course Code	Course Title	Teaching Scheme				Examination Scheme				
			Contact Hours			Credit	Theory		Practical		Total
			Theory	Practical	Total		CE	ESE	CE	ESE	
	BPT101	HUMAN ANATOMY-I	04	00	04	04	30	70	-	-	100
	BPT102	HUMAN PHYSIOLOGY-I	04	00	04	04	30	70	-	-	100
	BPT1030	EXERCISE THERAPY-I	04	00	04	04	30	70	-	-	100
	BPT104	PSYCHOLOGY	04	00	04	04	30	70	-	-	100
	BPT 105	COMPUTER APPLICATION	02	00	02	02	20	30	-	-	50
	BPT106	LINGUISTIC PROFICIENCY	02	00	02	02	20	30	-	-	50
	BPT107	HUMAN ANATOMY-I LAB	00	04	04	04	-	-	30	70	100
	BPT108	HUMAN PHYSIOLOGY-I LAB	00	04	04	04	-	-	30	70	100
	BPT109	EXERCISE THERAPY-I LAB	00	04	04	04	-	-	30	70	100
	BPT110	COMPUTER APPLICATION	00	02	02	02	-	-	20	30	50
				Total	**34**	**34**					**850**

SEMESTER II

	Course Code	Course Title	Teaching Scheme				Examination Scheme				
			Contact Hours			Credit	Theory		Practical		Total
			Theory	Practical	Total		CE	ESE	CE	ESE	
	BPT201	HUMAN ANATOMY-II	04		04	04	30	70			100
	BPT202	HUMAN PHYSIOLOGY-II	04		04	04	30	70			100
	BPT203	EXERCISETHERAPY-II	04		04	04	30	70			100
	BPT204	SOCIOLOGY	02	-	02	02	20	30	-	-	50
	BPT205	BIOMEDICAL PHYSICS	04	-	04	04	30	70	-	-	100
	BPT206	FIRST AID AND BASIC LIFE SUPPORT	02	-	02	02	20	30	-	-	50
	BPT207	GLOBAL COMMUNICATION SKILLS	02	0	02	02	20	30	-	-	50
	BPT208	HUMAN ANATOMY-II	00	04	04	04			30	70	100
	BPT209	HUMAN PHYSIOLOGY-II	00	04	04	04			30	70	100
	BPT210	EXERCISETHERAPY-II	00	04	04	04			30	70	100
				Total	**34**	**34**					**850**

SEMESTER III

	Course Code	Course Title	Teaching Scheme				Examination Scheme				
			Contact Hours			Credit	Theory		Practical		Total
			Theory	Practical	Total		CE	ESE	CE	ESE	
	BPT301	EXERCISE THERAPY-III	04		04	04	30	70			100
	BPT302	ELECTROTHRAPY –I	04		04	04	30	70			100
	BPT303	BIOCHEMISTRY	04		04	04	30	70			100
	BPT304	PHARMACOLOGY	02	-	02	02	20	30	-	-	50
	BPT305	PATHOLOGY	04	-	04	04	30	70	-	-	100
	BPT306	MICROBIOLOGY	02	-	02	02	20	30	-	-	50
	BPT307	CLINICAL TRAINING	00	02	02	02	20	30	-	-	50
	BPT308	EXERCISE THERAPY-III	00	04	04	04			30	70	100
	BPT309	ELECTROTHRAPY –I	00	04	04	04			30	70	100
	BPT310	COMMUNICATION SKILL-I	00	02	02	02	20	30	-	-	50
	BPT311	ENVIRONMENTAL SCIENCE	02	00	02	02	20	30			50
				Total	**34**	**34**					**850**

SEMESTER IV

	Course Code	Course Title	Teaching Scheme				Examination Scheme				
			Contact Hours			Credit	Theory		Practical		Total
			Theory	Practical	Total		CE	ESE	CE	ESE	
	BPT401	EXERCISE THERAPY-IV	04		04	04	30	70			100
	BPT402	ELECTROTHRAPY –II	04		04	04	30	70			100
	BPT403	GENERAL MEDICINE INCLUDING CARDIO-THORACIC CONDITIONS	04		04	04	30	70			100
	BPT404	PSYCHIATRY	02	-	02	02	20	30	-	-	50
	BPT405	CLINICAL ORTHOPAEDICS & TRAUMATOLOGY	04	-	04	04	30	70	-	-	100
	BPT406	CLINICAL TRAINING	02	-	02	02	20	30	-	-	50
	BPT407	EXERCISE THERAPY-IV	00	02	02	02	20	30	-	-	50
	BPT408	ELECTROTHRAPY –II	00	04	04	04			30	70	100
	BPT409	CLINICAL TRAINING	00	04	04	04			30	70	100
	BPT10		00	02	02	02			50		50
	BPT411		02	00	02	02	20	30			50
				Total	**34**	**34**					**850**

.

Course Code: BPT101

Course Name: HUMAN ANATOMY-I

Prerequisite Course/s: Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
04	00	04	04	30	70	00	00	100	

CE: Continuous Evaluation, ESE: End Semester Exam

It is designed to provide students with a working knowledge of the structure of the human body which is an essential foundation for their clinical studies. Studies are concerned with the topographical and functional anatomy of the limb. Particular attention is paid with reference to topics of importance to physiotherapy.

Course Description:

Course Learning Outcomes: The student will be able to	
CO 1	Understand and analyzed the necessity of studying anatomy and its possible requirement in future for diagnosing and treating various clinical conditions in physiotherapy practice.
CO 2	Identify and describe the fundamentals of structure anatomy by illustrating diagrams on their body parts or charts.
CO 3	Understand the fundamentals of histology and embryology of the human body.
CO 4	Identify the functions of bones, joints and muscles along with their origin and insertion.

CO 5	Describe the basic terminologies of osteology, histology, general embryology and other basic terms specific to human body.
CO 6	Distinguish and describe the upper extremity and lower extremity components, parts and muscle, connecting tissues of the human body.

Course Content:

Section I			
Module	Content	Hours	Weightage in %
1.	**UPPER EXTREMITY**: 1. Osteology: Clavicles, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges. 2. Soft parts: Breast, pectoral region, axilla, front of arm, back of arm, cubital fossa, front of fore arm, back of fore arm, palm, dorsum of hand, muscles, nerves, blood vessels and lymphatic drainage of upper extremity. 3. Joints: Shoulder girdle, shoulder joint, elbow joints, radio ulnar joint, wrist joint and joints of the hand. 4. Arches of hand, skin of the palm and dorsum of hand	20	22
2.	**HISTOLOGY** General Histology, study of the basic tissues of the body; Microscope, Cell, Epithelium, Connective Tissue, Cartilage, Bone, Muscular tissue, Nerve Tissue – TS & LS, Circulatory system – large sized artery, medium sized artery, large sized vein, lymphoid tissue, Skin and its appendages.	05	6
3.	**EMBRYOLOGY** a) Ovum, Spermatozoa, fertilization and formation of the Germ layers and their derivations. b) Development of skin, Fascia, blood vessels, lymphatic, c) Development of bones, axial and appendicular skeleton and muscles, d) Neural tube, brain vessels and spinal cord, e) Development of brain and brain stem structures	05	6
4.	**MUSCULOSKELETAL ANATOMY** a) ***Anatomical positions***: Of body, axes, planes, common anatomical terminologies (Groove, tuberosity, trochanters etc) b) **Connective tissue**: Classification. c) ***Bones***: - Composition & functions, classification and types according to morphology and development. d) ***Joints***:-Definition-classification, structure of fibrous, cartilaginous joints, blood supply and nerve supply of joints. e) ***Muscles***: –Origin, insertion, nerve supply and actions f) **Lower Extremity**: 1. Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges. 2. Soft parts: Gluteal region, front and back of the thigh (Femoral triangle, femoral canal and inguinal canal), medial side of the thigh (Adductor canal), lateral side of the thigh, popliteal fossa, anterior and posterior compartment of leg, sole of the foot, lymphatic drainage of lower limb, venous drainage of the lower limb, nerve & arterial supply of the lower limb, arches of foot, skin of foot. 3. Joints: Hip Joint, Knee joint, Ankle joint, joints of the foot.	40	45
5.	**APPLIED ANATOMY** Based on Nervous & musculoskeletal system	20	21

Text Book:

Title	Author/s	Publication
Human Anatomy – Regional And Applied; Volume I, Volume II and Volume III.	B.D Chaurasia's	CBS Publishers

Reference Book:

Title	Author/s	Publication
Clinical Anatomy for Medical students	Richard Snell	Little Brown and Company Boston
Human Osteology.	InderbirSingh	JP Brothers
Essentials of Anatomy	InderbirSingh	JP Brothers
Gray's Anatomy	Henry Gray	Churchill Livingstone.
Principles of Anatomy & Physiology:	TORTORA	Harper & Row pub.
McMinn's color atlas of Human Anatomy	McMinn	Edinburgh : Mosby Elsevier
Cunningham manual of practical anatomy: Vol I, II, III	D. J. Cunningham; G J Romanes	Oxford University Press

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with cadaver dissection.

Course Evaluation:

Theory:

- Continuous Evaluation Consist of One Test of 20 Marks and submission of assignment which carries 10 Marks
- End Semester Examination will consist of 70 Marks Exam.

Course Code: BPT102

Course Name: HUMAN PHYSIOLOGY-I

Prerequisite Course/s: Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
04	0	04	04	30	70			100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Learning Outcomes: The student will be able to	
CO 1	Understand the fundamentals General Physiology like Cell structure and functions in the human body.
CO 2	Discuss basic cell biology, blood and how it relates to fundamental physiological principles and systems.
CO 3	Learn the normal functioning of all the organ systems like Nervous system, Cardiovascular system, Renal system, Respiratory system and their interaction for well-coordinated total body functions.
CO 4	Describe and explain the physiology and functions of Nerve and Muscle, its interactions in human body. Explain Resting membrane potential, Action potential and types of muscle.
CO 5	Distinguish and explain the physiology and functions of cardiovascular system and respiratory system. Describe the conducting system, cardiac output, blood pressure, shock and regional circulation.
CO 6	Explain the physiology and functions of Respiratory system in depth with description of mechanics of breathing, spirometry, transportation of gases, pulmonary circulation and neural regulations and applied physiology of it.
CO 7	Explain and understand the physiology of function and structure of renal system.

Course Content:

Section I			
Module	Content	Hours	Weightage in %
1.	**GENERAL PHYSIOLOGY** Cell: Morphology. Organelles: their structure and functions, Transport Mechanisms across the cell membrane, Body fluids: Distribution, composition. Tissue fluid – formation.	05	8
2.	**BLOOD** a) Introduction: Composition and functions of blood. b) Plasma: Composition, formation, functions. Plasma proteins. c) RBC: structure formation, functions, count and its variations. Erythropoiesis- stages, factors regulating. Reticulo-endothelial system (in brief) Haemoglobin - Anemia (in detail), types of Jaundice. Blood indices, PCV, ESR. d) WBC: Classification. Morphology, functions, count, its variation of each. Immunity: Innate and acquired. e) Platelets: Morphology, functions, count, its variations f) Haemostatic mechanisms: Blood coagulation–factors, mechanisms. Their disorders. Anticoagulants. g) Blood Groups: Landsteiner's law. Types, significance, determination, Erythroblastosisfoetalis. h) Blood Transfusion: Cross matching. Indications and complications. i) Lymph: Circulation and functions.	10	17
3.	**NERVE MUSCLE PHYSIOLOGY** a) Introduction: Resting membrane potential. Action potential – ionic basis and properties. b) Nerve: Structure and functions of neurons. Classification, Properties and impulse transmission of nerve fibers. Nerve injury – degeneration and regeneration. c) Muscle: Classification. Skeletal muscle: Structure. Neuromuscular junction: Structure. Neuromuscular transmission. Excitation- Contraction coupling. Rigor mortis. Motor unit. Properties of skeletal muscles, Length- tension relationship, fatigue, load. d) Smooth muscle: Structure, types, mechanism of contraction	14	24
4	**RENAL SYSTEM** a) Introduction: Functional anatomy of kidney, Nephrons, juxtamedullary. Juxta- glomerular apparatus. Renal blood flow and its regulation. b) Mechanism of Urine Formation: Mechanism of glomerular filtration. GFR – normal value and factors affecting. Insulin clearance. Creatinine clearance. Diuretics, dieresis. c) Tubular Reabsorption: Reabsorption of Na+, glucose, HCO3-, urea and water. Filtered load. d) Renal tubular transport. Glucose clearance: TmG. Renal threshold for glucose. e) Tubular Secretion: Secretion of H+ and K+. PAH	06	10

	clearance. f) Introduction and Mechanism of concentrating and diluting the Urine, Regulation of water excretion. g) Micturation: Mechanism of micturation. Cystometrogram. Atonic bladder, automatic bladder. h) Acid-Base balance in brief i) Artificial Kidney: Principle of haemodialysis. j) Skin and temperature regulation.		
	Section II		
1.	**CARDIOVASCULAR SYSTEM** a) Introduction: Physiological anatomy and nerve supply of the heart and blood vessels. Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential. Properties. b) Conducting system: Components. Cardiac Cycle: Definition. Phases of cardiac cycle. Heart sounds – causes, character. c) Cardiac Output: Definition. Normal value. Determinants. Stroke volume and its regulation. Heart rate and its regulation and their variations. d) Arterial Blood Pressure: Definition. Normal values and its variations. Determinants. Peripheral resistance. Regulation of BP. e) Arterial pulse. f) Shock – Definition. Classification–causes and features g) Regional Circulation: Coronary, Cerebral and Cutaneous circulation.	10	16
2.	**RESPIRATORY SYSTEM** a) Function of respiratory system: Pleura, tracheo-bronchial tree, alveolus, respiratory membrane and their nerve supply. Respiratory muscles. b) Mechanics of breathing: Intra-pleural and Intrapulmonary pressure changes during respiration. Lung compliance: Normal value, pressure-volume curve, factors affecting compliance and its variations. Surfactant – Composition, production, functions. c) Spirometry: Lung volumes and capacities. Timed vital capacity and its clinical significance. Maximum ventilation volume. Respiratory minute volume. d) Dead Space: Types and their definition. e) Pulmonary Circulation. Ventilation-perfusion ratio and its importance. f) Transport of respiratory gases: Diffusion across the respiratory membrane. oxygen-haemoglobin dissociation curve. Factors affecting it. Haldane and Bohr Effect. Carbon dioxide transport: Different forms, chloride shift. g) Neural Regulation of Respiration. Hering-breuer's reflex. Voluntary control. Chemical Regulation. h) Hypoxia: Effects of hypoxia. Types of hypoxia. Asphyxia. Cyanosis – types and features. i) Periodic breathing – definition and types. j) Artificial respiration	15	25

Text Book:

Title	Author/s	Publication
Essentials of Medical Physiology	Sembulingam	Jaypee Brothers
Text book of Medical Physiology	John E Hall; Arthur C Guyton	Saunders/Elsevier

Reference Book:

Title	Author/s	Publication
Concise medical physiology	Sujit K. Chaudhuri	New Central Book Agency
Human Physiology	C.C. Chatterjee	CBS Publishers & Distributors
Text of Physiology	A. K. Jain	Avichal
Exercise Physiology	McArdle, Katch&Katch	Lippincott Williams & Wilkins
Review of Medical Physiology	William Francis Ganong	Lange Medical Books
Physiological basis of Medical practice	Best, Taylor and West	Williams & Wilkins
Principles of Anatomy & Physiology	TORTORA	Harper & Row pub.

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with application examples. During the practical, the students will have to complete the experimental verification of the theory content in the physiology laboratory.

Course Evaluation:

Theory:

- Continuous Evaluation Consist of One Test of 20 Marks and submission of assignment which carries 10 Marks
- End Semester Examination will consist of 70 Marks Exam.

Course Code: BPT103

Course Name: EXERCISE THERAPY-I

Prerequisite Course/s: Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
04	00	04	04	30	70			100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Description:

- In this course, the students will learn the basic principles and effects of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions.
- To give a comprehensive insight of the practical application of these in physiotherapy practice.

Course Learning Outcomes: The student will be able to	
CO 1	Describe and present physiological and psychological effects of exercise and movements on body.
CO 2	Understand and apply the knowledge of simple machines, soft tissue manipulation and yogic exercise on Human Body.
CO 3	Comprehend biomechanical principles and appropriate uses of Therapeutic tools necessary in Physiotherapy clinical practice.
CO 4	Learn and demonstrate various exercise therapeutic techniques on healthy subjects.
CO 5	Translate basic principles of biomechanical physics on human movements.
CO 6	Practice the concept of Group, Home and Individual Exercises based on patient conditions aiming rehabilitation.

Course Content:

Section I			
Module	Content	Hours	Weightage in %
1.	**HISTORY OF PHYSIOTHERAPY** Origin, Definition, Scope of profession, Different branches of Physiotherapy.	02	3
2.	**INTRODUCTION TO EXERCISE THERAPY** Aims, Techniques, Approach to the patient's problem, Assessment of the patient's condition, Principles of comprehensive patient management. Physiological effects and uses of exercise, Nervous control of Movement, Psychological aspects of exercise.	05	10
3.	**THERAPEUTIC EXERCISES: CONCEPTS** a) Impact on Physical Function,Components of Physical function, Types of Therapeutic Exercises, b) Classification of health status, Functioning and disability, Strategies for effective exercises c) Prevention, Health and Wellness : Role of Physical Therapist in Health promotion and wellness	08	14
4.	**SIMPLE MACHINES** Lever- Definition, types and uses, anatomical levers, functional levers in physiotherapy, pulley- types and uses, mechanical advantage, anatomical pulley- Angle of pull, pendulum, Elasticity, springs—properties of springs, springs in series and parallel, Hooke's law .	04	6
5.	**SOFT TISSUE MANIPULATION** a) Introduction, brief history, definition, classification b) Physiological effects and therapeutic uses, indications and contraindications. c) Preparation of patient, basic points to be considered prior, during and after the treatment procedure. d) Techniques, effects and uses, indications and contraindications of each. Specific effects of the techniques e) Massage for arm, leg, neck, back and face. f) Massage for Oedema, scar, tendinitis and fibrosis Cyriax transverse friction massage	10	16
6.	**YOGA** Principles of yoga, basic yogic postures and their physiological effects.	10	16
Section II			
7.	**BASIC BIOMECHANICS AND TERMINOLOGIES** Introduction to movements, Types of muscle contraction, Types of muscle work, Group action of muscle, closed chain and open chain kinematics, Active and passive insufficiency, swing and shunt muscles	03	5
8.	**KINEMATICS OF MOVEMENT** Joint movements, axis and plane. Direction of motion, Magnitude of motion, rate of motion.	03	5
9.	**KINETICS OF MOVEMENT** Force- analysis of force (parallelogram law only), tension, gravity,	07	12

	center of gravity, line of gravity, base of support, Friction- types, Importance, effects and uses, Equilibrium, Fixation and stabilization, Potential energy, kinetic energy, work, power, speed, velocity, acceleration, mass, momentum, inertia, moment arm, torque.		
10.	**THERAPEUTIC GYMNASIUM** Orientation to various equipments used in exercise therapy department with its principles, effect and uses – pulleys, springs, axillary crutches, elbow crutches, walker, finger ladder, theraband, dumbbells, weights, weight cuff, sand bags, therapeutic balls, parallel bars, shoulder wheel, shoulder ladder, pronator - supinator instrument, static cycle, rowing machine, ankle exerciser, balancing boards, springs etc and their biomechanical principles.	6	10
11.	**Group, Home and Individual Exercises**	02	3

Text Book:

Title	**Author/s**	**Publication**
Principles of Exercise therapy	Dena Gardiner	i) Bell & Hyman ii) CBS Pub. & Distributors
Practical Exercise therapy	Margaret Hollis	Blackwell Science
Therapeutic Exercise	Carolyn Kisner and Colby	F.A. Davis
Principles and Practice of Therapeutic manipulation	A.G.K.Sinha	Jaypee
Yoga and Rehabilitation	Nilima Patel	Jaypee Brothers

Reference Book:

Title	**Author/s**	**Publication**
Brunnstrom Clinical Kinesiology	Houglum;Bertoti; &Brunnstrom	F.A. Davis
Massage for Therapist	Margaret Hollis	Wiley-Blackwell
Physiotherapy in Orthopaedic conditions [for the study of Basic Yogic postures]	Jayant Joshi and Kotwal	Elsevier
Yoga for Health & Peace	SadashivNimbalkar	Yoga VidyaNiketan

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with application examples. During the practical, the students will be trained with clinical skills.

Theory:

- Continuous Evaluation Consist of One Test of 20 Marks and submission of assignment which carries 10 Marks
- End Semester Examination will consist of 70 Marks Exam.

Course Code: BPT104

Course Name: PSYCHOLOGY

Prerequisite Course/s: Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
04	00	04	04	30	70	-	-	100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Learning Outcomes: The student will be able to	
CO 1	Learn basic concepts of psychology and its importance in the health delivery system.
CO 2	Describe knowledge of psychological maturation during human development, growth, and alteration during the aging process.
CO 3	Differentiate between various types of human personality based on their traits and describe various coping strategies used by different personalities
CO 4	Interpret the various methods of learning and problem solving utilized by human mind and apply the same learning strategies while treating patients
CO 5	To understand concepts of sensation, attention, perception and motivation in view of psychology of person.
CO 6	Explain effects of frustration and conflicts on the person and its management.
CO 7	Explain theories of emotions and various changes in different life situations and understand stress and its management.
CO 8	Describe theories of intelligence along with its assessment.

CO 9	Illustrate different types of thinking and reasoning and outline rules in problem solving and creative thinking.	**PO 2,3**
CO 10	To understand nature and scope of social and abnormal psychology.	**PO 1,3**
CO 11	Explain psychosocial factors of pain with psychological methods in pain management.	**PO 2,5**

Course Content:

Section I			
Module	Content	Hours	Weightage in %
1.	**INTRODUCTION TO PSYCHOLOGY** Definition, application, schools of psychology, methods of psychology, scope of psychology.	05	8
2.	**GROWTH AND DEVELOPMENT** a) Life span: Different stages of development (Infancy, childhood, adolescence, adulthood, middle age, old age) , Psychology need. b) Heredity and environment: role of heredity and environment in physical and psychological development, "Nature v/s Nurture controversy"	05	8
3.	**SENSATION, ATTENTION AND PERCEPTION** a) Sensation: Vision, Hearing, Olfactory, Gustatory and Cutaneous sensation, movement, equilibrium and visceral sense. b) Attention: Types of attention, Determinants of attention (subjective determinants and objective determinants) c) Perception: Gestalt principles of organization of perception (principle of figure ground and principles of grouping), factors influencing perception (past experience and context) d) Illusion and hallucination: different types	05	8
4.	**MOTIVATION** Definition, motivational cycle, types of motives, theories of motivation.	04	7
5.	**FRUSTRATION AND CONFLICT** a) Frustration: sources of frustration. b) Conflict: types of conflict. c) Management of frustration and conflict	03	5
6.	**EMOTIONS** a) Definition, b) Psychological and physiological changes during emotion c) Theories of emotion d) Stress and management of stress.	04	7

7.	**INTELLIGENCE** a) Definition , theories of intelligence b) Distribution of intelligence. c) Assessment of intelligence– intelligence tests	05	8

Section II			
8.	**THINKING** a) Definition , types- , concept formation , Reasoning : deductive and inductive reasoning b) Problem solving: rules in problem solving (algorithm and heuristic) c) Creative thinking: steps in creative thinking, traits of creative people	04	8
9.	**LEARNING** a) Factors effecting learning. b) Theories of learning: trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory. c) The effective ways to learn: Massed/Spaced, Whole/Part, Recitation/Reading, Serial/Free recall, Incidental/Intentional learning, Knowledge of results, association, organization, and mnemonic methods.	07	12
10.	**PERSONALITY** a) Definition, personality development, Approaches to personality: type & trait, behavioristic, psychoanalytic and humanistic approach. b) Personality assessment: observation, situational test, questionnaire, rating scale, interview, and projective techniques. c) Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out.	07	12
11.	**SOCIAL PSYCHOLOGY** a) Definition , nature and scope of social psychology b) Leadership: Different types of leaders. Different theoretical approaches to leadership. c) Attitude: development of attitude. Change of attitude	05	8
12.	**COMMUNICATION** a) Types, b) Effective ways of communication / teaching	02	3
13.	**PAIN PSYCHOLOGY** a) Define pain, physiology of pain b) psycho – social factors of pain c) pain management (Psychological methods)	02	3
14.	**ABNORMAL PSYCHOLOGY** a) Definition, b) Classify psychological disorders (in brief) psycho somatic disorders c) Psychotherapy and counselling.	02	3

Text Book:

Title	Author/s	Publication
Psychology for Physiotherapists.	Ramalingam& Bid	Jaypee Brothers

Reference Book:

Title	Author/s	Publication
Introduction to Psychology	Morgan CT King, Weisz and Schopler	Tata McGraw hill
Understanding Psychology	Feldman. R. H.	Tata McGraw hill

Pedagogy:

The course will be delivered using lectures. The lectures consist of theory content along with application examples.

Course Evaluation:

Theory:

- Continuous Evaluation Consist of one Test of 20 Marks
- Attendance 05 Marks
- Assignment 05 marks
- End Semester Examination will consist of 70 Marks Exam.

Course Code: BPT105

Course Name: COMPUTER APPLICATION

Prerequisite Course/s: Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
02	00	02	02	20	30	-	-	50	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Description:

- To understand the basic Computer Applications.
- The usual lecture will be supplemented with supervised reading and problem sessions, online lessons, websites, and computer software aided learning.

Course Learning Outcomes: The student will be able to	
CO 1	Learn computer operating systems and software.
CO 2	Learn computer applications by demonstrating the appropriate use of a tool including Microsoft Word, Excel, and PowerPoint.
CO 3	Apply the knowledge through Internet sources for Research and organizes Documentation.

Course Content:

Section I			
Module	Content	Hours	Weightage in %
1.	**INTRODUCTION TO COMPUTERS** Introduction and Characteristics, Generation, Classification, Applications of computers, Computer Organization, input & output devices, storage devices.	03	20

2.	**OPERATING SYSTEMS** Definition, Types, and functions of operating systems, Installation and utilities. Windows: Desktop, start-menu, control panel, accessories, my computer, my documents, recycle bin, printer and mouse settings, maximizing, minimizing, restoring and closing of windows, windows explorer	02	13
3.	**WORD PROCESSING TOOLS** Typing and Editing, Finding and Replacing, Autocorrect and Auto text, Reusing Text and Graphics, use of spell-check & grammar, thesaurus and scientific Symbols, viewing of document by various ways Editing Tools, Formatting Text Formatting Text Character, Formatting Paragraphs, Formatting and Sorting Lists, Page Design and Layout. Tools for Reports and Scholarly Papers: Generating Table of contents, Inserting Table of Figures, Generating the bibliography	04	27
4.	**SPREADSHEET TOOLS** Introduction to worksheet, Calculations in sheet, Library functions such as logarithm, square root, sum, average, drawing graphs in spreadsheet line graph, histogram, pie- chart-Editing chart features such as annotation, labeling of axis, changing legends.	03	20
5.	**NETWORKING, INTERNET, AND RESEARCH** Introduction to network and networking devices, Computer networks, networking technology, components of network. Internet – Basic terms, software and hardware requirement for internet, process of internetworking, internet tools. Email- components and working, Computer and Research.	03	20

Text Book:

Title	Author/s	Publication
Fundamentals of Computers	V. Rajaraman	Prentice Hall of India

Reference Book:

Title	Author/s	Publication
Office 2010 All-In-One For Dummies	Peter Weverka	Wiley Publishing, Inc.

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with practical in IT laboratory.

Course Code: BPT106

Course Name: Linguistic Proficiency

Teaching Scheme & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
				Theory		Practical		Tutorial		
Theory	Practical	Tutorial	Credit	CE	ESE	CE	ESE	CE	ESE	Total
2	0	0	2	20	30	0	0	0	0	50

CE: Continuous Evaluation, ESE: End semester Exam

Course Objective: To help the learners to

CO	**Course Learning Outcomes:** The student will be able to
CO1	Identify the concept of LSRW skills in English to deal with people in common social and /or professional situations.
CO2	Infer and respond to instructions, paragraphs, articles, formal and informal communication on reading and listening
CO3	Choose and display the correct vocabulary, grammar and pronunciation related to general social/ business situations
CO4	Analyse and demonstrate effective spoken English in a business context
CO5	Organise the thoughts to write a cohesive paragraph and prepare a script to speak
CO6	Create to speak to participate in a discussion in a small group and write

Learning Outcome: By the end of the course students will be able to

No	**Learning Outcomes**
LO1	Understand the significance of LSRW approach of learning English

LO2	Read, listen to and infer messages, letters, etc. and respond appropriately
LO3	Developbasicvocabulary;uselanguageskillstogetnecessaryinformationfromvarious sources
LO4	Infer various social and business situations
LO5	Speak and write to basic level of comprehension

Course Content

Module	Content	Weightage
1	**Listening: Descriptors/Topics** Listening to the recording on various to pics and responding. The topics may be : Personal information, Travel information, foreign cultures, online lectures and documentaries. Students will be expected to demonstrate level of listening competence as outlined learning outcomes.	25%
2	**Reading and Language; Descriptors/Topics** Reading various online articles, short stories to develop content to present and discuss	25%
3	**Speaking Skills and Non-Verbal Aspects Descriptors/Topics** Speaking Skills, Interactive Nature of Communication - Formal and Informal, Public Speech, Discussion in Pair, Group Discussion, Telephonic Skills-Conversational Manners, Effective Use of Non- Verbal aspects	25%
4	**Writing: Descriptors/Topics** Formal and informal register, learning how to write a paragraph, essay and short speeches	25%

Text Books:

	Title	**Author/s**	**Publication**
1	New Cutting Edge Elementary/ Intermediate Students' Book	Sarah Cunningham and Peter Moor	Longman

Reference Books:

	Title	Author/s	Publication
1	New Cutting Edge Elementary/ Intermediate Students' Book	Sarah Cunningham and Peter Moor	Longman
	New Cutting Edge Elementary/Intermediate Teacher's Book		

Online References:

=>https://www.academia.edu/34869668/New_Cutting_Edge_Elementary_Workbook_With_Key

Contact Hour	Topic Title	Study/HW Resource Reference
1-8	Listening	T1, R1
9-16	Reading and language	T1, R1
17-23	Speaking and Non-Verbal	T1, R1
24-30	Writing	T1, R1

Course Evaluation:

System of Assessment	Weightage
Continuous Evaluation	20
End Semester Examination	30
Total	**50**

Continuous Assessment Components	Listening, Speaking, Reading, Writing	Total-40Marks (05marks each)
End Semester Examination	Listening, Speaking, Reading, Writing	Total–30Marks

Course Code: SPPT107

Course Name: HUMAN ANATOMY-I Practical

Prerequisite Course/s: Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
00	04	04	04	-	-	30	70	100	

CE: Continuous Evaluation, ESE: End Semester Exam

It is designed to provide students with a working knowledge of the structure of the human body which is an essential foundation for their clinical studies. Studies are concerned with the topographical and functional anatomy of the limb. Particular attention is paid with reference to topics of importance to physiotherapy.

Course Description:

Course Learning Outcomes: The student will be able to	
CO 1	Understand and analyzed the necessity of studying anatomy and its possible requirement in future for diagnosing and treating various clinical conditions in physiotherapy practice.
CO 2	Identify and describe the fundamentals of structure anatomy by illustrating diagrams on their body parts or charts.
CO 3	Understand the fundamentals of histology and embryology of the human body.
CO 4	Identify the functions of bones, joints and muscles along with their origin and insertion.
CO 5	Describe the basic terminologies of osteology, histology, general embryology and other basic terms specific to human body.
CO 6	Distinguish and describe the upper extremity and lower extremity components, parts and muscle, connecting tissues of the human body.

List of Practical:

Sr No	Name of Practical	Hours
1.	Upper extremity including surface Anatomy	20
2.	Lower extremity including surface Anatomy	20
3.	Applied anatomy	10
4.	Histology-Elementary tissue including surface Anatomy	05
5.	Embryology-models, charts & X-rays	05

Practical

- Internal Assessment(30)
- Practical End Semester Examination will consist of 70 Marks Exam. i.e Spot(40) Viva(25) Journal (05)

Course Code: BPT108

Course Name: HUMAN PHYSIOLOGY-I Practical

Prerequisite Course/s: Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
00	04	04	04	-	-	30	70	100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Learning Outcomes: The student will be able to	
CO 1	Understand the fundamentals General Physiology like Cell structure and functions in the human body.
CO 2	Discuss basic cell biology, blood and how it relates to fundamental physiological principles and systems.
CO 3	Learn the normal functioning of all the organ systems like Nervous system, Cardiovascular system, Renal system, Respiratory system and their interaction for well-coordinated total body functions.
CO 4	Describe and explain the physiology and functions of Nerve and Muscle, its interactions in human body. Explain Resting membrane potential, Action potential and types of muscle.
CO 5	Distinguish and explain the physiology and functions of cardiovascular system and respiratory system. Describe the conducting system, cardiac output, blood pressure, shock and regional circulation.
CO 6	Explain the physiology and functions of Respiratory system in depth with description of mechanics of breathing, spirometry, transportation of gases, pulmonary circulation and neural regulations and applied physiology of it.
CO 7	Explain and understand the physiology of function and structure of renal system.

List of Practical:

Sr No	Name of Practical/Tutorial	Hours
1.	Hematology-[demonstration only] : RBC Count, WBC Count, Differential WBC Count, Bleeding & Clotting Time, Hb Estimation, ABO & Rh Blood Group, PCV, ESR, platelet count.	15
2.	Graphs : i) Skeletal muscle-properties ii) ECG: definition, different types of leads, waves	12
3.	Mosso's finger ergography	03

Practical

- Internal Assessment(30)
- Practical End Semester Examination will consist of 70 Marks Exam. i.e Practical (30)Spot (20) Viva(15) Journal (05)

Course CodeBPT109

Course Name: EXERCISE THERAPY-I Practicall

Prerequisite Course/s: Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
00	04	04	04	-	-	30	70	100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Description:

- In this course, the students will learn the basic principles and effects of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions.
- To give a comprehensive insight of the practical application of these in physiotherapy practice.

Course Learning Outcomes: The student will be able to	
CO 1	Describe and present physiological and psychological effects of exercise and movements on body.
CO 2	Understand and apply the knowledge of simple machines, soft tissue manipulation and yogic exercise on Human Body.
CO 3	Comprehend biomechanical principles and appropriate uses of Therapeutic tools necessary in Physiotherapy clinical practice.
CO 4	Learn and demonstrate various exercise therapeutic techniques on healthy subjects.
CO 5	Translate basic principles of biomechanical physics on human movements.
CO 6	Practice the concept of Group, Home and Individual Exercises based on patient conditions aiming rehabilitation.

List of Practical:

Sr No	Name of Practical/Tutorial	Hours
1.	Techniques of application of Soft Tissue Manipulation	20
2.	Yoga	20
3.	Exercises and Therapeutic Gymnasium	20

Practical

- Internal Assessment(30)
- Practical End Semester Examination will consist of 70 Marks Exam. i.e Two cases of (25 marks each) , Viva(20)

Course Code: BPT 110

Course Name: COMPUTER APPLICATION Practical

Prerequisite Course/s: Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
00	02	02	02	-	-	20	30	50	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Description:

- To understand the basic Computer Applications.
- The usual lecture will be supplemented with supervised reading and problem sessions, online lessons, websites, and computer software aided learning.

Course Learning Outcomes: The student will be able to		**PO**
CO 1	Learn computer operating systems and software.	**PO 1,2**
CO 2	Learn computer applications by demonstrating the appropriate use of a tool including Microsoft Word, Excel, and PowerPoint.	**PO 1,2**
CO 3	Apply the knowledge through Internet sources for Research and organizes Documentation.	**PO 1.2**

List of Practical:

Sr No	Name of Practical	Hours
1.	Introduction to Computers- Components, OS, Windows Explorer	04
2.	Word Processing Exercises	06
3.	Spread sheets Exercises	10
4.	Presentation Exercises	06
5.	E-mail writing exercises	04

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with practical in IT laboratory.

SEMESTER II

Course Code: BPT201

Course Name: HUMAN ANATOMY-II

Prerequisite Course/s: SPPT1010 **Teaching &**

Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
04	00	04	04	30	70	-	-	100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course description:

It is designed to provide students with the working knowledge of the structure of the human body which is essential foundation for their clinical studies. Studies are concerned with the topographical and functional anatomy of the head & spinal cord, neck and brain including surface anatomy. Particular attention is paid with reference to topics of importance to physiotherapists.

Course Learning Outcomes: The student will be able to	
CO 1	Identify the key concepts of the structure and function of human anatomy.
CO 2	Understand the topographical and functional anatomy of the head & spinal cord, neck and brain including surface anatomy.
CO 3	Correlate clinical and applied anatomy with physical diagnosis and apply in clinical practice of physiotherapy.
CO 4	Identify and describe regional anatomical aspects of muscle, bones & joints and analyse movements of, Thorax, Abdomen, pelvic, Endocrine glands, trunk Head, Neck & Face.
CO 5	Identify and recall the organization of Nervous system including Brain, Spinal Cord and autonomic nervous system in detail from Pathological aspects.
CO 6	Understand and identify the Cranial nerves, Peripheral nervous syste,m and central nervous system's anatomical aspec,ts and itsapplied anatomy.

Course Content:

Section I			
Module	Content	Hours	Weightage in %
1.	**REGIONAL ANATOMY** **Thorax:** a) Cardio – Vascular System: Mediastinum: Divisions and contents Pericardium: Thoracic Wall: position, shape and parts of the heart; conducting System; blood Supply and nerve supply of the heart, anatomy of arteries, veins, capillaries. b) Respiratory system: Outline of respiratory passages. Pleura and lungs: position, parts, relations, blood supply and nerve supply; Lungs – emphasize on Broncho-pulmonary segments. Diaphragm: Origin, insertion, nerve supply and action, openings in the diaphragm. Intercostal muscles and Accessory muscles of respiration: Origin, insertion, nerve supply and action. **Abdomen:** a) Peritoneum: Parietal peritoneum, visceral peritoneum, folds of peritoneum, functions of peritoneum. b) Location, size, shape, features, blood supply, nerve supply and functions of the following: c) Stomach, liver, spleen, pancreas, kidney, urinary bladder, intestines, gall bladder. **Pelvis:** Position, shape, size, features, blood supply and nerve supply of the male and female reproductive system. **Endocrine glands:** Position, shape, size, function, blood supply and nerve supply of the following glands: Hypothalamus and pituitary gland, thyroid glands, parathyroid glands, Adrenal glands, pancreatic islets, ovaries and testes, pineal glands, thymus. **Trunk & Pelvis:** 1. Osteology: Cervical, thoracic, lumbar, sacral and coccygeal vertebrae and ribs. 2. Soft tissue: Pre and Para vertebral muscles, intercostals muscles, anterior abdominal wall muscles, Inter-vertebral disc. 3. Pelvic girdle and muscles of the pelvic floor	30	33
2.	**HEAD AND NECK** 1. Osteology: Mandible and bones of the skull. 2. Soft parts: Muscles of the face and neck and their nerve and blood supply-extra ocular muscles, triangles of the neck, 3. Gross anatomy of eyeball, nose, ears and tongue (not for exam).	20	22
Section II			

3.	**NEURO ANATOMY** a) Organization of Nervous system including Brain, Spinal Cord and autonomic nervous system b) Neuron, Neuroglia c) Cranial nerves (Origin, Course, Function & Test) d) Peripheral nervous system e) Central Nervous System 1. Spinal segments and areas 2. Brain Stem	40	45
	3. Cerebellum 4. Thalamus 5. Hypothalamus 6. Corpus striatum & Internal Capsule 7. Cerebral hemisphere 8. Ventricles of brain 9. Blood supply to brain 10. Basal Ganglia 11. The pyramidal system 12. Anatomical integration		

Text Book:

Title	Author/s	Publication
Human Anatomy – Regional And Applied; Volume I, Volume II and Volume III.	B.D Chaurasia's	CBS Publishers

Reference Book:

Title	Author/s	Publication
Clinical Anatomy for Medical students	Richard Snell	Little Brown and Company Boston
Human Osteology.	InderbirSingh	JP Brothers
Essentials of Anatomy	InderbirSingh	JP Brothers
Gray's Anatomy	Henry Gray	Churchill Livingstone.
Principles of Anatomy & Physiology:	TORTORA	Harper & Row pub.
McMinn's color atlas of Human Anatomy	McMinn	Edinburgh : Mosby Elsevier
Cunningham manual of practical anatomy: Vol I, II, III	D. J. Cunningham; G J Romanes	Oxford University Press

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with cadaver dissection.

Course Evaluation:

Theory:

- Continuous Evaluation Consist of One Test of 20 Marks and submission of assignment which carries 10 Marks
- End Semester Examination will consist of 70 Marks Exam.

Practical

- Internal Assessment(30)
- Practical End Semester Examination will consist of 70 Marks Exam. i.e Spot(40), Viva(25), Journal (05).

Course Code: BPT202

Course Name: HUMAN PHYSIOLOGY-II

Prerequisite Course/s: SPPT1020

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
04	00	04	04	30	70	00	00	100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Learning Outcomes: The student will be able to	
CO 1	Recall and understand the normal physiology and functioning of special senses like vision, Audition, taste and smell.
CO 2	Understand and describe normal physiological aspects and functions of nervous systems and its parts like cerebrum, spinal cord,cerebellum,brain stem, thalamus and hypothalamus, basal ganglia etc.
CO 3	Discuss and explain the physiological aspects of posture, equilibrium, vestibular apparatus ,EEG ,CSF and ANS.
CO 4	Learn the normal physiology and functioning of male & female reproductive function, pregnancy and contraception methods in Reproductive system of human body.
CO 5	Recall the brief knowledge on endocrine and Gastrointestinal system and its normal physiology and functioning.
CO 6	Discuss the basic Exercise physiology its interpret results of various pulmonary and cardiovascular functions.
CO 7	Interpret and evaluate the applied physiology for various conditions related to musculoskeletal and nervous system pathologies in humane body.

Course Content:

Section I			
Module	Content	Hours	Weightage in %
1.	**SPECIAL SENSES** a) Vision: Introduction: Functional anatomy of eye ball. Functions of cornea, iris, pupil, aqueous humor – glaucoma, lens – cataract, vitreous humor, rods and cones. Photopic vision. Scotopic vision. b) Visual Pathway and the effects of lesions. c) Refractive Errors: Myopia, hypermetropia, presbyopia and astigmatism in brief. d) Visual Reflexes: Accommodation, direct and indirect reflexes. Light adaptation. Dark adaptation. Color vision, color blindness. e) Audition: Functions of external ear, middle ear and inner ear. Auditory pathway. Tests for hearing. f) Taste: Taste buds, gustatory pathway. g) Smell: Olfactory pathway.	12	13

2.	**NERVOUS SYSTEM** a) Introduction: Organisation of CNS – Central and Peripheral nervous system. Functions and properties of nervous system. b) Sensory Mechanism including Sensory receptors: function, classification and properties. Sensory pathway: The ascending tracts –their origin, course, termination and functions. The trigeminal pathway. Somatic sensations: include superficial;, Deep and Cortical Sensation. Types of Pain: mechanism & Gate control theory of pain. c) Motor Mechanism: Motor Cortex. Motor pathway: The descending tracts – origin, course, termination and functions. Upper motor neuron and lower motor neuron. d) Reflex Action: definition, types and properties of reflexes in brief. e) Introduction: Spinal cord Lesion, level of injury in brief. f) Brainstem: function of Pons, midbrain and medulla oblongata. g) Cerebellum: functional anatomy of cerebellum connection and their parts. h) Thalamus and Hypothalamus: Nuclei. Functions and connection. i) Reticular Formation, internal capsule and Limbic System: Components and Functions. j) Basal Ganglia: Structures included and functions. k) Cerebral Cortex: Lobes. Brodmann's areas and their functions. Higher functions of cerebral cortex – learning, memory and speech. l) Posture and Equilibrium: Postural reflexes – spinal, medullary, midbrain,cerebral reflexes and stretch	20	23

	reflexes. m) Vestibular apparatus: Function of vestibular apparatus. n) EEG: Waves and features in brief. Sleep: REM and NREM sleep. o) CSF: Formation, composition, circulation and functions. Lumbar puncture and its significance. Blood brain barrier. p) ANS: Features and actions of parasympathetic and sympathetic nervous system.		

3.	**REPRODUCTIVE SYSTEM** a) Introduction: Physiological anatomy, reproductive organs. Sex determination and Sex differentiation. b) Male Reproductive System: Functions of testes. Pubertal changes in males. Spermatogenesis. Testosterone: action. Regulation of secretion. Seminal vesicles, seman. c) Female Reproductive System: Functions of ovaries and uterus. Pubertal changes in females. Oogenesis. Hormones: oestrogen and progesterone-action. Regulation and function of secretion. Mentrual Cycle: Phases. Ovarian cycle. Uterine cycle. ovulation. Menarche. Menopause. Pregnancy: Pregnancy tests. Physiological changes during pregnancy. Functions of placenta. Lactation. Contraception methods	10	10
	Section II		
4.	**ENDOCRINE SYSTEM** a) Introduction: Major endocrine glands. Hormone: classification, mechanism of action. Functions of hormones b) Pituitary Gland: Anterior Pituitary and Posterior Pituitary hormones: action, regulation of secretion of each hormone. Physiology of growth and development. c) Thyroid Gland: Thyroid hormone and calcitonin: secretory cells, action, function and regulation of secretion. d) Parathyroid hormones: action, function and regulation of secretion. e) Adrenal Gland: Adrenal Cortex: Secretory cells, synthesis, action, regulation of secretion of Aldosterone, Cortisol, And Androgens. Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and noradrenaline. f) Endocrine Pancreas: Secretory cells, action, regulation of secretion of insulin. Glucose metabolism and its regulation. g) Calcitrol, Thymus and Pineal gland in brief. h) Local Hormones in brief.	10	10
5.	**DIGESTIVE SYSTEM(in brief)** a) Introduction: Physiological anatomy and nerve supply of alimentary canal. Enteric nervous system b) Salivary Secretion: Saliva: Functions. Regulation.	08	9

	Mastication (in brief) c) Swallowing: Definition. Different stages. Functions. d) Stomach: Functions. Gastric juice: function. Gastrin: function. Gastric motility. Gastric emptying. Vomiting. e) Pancreatic Secretion: production, function. Regulation. f) Liver: Functions of liver. Bile secretion: functions and regulation. Gall bladder: Functions. g) Intestine: Succusentericus: function and regulation of secretion. Intestinal motility and its function. h) Mechanism of Defecation.		
6.	**PHYSIOLOGY OF EXERCISE** Effects of exercise on: 1) Hormonal and metabolic effect 2) Cardiovascular system 3) Respiratory system b) Physiology of Aging. 4) Muscle strength/power/endurance 5) Neuro-musculoskeletal system 6) Effect of gravity/ Altitude/ pressure on physical parameters.	12	14
7.	**APPLIED PHYSIOLOGY** More detailed study of the physiology and practical applications of the following selected topics with emphasis on aspects, which should help in understanding the nature and treatment of common clinical situations of interest in Physiotherapy. **MUSCLES AND NERVOUS SYSTEM FUNCTIONS** 1. Hypotonicity, hypertonicity, myotonia, myasthenia gravis. 2. Pathological reflexes. UMN & LMN disease. 3. Spinal cord disorder: syringomyelia, tabesdorsalis and etc. 4. Ataxia, involuntary movements, involuntary movements. 5. Cerebellar disorders. 6. Parkinson's disease, Wilson's disease. 7. Special senses disease- Vision, taste, hearing, vestibular, Olfaction	8	9
8.	**PULMONARY FUNCTIONS** 1. Brief introduction of respiratory disease including obstructive and restrictive. 2. Disorders of Respiration: Dyspnoea. Orthopnoea. Hyperpnoea, hyperventilation, apnoea, tachypnoea. 3. Artificial respiration 4. Breath sounds.	05	6
9.	**CARDIO VASCULAR FUNCTIONS** 1. Arrhythmia. 2. Hypertension, hypotension. 3. Myocardial infarction, angina pectoris.. 4. PDA. Varicose vein.	05	6

Text Book:

Title	Author/s	Publication
Essentials of Medical Physiology	Sembulingam	Jaypee Brothers
Text book of Medical Physiology	John E Hall; Arthur C Guyton	Saunders/Elsevier

Reference Book:

Title	Author/s	Publication
Concise Medical physiology	Sujit K. Chaudhuri	New Central Book Agency
Human Physiology	C.C. Chatterjee	CBS Publishers & Distributors
Text of Physiology	A. K. Jain	Avichal
Exercise Physiology	McArdle, Katch&Katch	Lippincott Williams & Wilkins
Review of Medical Physiology	William Francis Ganong	Lange Medical Books
Physiological basis of Medical practice	Best, Taylor and West	Williams & Wilkins
Principles of Anatomy & Physiology	TORTORA	Harper & Row pub.

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with application examples. During the practical, the students will have to complete the experimental verification of the theory content in the physiology laboratory.

Course Evaluation:

Theory:

- Continuous Evaluation Consist of One Test of 20 Marks and submission of assignment which carries 10 Marks
- End Semester Examination will consist of 70 Marks Exam.

Course Code: BPT203

Course Name: EXERCISETHERAPY-II

Prerequisite Course/s: SPPT1030

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
04	00	04	04	30	70	-	-	100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Description:

- In this course, the students will learn the basic principles and effects of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions.
- Code of conduct and safe practice in the use of all included techniques.

Course Learning Outcomes: The student will be able to	
CO 1	Comprehend biomechanical principles and appropriate uses of Starting and derived position necessary in Physiotherapy clinical practice.
CO 2	Learn and demonstrate various exercise therapeutic techniques like Active movement and passive movement on healthy subjects.
CO 3	Identify and apply the knowledge of joint mobility and Goniometry on healthy individual with appropriate understanding.
CO 4	Understand and identify the causes for trick movements and apply the thorough knowledge on suspension tools for suspension therapy.
CO 5	Apply the knowledge of strength testing and its application for re-education in the patient population.
CO 6	Conduct and evaluate Gait analysis, training with various ambulatory devices/walking aid used in physiotherapy practices.

Course Content:

Section I			
Module	Content	Hours	Weightage in %
1.	**STARTING AND DERIVED POSITIONS** All fundamental and derived positions with effect, uses and muscle work.	06	10
2.	**ACTIVE MOVEMENTS** a) Free exercise-Definition, classification, principles, technique, indication, contraindication, effects and uses. b) Active assisted exercise: definition, principles, technique, indication, contraindication, effects and uses. c) Assisted- resisted exercise: definition, principles, technique, indication, contraindication, effects and uses. d) Resisted exercise: Definition, classification, principles, technique, indication, contraindication, effects and uses. Difference of manual and mechanical resistance, Specific regimes- delormes, oxford, circuit weight training, Types of isometrics.	06	10
3.	**PASSIVE MOVEMENTS** Definition, Classification, Principles& Techniques, Indication, Effects and Uses.	04	7
4.	**JOINT MOBILITY** Classification of Joints, Position of Joints- Resting position, Closed packed position, Limitation/Restriction of the Range of Joint Movement, Effect of Joint Immobilization,Prevention of Joint Stiffness, Mobilizing methods.	05	8
5.	**GONIOMETRY** Definition, uses, R.O.M.- 0-180 ,180-0, 0- 360 system, active R.O.M., passive R.O.M., Types of Goniometer, principles, techniques, limitations, Technique of measurement for all peripheral joints, spine, causes of restriction of motion, normal and abnormal end feel, distinguish between Skin, Muscle and capsular contractures.	10	17
Section II			
6.	**TRICK MOVEMENTS AND ITS TYPES**	02	3
7.	**SUSPENSION THERAPY** Definition, point of suspension, types, uses for increase joint R.O.M. and muscle power in upper limb and lower limb, indication, contraindication, limitations and benefits.	06	10
8.	**MUSCLE STRENGTH**- Causes of Muscle weakness/paralysis, Prevention of muscle weakness/paralysis, Types of muscle works and muscle contractions, Range of muscle work, Principles of Muscle Strengthening/Re-education,Early re-education of paralysed muscle	06	10
9.	**GAIT**- Definition, normal gait analysis, Limb length measurement, Anthropometric measurements, Pelvic tilt.	08	13
10.	**AMBULATORY DEVICES/WALKING AIDS** Types – crutches, canes & frames, measurement of	07	12

	different devices, uses.), uses of parallel bar in pre crutch training phase, Gait training with the help of different types of ambulatory assistive devices, progression, group of muscle responsible, Walking on even surface, slope, climbing up and down stairs.		

Text Book:

Title	Author/s	Publication
Principles of exercise therapy	Dena Gardiner	i) Bell & Hyman ii) CBS Pub. & Distributors
Practical exercise therapy	Margaret Hollis	Blackwell Science
Measurement of Joint Motion : A Guide to Goniometry	Cynthia Norkin& Joyce White	F.A. Davis
Yoga for Health & Peace	SadashivNimbalkar	Yoga VidyaNiketan

Reference Book:

Title	Author/s	Publication
Therapeutic exercise	Carolyn Kisner and Colby	F.A. Davis
Daniels and Worthingham's Muscle Testing: Techniques of Manual Examination and Performance Testing	Hislop , Avers and Brown	Saunders
Physical Rehabilitation	Susan B. O'Sullivan	F.A. Davis
Physiotherapy in Orthopaedic conditions	Jayant Joshi and Kotwal	Elsevier

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with application examples. During the practical, the students will be trained with clinical skills.

Course Evaluation:

Theory:

- Continuous Evaluation Consist of One Test of 20 Marks and submission of assignment which carries 10 Marks
- End Semester Examination will consist of 70 Marks Exam.

Course Code: BPT204

Course Name: SOCIOLOGY

Prerequisite Course/s: Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)				
Theory	Practical	Total	Credit	Theory		Practical		Total
				CE	ESE	CE	ESE	
02	-	02	02	20	30	-	-	50

CE: Continuous Evaluation, ESE: End Semester Exam

Course Description:

Course Learning Outcomes: The student will be able to	
CO 1	Define, Describe and apply the scientific method to sociology, and explain concepts of sociology.
CO 2	Explain the sociological imagination and the relationship between the individual and the broader works of society.
CO 3	To study the social causes and consequences of health and illness, including the social determinants of health and disease.
CO 4	To know the social behaviour of patients and health care providers, the social functions of health organizations and institutions.

Course Content:

Section I			
Module	Content	Hours	Weightage in %
1.	**INTRODUCTION** a) Meaning- Definition and scope of sociology b) Its relation to Anthropology, Psychology, Social Psychology. c) Methods of Sociological investigations- Case study, social survey, questionnaire, Interview and opinion poll methods. d) Importance of its study with special reference to Health Care Professionals.	04	7
2.	**SOCIAL FACTORS IN HEALTH AND DISEASE SITUATIONS** a) Meaning of social factors	04	7

	b) Role of social factors in health and illness		
3.	**SOCIALIZATION** a) Meaning and nature of socialization b) Primary, Secondary and Anticipatory socialization. c) Agencies of socialization	04	7
4.	**SOCIAL GROUPS** Concepts of social groups, influence of formal and informal groups on health and sickness. The role of primary groups and secondary groups in the hospital and rehabilitation setup.	05	8
5.	**FAMILY** a) The family, meaning and definitions. b) Functions of types of family c) Changing family patterns d) Influence of family on the individuals health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy.	06	10
6.	**COMMUNITY** a) Rural community: Meaning and features –Health hazards of ruralities, health hazards to tribal community. b) Urban community: Meaning and features- Health hazards of urbanities.	04	7
Section II			
7.	**CULTURE AND HEALTH** a) Concept of Health b) Concept of Culture c) Culture and Health d) Culture and Health Disorders	06	10
8.	**SOCIAL CHANGE** a) Meaning of social change. b) Factors of social change. c) Human adaptation and social change d) Social change and stress. e) Social change and deviance. f) Social change and health programme g) The role of social planning in the improvement of health and rehabilitation.	08	13
9.	**SOCIAL PROBLEMS** Consequences of the following social problems & remedies to prevent these problems: a) Population explosion b) Poverty and unemployment c) Beggary d) Juvenile delinquency e) Prostitution f) Alcoholism g) Problems of women in employment h) Geriatric problems (Old age Problem) i) Problems of underprivileged.	10	16%
10.	**SOCIAL SECURITY** Social security and social legislation in relation to the disabled.	05	8

11.	**SOCIAL WORKER** a) Meaning of Social Work b) The role of a Medical Social Worker	04	7

Text Book:

Title	Author/s	Publication
Sociology for Physiotherapists	Bid D	Jaypee Brothers

Reference Book:

Title	Author/s	Publication
Introduction to the study of Sociology	Sachdeva and VidhyaBhushan	Newage
Textbook of Preventive & Social Medicine	K. Parks	BanarsidasBhanot Publishers
Textbook of Preventive & Social Medicine	P.K. Mahajan& M.C. Gupta	Jaypee Brothers

Pedagogy:

The course will be delivered using lectures. The lectures consist of theory content along with application examples.

Course Evaluation:

Theory:

- Continuous Evaluation Consist of one Test of 15 Marks
- End Semester Examination will consist of 35 Marks Exam.

Course Code: BPT205

Course Name: BIOMEDICAL PHYSICS

Prerequisite Course/s: Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
04	-	04	04	30	70	-	-	100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Learning Outcomes: The student will be able to	
CO 1	Understand the fundamentals of general physics and be able to relate its application in Physiotherapy Practice.
CO 2	Recall the basic physical principles of sound, light and heat and their application in Physiotherapy,
CO 3	Discuss basic aspects of electricity and electronics as related to its application in electrotherapy instruments
CO 4	Identify the certain common electrical components such as capacitors, transformers, valves and transistors.

Course Content:

Section I			
Module	Content	Hours	Weightage in %
1.	**GENERAL PHYSICS AND PROPERTIES OF MATTER** a) Force: Definition, unit, resolution of forces, Newton's law of motion, types of motion, force of gravity and centre of gravity, reaction forces, equilibrium, determination of equilibrium of body, work, power, energy, torque. b) Friction: Force of friction, laws of static and dynamic friction, limits of friction, friction a necessity and evil. c) Simple machines: Definition, principle of work, mechanical advantage, velocity ratio and efficiency, lever, pulley and three	10	16

	systems of pulley, wheel and axel. d) Fluid Mechanics and Hydrodynamics: Physical properties of water, Viscosity, definition and co-efficient of viscosity, stream line and turbulent flow, effect of temperature and pressure on viscosity, surface tension, buoyancy, principle of Archimedes, laws of floatation, hydrostatic pressure. e) Elasticity: Definition		
2.	**HEAT** a) Heat transfer, emissive and absorptive power-properties of thermal radiation of a perfectly black body, Kirchoff's law. b) Specific heat, thermal capacity, water equivalent, Newton's law of cooling and specific heat by cooling specific heat of gases, Joule's law of heat production. c) Energy conservation, 1 and 2 laws of thermodynamics. d) Grothus' law. e) Physical effects of heat-expansion, evaporation, thermionic emission etc., concept of heat and temperature, measurement of heat thermometry. f) Human body temperature and its measurement. g) Biophysics of superficial heat and cold.	10	16
3.	**SOUND** a) Origin of sound, Definition-Wavelength, frequency, amplitude, time period, vibration, phases, relation between frequency and wavelength. b) Newton's formula for velocity of sound. c) Lap lace's correction d) Effect of temperature, pressure density of media, humidity and wind, loudness, pitch. e) Interference of sound waves, velocity of sound in water, resonance and velocity of sound in air by resonance method, f) Doppler Effect, echo. g) Ultrasonic – Production and its application, recording and reproduction of sound.	10	16
	Section II		
Module	Content	Hours	Weightage in %
4.	**LIGHT** a) Absorptions and emission spectra, classification of emission spectra sole spectrum and Fraunhofer lines. b) Electromagnetic spectrum-infrared and UV spectrum c) Laws of transmission, reflection, refraction, absorption, interference of light d) LASER and its application, fiber optics	08	14
5.	**ELECTRICITY** a) Conductors and insulators, fundamentals of electricity. b) Different types of capacitors, biological cell as a capacitor. c) Principal laws of electricity-Ohm's law, variable, rheostat and potentiometer. d) Effect of electric current, thermal, chemical and magnetic .	08	14

	e) Electromagnetic induction – mutual – Lenz's law, Faraday's law, Fleming's right hand rule, self-induction, mutual induction, induction coil, induction of EMF in a coil, rotating within the magnetic field, Eddy currents. f) Transformer step up – step down, long distance transmission. g) Production of electricity and mains supply, measurement of AC/DC, modified current, millimeter, voltmeter		
6.	**MODERN PHYSICS** a) Structure of atom (Bohr model) b) X-rays – Production, properties and application. c) IR rays and UV rays – Short wave and microwave diathermy. d) Electric shock – Causes and prevention e) Therapeutic currents –Impulses, definition and types, pulseduration and depletion times. f) Galvanic current, Faradic currents, Surging current, exponentially progressive current, biphasic current. g) Types of electrodes of elector diagnostic and therapeutic application.	07	12
7.	**ELECTRONICS** a) Thermionic valves, semiconductor, diode characteristics, diode as rectifier, Zener diode single stage transistor, advantage of semiconductor over thermionic valves. b) Rectifier, transistors, photo diode, light dependent resistors, light emitting diodes, integrated circuits. c) Amplifier – Production of high frequency currents (microwave) by Klystron magnetron, amplifier C.R.O., triode as amplifier and oscillator, thyratron. d) Electronic circuit – Oscillating circuit, production of shaped pulses, amplification of electrical pulses.	07	12

Text Book:

Title	Author/s	Publication
Electrotherapy Physical Principles Explained	Low & Reed	Elsevier

Reference Book:

Title	Author/s	Publication
Fundamentals of Physics	Halliday, Resnick and Walker	Wiley
Principal of Electronics	Mehta and Mehta	S. Chand
Biophysics: An Introduction	Roland Glaser	Springer

Pedagogy:

The course will be delivered using lectures. The lectures consist of theory content along with application examples.

Course Evaluation:

Theory:

- Continuous Evaluation Consist of one Test of 20 Marks
- Attendance 05 Marks and Assignment 05 Marks
- End Semester Examination will consist of 70 Marks Exam.

Course Code: bpt206

Course Name: FIRST AID AND BASIC LIFE SUPPORT

Prerequisite Course/s: Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)				
Theory	Practical	Total	Credit	Theory		Practical		Total
				CE	ESE	CE	ESE	
02		02	02	20	30	-	-	50

CE: Continuous Evaluation, ESE: End Semester Exam

Course Learning Outcomes: The student will be able to	
CO 1	Understand the basic guidelines and directional procedures to basic life support.
CO 2	Understand the importance of basic life support in the health care system.
CO 3	Learn the applied aspect of the subject for physiotherapy practice.

Course Content:

Section I			
Module	Content	Hours	Weightage in %
1.	**INTRODUCTION TO BASIC LIFE SUPPORT** Scope and need of Basic Life Support	02	7
2.	**HEALTH AND HYGIENE SKILLS** Diseases prevention and control - e.g. hand wash, face mask, self-care, etc…Procedures for self, patients, relatives and medical staff. Decontamination of patient and the environment Patient isolation and staff protection, etc.	02	7
3.	**LIFE SUPPORT SYSTEM** Examination of Vital Signs, Level of Conciseness, Glasgow Coma Scale (GCS)	02	7
4.	**AIRWAY, BREATHING AND VENTILATION ASSESSMENT SKILLS** Instrumentation used in Emergency kit – demonstration Monitoring system - Interpretation of blood gas analysis (ABG), pulse oximetry, capnography, etc. Oxygen therapy – mode of delivery Non-invasive ventilation techniques, etc.	02	7
5.	**CARDIOVASCULAR EMERGENCIES – CARDIO**	02	7

	PULMONARY RESUSCITATION (CPR) Indication of CPR and CPR skills Cardio-pulmonary resuscitation procedures in a timely and effective manner according to the current ILCOR guidelines for adults and children, etc.		
6.	**MUSCULO-SKELETAL INJURIES** 1. Definition: Types of fractures of various parts of the body. 2. Causes, Signs and Symptoms - Rules of treatment 3. Emergency measures in dislocation of joints 4. Emergency treatment of muscle injuries, RICE	02	7
7.	**FIRST AID IN INJURIES, TRAUMA** Cleaning, Dressing, dry and wet dressing for injured areas e.g. cut, open wound, contusion injuries, Antiseptic and antibacterial treatment – external, e.g. betadine, hydrochloride. First line of action. Immobilization, Support, Bandaging - For injured components Immobilization of joint, fracture areas, neck, spine with available material, etc.	02	7
	Section II		
8.	**POSITIONING AND TRANSFERRING PATIENTS** Bed making, fowlers bed and its utility, Positioning of patient, Lifting technique in bed, Transferring from bed to wheel chair, bed to Stretcher, Feeding, tube feeding, drips, transfusion, etc.	02	7
9.	**TEMPERATURE MEASUREMENT PROCEDURES AND BASIC TECHNIQUES OF MANAGEMENT** Measuring and monitoring of body temperature, Cooling techniques (evaporative cooling, ice water or slush immersion) Warming techniques, Treatment and prevention of hyper- and hypothermia in brief, etc.	02	5
10.	**COMMON EMERGENCY AND PREVENTIVE CARE** Burns, shock, Drowning, fire, road traffic accidents (RTA), bleeding, etc. (Do and don't)	02	7
11.	**EMERGENCY MANAGEMENT FOR COMMON COMPLAINTS** 1. Dyspnoea, Headache, Vomiting 2. Pain in arms, legs, Palpitations, cramps, 3. Seizures in adults and children, Syncope	02	7
12.	**POISONING** 1. Classification (irritants, acid, alkali, narcotics), Signs 2. Symptoms, emergency treatment	02	6
13.	**DISASTER MANAGEMENT** Types of Disasters – medical preparedness, Medical preparedness in disaster management, Disaster response, Mass gatherings, etc.	02	5
14.	**BASIC LIFE SUPPORT IN SPORTS AND SPORTS INJURIES**	02	7

15.	**COMMUNITY RESOURCES INCLUDING PRIMARY HEALTH CARE SERVICES** 1. Rural and urban community centers (epidemic and non-epidemic conditions)2. E.g. Civil hospital, PHC, CHC, etc. 3. Police Assistance, Voluntary agencies (local, National, International) 4. Ambulance services (Functions)	02	7

Text Book:

Title	Author/s	Publication
First aid in emergency	St John Ambulance, St Andrew's Ambulance Association, The British Red Cross Society	Dorling Kindersley Publishers
Physiotherapy for Burns and Plastic Reconstruction of the Hand.	Nicole Glassey	Wiley

Reference Book:

Title	Author/s	Publication
Surgical and Medical Procedures for Nurses and Paramedical staff.	P. Nathan	Jaypee Publications
First aid and management of general injuries and common ailments.	Gupta and Gupta	Jaypee Publication

Pedagogy:

The course will be delivered using lectures. The lectures consist of theory content along with application examples.

Language Studies

Course Code: BPT207

Course Name: Global Communication

Teaching Scheme & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)						
				Theory		Practical		Tutorial		
Theory	Practical	Tutorial	Credit	CE	ESE	CE	ESE	CE	ESE	Total
2	0	0	2	20	30	0	0	0	0	50

CE: Continuous Evaluation, ESE: End semester Exam

Course Objective: To help the learners to

No	Course Objectives
CO1	Recognize the concept of LSRW skills in English to deal with people in business situations, increase their knowledge of key business concepts world wide
CO2	Read and understand paragraph, articles, formal and in formal correspondence and hear and understand the instruction sin business situation, comprehend and respond.
CO3	Identify and repair the voids in his present vocabular, grammar usage and pronunciat iontar getting those specific arrays of words which create a barrier in his thought related to general business situations.
CO4	Analyse and demonstrate effective spoken English in a business context
CO5	Enabling the learner to achieve adequate linguistic skills to help them compete international certification tests of English such has BEC ,IELTS and TOEFL
CO6	I m part the correct practices of the strategies of Effective Business writing with anemphasison clarity and brevity, with correct usage of all forms of grammar and vocabulary

Learning Outcome: By the end of the course students will be able to

No	Learning Outcomes
LO1	Recognise and get familiar with the significance of LSRW approach of learning English
LO2	Read, listen to and understand messages, letters, etc. and to respond appropriately, to make summary to use lexical, grammar and grammatical resources.
LO3	Developandapplybusinessvocabulary;essentialeconomicandbusinessinformation; use language skills to get necessary inform action from various sources
LO4	Infer various social and business situations and speak/ write efficiently.
LO5	Participate and perform in BEC, IELTS, TOEFL and placement activities.

Course Content

Module	Content	Weightage
1	**Listening: Descriptors/Topics** Listening to the recording on various to pics and responding. The topics may be: Personal information, Travel information, Work information, Business transactions, Instructions, Arrangements etc. Students will be expected to demonstrate level of listening competence as outlined learning outcomes.	25%
2	**Reading and Language: Descriptors/Topics** Reading various business texts, cases, articles, letters etc. and developing content to present and discuss	25%
3	**Speaking Skills and Non-Verbal Aspects Descriptors/Topics** Speaking Skills, Interactive Nature of Communication - Formal and Informal, Public Speech, Discussion in Pair, Group Discussion, Telephonic Skills-Conversational Manners, Effective Use of Non-Verbal Aspects	25%
4	**Writing Descriptors/Topics** formal and informal register, learning how to write a	25%

	paragraph, formal e-mail, various letters.	

Text Books:

	Title	Author/s	Publication
1	Business Benchmark Pre-intermediate - Intermediate Student's Book	NormanWhitby	Cambridge University Press.

Reference Books:

	Title	Author/s	Publication
1	Business Benchmark Pre-intermediate - Intermediate Teacher's Book	Norman Whit by & Patricia Sanders	Cambridge University Press.

Online References:

https://www.academia.edu/35657288/Business_Benchmark_Pre_Intermediate_to_Intermediate_CAMBRIDGE_Answers_Copy

Contact Hour	Topic Title	Study/HW Resource Reference
1-8	Listening	T1, R1
9-16	Reading and language	T1, R1
17-23	Speaking and Non-Verbal	T1, R1
24-30	Writing	T1, R1

Course Evaluation:

System of Assessment	**Weightage**
Continuous Evaluation	20
End Semester Examination	30
Total	**50**

Continuous Assessment Components	Listening, Speaking, Reading, Writing	**Total-20 Marks (05 marks each)**
End Semester Examination	Listening, Speaking, Reading, Writing	**Total-30 Marks (06 marks each)**

Course Code: BPT208

Course Name: HUMAN ANATOMY-II

Prerequisite Course/s: BPT101

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
00	04	04	04	-	-	30	70	10200	

CE: Continuous Evaluation, ESE: End Semester Exam

Course description:

It is designed to provide students with the working knowledge of the structure of the human body which is essential foundation for their clinical studies. Studies are concerned with the topographical and functional anatomy of the head & spinal cord, neck and brain including surface anatomy. Particular attention is paid with reference to topics of importance to physiotherapists.

Course Learning Outcomes: The student will be able to	
CO 1	Identify the key concepts of the structure and function of human anatomy.
CO 2	Understand the topographical and functional anatomy of the head & spinal cord, neck and brain including surface anatomy.
CO 3	Correlate clinical and applied anatomy with physical diagnosis and apply in clinical practice of physiotherapy.
CO 4	Identify and describe regional anatomical aspects of muscle, bones & joints and analyse movements of, Thorax, Abdomen, pelvic, Endocrine glands, trunk Head, Neck & Face.
CO 5	Identify and recall the organization of Nervous system including Brain, Spinal Cord and autonomic nervous system in detail from Pathological aspects.
CO 6	Understand and identify the Cranial nerves, Peripheral nervous syste,m and central nervous system's anatomical aspec,ts and itsapplied anatomy.

List of Practical:

Sr No	Name of Practical	Hours
1.	Demonstration of the organs in a cadaver. Thorax including surface anatomy, abdominal muscles joints	10
2.	Surface making of the cranial nerves, spinal nerves and important blood vessels.	10
3.	Points of palpation of nerves and arteries.	10

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with cadaver dissection.

Course Evaluation:

Practical

- Internal Assessment(30)
- Practical End Semester Examination will consist of 70 Marks Exam. i.e Spot(40), Viva(25), Journal (05).

Course Code: BPT209

Course Name: HUMAN PHYSIOLOGY-II

Prerequisite Course/s: BPT102

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
00	04	04	04	-	-	30	70	100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Learning Outcomes: The student will be able to	
CO 1	Recall and understand the normal physiology and functioning of special senses like vision, Audition, taste and smell.
CO 2	Understand and describe normal physiological aspects and functions of nervous systems and its parts like cerebrum, spinal cord,cerebellum,brain stem, thalamus and hypothalamus, basal ganglia etc.
CO 3	Discuss and explain the physiological aspects of posture, equilibrium, vestibular apparatus ,EEG ,CSF and ANS.
CO 4	Learn the normal physiology and functioning of male & female reproductive function, pregnancy and contraception methods in Reproductive system of human body.
CO 5	Recall the brief knowledge on endocrine and Gastrointestinal system and its normal physiology and functioning.
CO 6	Discuss the basic Exercise physiology its interpret results of various pulmonary and cardiovascular functions.
CO 7	Interpret and evaluate the applied physiology for various conditions related to musculoskeletal and nervous system pathologies in humane body.

List of Practical:

Sr No	Name of Practical/Tutorial	Hours
1.	Graphs : i. Skeletal muscle-properties ii. ECG: definition, different types of leads, waves	13
2.	Mosso's finger ergography	02
3.	CLINICAL EXAMINATION Respi/cvs/nervous system including higher functions, reflexes, motor & sensory System.	15

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with application examples. During the practical, the students will have to complete the experimental verification of the theory content in the physiology laboratory.

Course Evaluation:

Practical

- Internal Assessment (30) Practical End Semester Examination will consist of 70 Marks Exam. i.e Practical (30)Spot (20) Viva (15) Journal (05).

Course Code: BPT210

Course Name: EXERCISETHERAPY-II

Prerequisite Course/s: BPT103

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
00	04	04	04	-	-	30	70	100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Description:

- In this course, the students will learn the basic principles and effects of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions.
- Code of conduct and safe practice in the use of all included techniques.

Course Learning Outcomes: The student will be able to	
CO 1	Comprehend biomechanical principles and appropriate uses of Starting and derived position necessary in Physiotherapy clinical practice.
CO 2	Learn and demonstrate various exercise therapeutic techniques like Active movement and passive movement on healthy subjects.
CO 3	Identify and apply the knowledge of joint mobility and Goniometry on healthy individual with appropriate understanding.
CO 4	Understand and identify the causes for trick movements and apply the thorough knowledge on suspension tools for suspension therapy.
CO 5	Apply the knowledge of strength testing and its application for re-education in the patient population.
CO 6	Conduct and evaluate Gait analysis, training with various ambulatory devices/walking aid used in physiotherapy practices.

List of Practical:

Sr No	Name of Practical/Tutorial	Hours
1.	Techniques of application of Goniometry	12
2.	Techniques of application of Suspension Therapy	08
3.	Passive movements / Limb length / Girth Measurement / Posture / Group Exercises / Chest Expansion/ Starting OR Derived position etc.	20
4.	Gait analysis, training and Walking Aids	10
5.	Application of Yogasanas and Pranayama in Physical fitness, Flexibility, Posture, Cardio-Respiratory Rehabilitation and Relaxation	10

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with application examples. During the practical, the students will be trained with clinical skills.

Course Evaluation:

Practical

- Internal Assessment(30)
- Practical End Semester Examination will consist of 70 Marks Exam. i.e Long case(40) , Short case (15) Viva(10) Journal (05)

SEMESTER III

Course Code: BPT301

Course Name: EXERCISE THERAPY-III

Prerequisite Course/s: BPT103

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)				
Theory	Practical	Total	Credit	Theory		Practical		Total
				CE	ESE	CE	ESE	
04	00	04	04	30	70	-	-	100

CE: Continuous Evaluation, ESE: End Semester Exam

Course Learning Outcomes: The student will be able to	
CO 1	Describe passive and resisted movements with its types and different exercise regimen with demonstration.
CO 2	Discuss principles, aims, indications and limitations of various methods of testing.
CO 3	Identify indications and contraindications for manual therapy approaches related to limb/spine and differentiate between different schools of thoughts in manual therapy.
CO 4	Demonstrate various techniques of stretching and proprioceptive neuromuscular facilitation (PNF) with proper guidelines for application and interventions.
CO 5	Introduce various techniques of MFR, PRT and neurodynamic and describe the physiological effect, therapeutic use, merits/demerits of same.
CO 6	Recall the basic principles of physics and understand the application of exercise intervention using aquatic environment.

Course Content:

Section I			
Module	Content	Hours	Weightage in %
1.	**PASSIVE MOVEMENTS** Causes of immobility, Specific definitions related to passive movements, Principles and Techniques of giving passive movements.	04	7
2.	**RESISTED MOVEMENTS** Definition of strength, power & work, endurance, muscle actions. Physiology of muscle performance: structure of skeletal muscle, chemical & mechanical events during contraction &relaxation, muscle fiber type, motor unit, force gradation. Causes of decreased muscle performance. Physiologic adaptation to training: Strength & Power, Endurance. Types of resisted exercises: Manual and Mechanical resistance exercise, Isometric exercise, Dynamic exercise: Concentric and Eccentric, Dynamic exercise: Constant versus variable resistance, Isokinetic exercise, Open-Chain and Closed-Chain exercise. Specific exercise regimens, Isotonic: De Lorme's, Oxford, Mac Queen, Circuit weight training, Isometric: BRIME (Brief Resisted Isometric Exercise), Multiple Angle Isometrics, Isokinetic regimens, Plyometrics.	10	16
3.	**METHODS OF TESTING** a) Functional tests b) Tests for neuromuscular efficiency Manual Muscle Testing: Introduction to MMT, Principles & Aims, Indications & Limitations, Techniques of MMT for group & individual muscles : Techniques of MMT for upper limb / Techniques of MMT for lower limb / Techniques of MMT for spine Anthropometric Measurements: Muscle girth – biceps, triceps, forearm, quadriceps, calf c) Measurement of Limb Length: true limb length, apparent limb length, segmental limb length	11	18

Section II			
4.	**MANUAL THERAPY: SPINAL & PERIPHERAL JOINT MOBILIZATION and MANIPULATION** Definitions of terms: Mobilization/Manipulation ,Self mobilization, Mobilization with movement, Physiological and Accessory movements, Schools of Manual Therapy, Principles, Grades, Indications and limitations , Contraindications and precautions, Effects and Uses , Procedure for applying Passive joint techniques, Maitland, Kaltenborn, Biomechanical basis for mobilization, Effects of joint mobilization, Principles of mobilization, Mobilization with movement, Techniques of Vertebral and Peripheral Joint mobilizations.	09	16
5.	**STRETCHING** Definition of terms related to stretching; Properties of contractile and Non- contractile soft tissues, Tissue response towards immobilization and elongation, Determinants and types of stretching exercise including PNF Stretching, Guidelines for application of stretching, Adjuncts to stretching interventions, Precautions and contraindications of stretching, Various Techniques of stretching.	08	13
6.	**PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION** Definitions & goals, Basic neurophysiologic principles and techniques of PNF: Muscular activity, Diagonals patterns of movement: upper limb, lower limb, Procedure: components of PNF, Techniques of facilitation, Mobility: Contract relax, Hold relax, Rhythmic initiation, Strengthening: Slow reversals, repeated contractions, timing for emphasis, Stability: Alternating isometric, rhythmic stabilizations, Skill: timing for emphasis, resisted progression, Endurance: slow reversals, agonist reversal.	08	13
7.	**AQUATIC EXERCISE THERAPY/HYDROTHERAPY:** Goals and outcomes of aquatic exercise, Physics of aquatic Exercise and Thermodynamics, Special Equipment's, Exercise applications, Techniques of aquatic exercises, Approach to patient's problems , Planning and Progression, Contraindications and precautions,	04	7

	Exercise Intervention Using an aquatic Environment.		
8.	**INTRODUCTION TO ADVANCED TECHNIQUES** **Myofascial Release, Positional Release Techniqes and Neuro Dynamics**	06	10

Text Book:

Title	**Author/s**	**Publication**
Therapeutic Exercises, 7th edition	Carolyn Kisner and Colby	F.A. Davis
Practical exercise therapy	Margaret Hollis	Blackwell Science
Principles of Exercise Therapy	Dena Gardiner	i) Bell &Hyman ii) CBS Pub. &Distributors
Daniels and Worthingham's Muscle Testing: Techniques of Manual Examination and Performance Testing	Hislop , Avers and Brown	Saunders

Reference Book:

Title	**Author/s**	**Publication**
Proprioceptive Neuromuscular Facilitation: Patterns and Techniques	Knott, Voss & Myers	Lippincott Williams and Wilkins
PNF in Practice: An Illustrated Guide	Susan S. Adler , Math Buck, DominiekBeckers	Springer
New Directions in Progressive Relaxation Training: A Guidebook for Helping Professionals	Bernstein, Borkovec, Stevens	Praeger Publishers
Therapeutic Exercise: Moving Toward Function	Brody and Hall	Lippincott Williams and Wilkins

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with application examples. During the practical, the students will be trained with clinical skills.

Course Evaluation:

Theory:

- Continuous Evaluation Consist of One Test of 20 Marks and submission of assignment which carries 10Marks
- End Semester Examination will consist of 70 Marks Exam.

Course Code: BPT302

Course Name: ELECTROTHRAPY –I

Prerequisite Course/s:

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
04	00	04	04	30	70	-	-	100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Description:

The student will learn the Principles, Techniques, Effects, Indication, Contra-Indication and the dosage parameter for various indications of electro therapeutic modalities in the restoration of physical function.

Course Learning Outcomes: The student will be able to	
CO 1	Explain nerve-muscle physiology.
CO 2	Acquire knowledge of basic types of currents with modifications and their technique of applications.
CO 3	Describe the production and physiological effects, therapeutic uses, merits, demerits, indications and contraindications of various low/medium frequency currents/ modes.
CO 4	Discuss the physiological effects and therapeutic uses of various iontophoresis and phonophoresis.

Course Content:

Section I			
Module	Content	Hours	Weightage in %
1.	**NERVE MUSCLE PHYSIOLOGY**: Action Potential, Resting membrane potential, Propagation of Action Potential, Motor unit, synapse, Accommodation, Stimulation of Healthy Muscle, Stimulation of Denervated Muscle, Stimulation for Tissue Repair	04	7
2.	**BASIC TYPES OF CURRENTS** a) Direct Current: types, physiological & therapeutic effects. b) Alternating Current **TYPES OF CURRENT USED IN THERAPEUTICS** a) Modified D.C : Faradic Current ,Galvanic Current b) Modified A.C : Sinusoidal Current, Diadynamic current	03	4
3.	**FARADIC CURRENT** Definition, Modifications, Techniques of Application of Individual, Muscle and Group Muscle stimulation, Physiological & Therapeutic effects of Faradic Current, Faradic foot Bath, Faradism under pressure; Pelvic floor muscle reeducation, Precautions, Indications & Contra- Indications, Dangers.	04	7
4.	**GALVANIC CURRENT** Definition, Modifications, Physiological & Therapeutic effects of Galvanic Current, Indications & Contra- Indications, Dangers, Effect of interrupted galvanic current on normally innervated and denervated muscles and partially denervated muscles.	04	7
5.	**Types of Electrical Stimulators:** NMES, Diagnostic Stimulators- Construction, components & Working Principles. Cathodal /Anodal Galvanism **Principles of Application:** Electrode tissue interface, Tissue Impedance, Types of Electrodes and Placement of Electrodes	03	5

6.	**ELECTRODIAGNOSIS** • **FG Test** • **SD CURVE**: Methods of Plotting SD Curve, Apparatus selection, Characters of Normally innervated Muscle, Characters of Partially Denervated Muscle,Characters of Completely denervated Muscle, Chronaxie & Rheobase. • **Nerve Conduction Velocity studies** • **EMG: Construction of EMG Equipment**	10	16
7.	**IONIZATION / IONTOPHORESIS** Techniques of Application of Iontophoresis, Indications, Selection of Current, Commonly used Ions (Drugs) for pain, Hyperhidrosis, Wound Healing	04	7
	Section II		
8.	**HIGH VOLTAGE PULSED GALVANIC STIMULATION** Description, Physics, Characteristics of HVPGS, Methods of Application, Indications and Contraindications	03	5
9.	**MICROCURRENTS** Description, Physics, Characteristics of Microcurrents, Methods of Application, Indications and Contraindications	03	5
10.	**TENS** Define TENS, Pain Gate Control Theory, Types of TENS, Conventional TENS, Acupuncture TENS and Electro Acupuncture, Burst TENS, Brief & Intense TENS, Modulated TENS. Types of Electrodes & Placement of Electrodes, Dosage parameters, Physiological & Therapeutic effects, Indications &Contraindications.	06	10
11.	**MEDIUM FREQUENCY CURRENTS** Interferential Therapy**:** Define IFT, Principle of Production of IFT, Static Interference System, Dynamic Interference system, Dosage Parameters for IFT, Electrode placement in IFT, Physiological & Therapeutic effects, Indications & Contraindications. **Russian Currents**	06	10

12.	**BIO-FEED BACK** Introduction, Principles of Bio-Feedback, Therapeutic effects, Procedure of Application , Criteria for patient selection For EMG Bio-Feed Back Training	04	7
13.	**FUNCTIONAL ELECTRICAL STIMULATION**	02	3
14.	**MECHANICAL SPINAL TRACTION** Description, Cervical and Lumbar Traction, Principles, Procedure, Indications, Precautions, Contraindications	04	7

Text Book:

Title	**Author/s**	**Publication**
Electrotherapy Simplified 3rdEdition	Basanta Kumar Nanda	Jaypee Publications
Electrotherapy Explained 4th Edition	Robertson,Ward,Low& Reed	Elsevier
Therapeutic Modalities in Rehabilitation, 4th Edition	William E. Prentice	McGraw Hill
Physical Agents in Rehabilitation: From Research to Practice	Cameron MH	Elsevier Saunders

Reference Book:

Title	**Author/s**	**Publication**
Claytons Electrotherapy, 9th Edition	Forster &Plastanga	BaillereTindall/AITBS
Electrotherapy Evidence Based Practice: 12th Edition	Tim Watson	Elsevier
Electrotherapy in Rehabilitation (Contemporary Perspectives in Rehabilitation)	Meryl Roth Gersh	F.A. Davis
Modalities for Therapeutic Intervention	Michlovitz SL, Bellew JW, Nolan TP Jr	F.A. Davis
Integrating Physical Agents in Rehabilitation	Hecox B, Mehreteab TA, Weisberg J, Sanko J	Prentice Hall
Principles and Practice of Electrotherapy	Joseph Kahn	Churchill Livingstone
Therapeutic ElectrophysicalAgents: Evidence Behind Practice	Alain Yvan Belanger	Wolters Kluwer

Laboratory Manual for Physical Agents: Theory and Practice	Behrens BJ	F.A. Davis
Manual for Physical Agents	Hayes KW, Hall KD	Pearson
Clinical Electrotherapy	Nelson, Currier, Hayes	Pearson

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with application examples. During the practical, the students will be trained with clinical skills.

Theory:

- Continuous Evaluation Consists total of 30 marks (One Test of 20 Marks and submission of assignments and attendance carries 10 Marks)
- End Semester Examination will consist of 70 Marks Exam.

Course Code: BPT303

Course Name: BIOCHEMISTRY
Prerequisite Course/s : Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
04	-	04	04	30	70	-	-	100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Descrition:

Itwilldealwiththemetabolismthattakesplacewithinthebodyandrelateddisorders.It also deals with nutrition and daily requirements of it and related disorders.

Course Learning Outcomes: The student will be able to	
CO 1	Explain sources and nutritional aspects of metabolism of carbohydrates, lipids, proteins & vitamins.
CO 2	Describe the Normal and abnormal findings related to Clinical biochemistry.
CO 3	Determine correlation among nutrition deficiency, exercise performance and biochemical changes.
CO 4	Describe the effects of enzymes, vitamins and minerals on body processes and physiology.

Course Content:

Module	Content	Hours	Weightage in %
1.	**Bio-Physics:** Concepts of pH and buffers, Acid-base equilibrium, osmotic pressure and its physiological applications.	02	4
2.	**Carbohydrate, Proteins and lipids:-** Functions, classification and its importance. Nucleic acids: Structure and functions of DNA, RNA and its Types	04	9
3.	**Enzymes :** Classification and its mode of action	03	7
4.	**Vitamins:** Classification- Fat soluble vitamins A, D, E, K Water soluble vitamins-B Complex and Vitamin **'C'.**	03	7
5.	**Carbohydrate Metabolism:** Glycolysis, TCA Cycle, Glycogenesis, Glycogenolysis, Gluconeogenesis	06	12
6.	**Lipid metabolism (Fatty acid):** Beta and omega oxidation of fattyacids	04	9
7.	**Protein metabolism :** Transamination, Deamination, Fate of Ammonia, Urea synthesis	04	9
8.	**Mineral metabolism:** Calcium, Phosphorous; Sodium and potassium metabolism	03	7
9.	**Blood and its components**- RBC, WBC and Plasma	03	7
10.	**Clinical Biochemistry** Normal levels of blood (WBC, RBC and platelets) and urine (Glucose, Urea, Uric acid, Creatinine, Calcium, Phosphates, pH and Bicarbonate) constituents, Liver function tests, Renal function tests, ELISA test, RIA test, Serological tests, Flow Cytometer.	03	7
11.	**Nutrition**	10	22
	a) Introduction, Importance of nutrition, Calorific values,		

	b) Respiratory quotient – Definition, and its significance c) Energy requirement of a person - d) Basal metabolic rate: Definition, Normal values, factor affecting BMR e) Special dynamic action of food f) Physical activities - Energy expenditure for various activities. g) Calculation of energy requirement of a person h) Balanced diet, Recommended dietary allowances i) Role of carbohydrates in diet: Digestible carbohydrates and dietary fibers j) Role of lipids in diet. k) Role of proteins in diet: Quality of proteins - Biological value, net protein utilization, Nutritional aspects of proteins- essential and non-essential amino acids. Nitrogen balance l) Nutritional disorders j)Diet for chronically ill and terminally ill patients		

Text Book:

Title	Author/s	Publication
Essentials of Biochemistry	Satyanarayana and Chakrapani	Books & Allied (P) Ltd

Reference Book:

Title	Author/s	Publication
Lehninger Principles of Biochemistry, 7 ed	David L Nelson and Michael M Cox	Macmillan Education
Text Book of Bio Chemistry for Medical students.	Vasudevan, SreeKumari and Vaidyanathan	JP Medical
Biochemistry	Debajyoti Das	Academic Publishers

Pedagogy:

The course will be delivered using lectures. The lectures consist of theory content along with application examples.

Course Evaluation:

Theory:

- Continuous Evaluation Consist of one Test of 15Marks
- End Semester Examination will consist of 35 MarksExam

Course Code: BPT304

Course Name: PHARMACOLOGY

Prerequisite Course/s: Nil

Teaching & Examination Scheme*:*

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)				
Theory	Practical	Total	Credit	Theory		Practical		Total
				CE	ESE	CE	ESE	
02	-	02	02	20	30	-	-	50

CE: Continuous Evaluation, ESE: End Semester Exam

Course Description:

This course introduces the student to basic pharmacology of common drugs used, their importance in the overall treatment including Physiotherapy. The student will be aware of the contribution of both drug and physiotherapy factors in the outcome of treatment.

Course Learning Outcomes: The student will be able to	
CO 1	Describe Pharmacological effects of commonly used drugs on various systems.
CO 2	Discuss and compare adverse effects and contraindications for drugs affecting the various systems of human body.
CO 3	Indicate the use of analgesics & anti-inflammatory with movement disorders, efficiency & safety for individual needs.
CO 4	Illustrate clinical conditions, explain and infer the appropriate use of drugs in the particular diseases.

Course Content:

Module	Content	Hours	Weightage in %
1.	**General Pharmacology** Introduction, Definitions, Classification of drugs, Sources of drugs, Routes of drug administration, Distribution of drugs, Metabolism and Excretion of drugs Pharmacokinetics, Pharmacodynamics, Factors modifying drug response, Adverse effects. Rational use of Drugs, Principles of Therapeutics	05	11
2.	**Autonomic Nervous System** General considerations – The Sympathetic and Parasympathetic Systems, Receptors, Somatic Nervous System, Cholinergic and Anti-Cholinergic drugs, Adrenergic and Adrenergic blocking drugs, Peripheral muscle relaxants.	05	11
3.	**Cardiovascular Pharmacology** a) Drugs Used in the Treatment of Heart Failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors b) Antihypertensive Drugs: Diuretics, Beta Blockers, Calcium Channel Blockers, ACE Inhibitors, Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct acting Vasodilators, Anti arrhythmic Drugs c) Drugs Used in the Treatment of Vascular Disease and Tissue Ischemia : Vascular Disease, Hemostasis Lipid- Lowering agents, Antithrombotics, Anticoagulants and Thrombolytics Ischemic Heart Disease – Nitrates,Beta- Blockers, Calcium Channel Blockers d) CerebralIschemia e) Peripheral VascularDisease	05	11

4.	**Neuropharmacology** Introduction, Alcohols, Sedatives and Hypnotics, Anti-convulsants, Analgesics and Antipyretics, General anesthetic, Local anesthetic, Antianxiety Drugs: Benzodiazepines, Other Anxiolytics, Very brief introduction of Psycho Therapeutics: Treatment of Mood Disorders (Monoamine Oxidase Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants, Lithium, Antipsychoticdrugs).	05	11
5.	**Disorders Of Movement** Drugs used in Treatment of Parkinson's Disease Antiepileptic Drugs, Spasticity and Skeletal Muscle Relaxants	04	9
6.	**Inflammatory/Immune Diseases** a) Non-narcotic Analgesics and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs,Aspirin, Nonaspirin NSAIDs, drug Interactins with NSAIDs b) Glucocorticoids: Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use ofGlucocorticoids c) Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis,Gout d) Drugs Used in the Treatment of Neuromuscular Immune/Inflmmatory Diseases: Myasthena gravis, Haematinics, Vitamin B,Iron. e) Very brief introduction of: idiopathic Inflammatory Myopathies, systemic lupus Erythmatosus, Scleroderma, Demyelinating Disease. Haematinics, Vitamin B,Iron. f) Respiratory Pharmacology : Upper Respiratory Tract infections-sinusitis, Laryngitis, Pharyngitis, Bronchial Asthma, COPD- effects of prolonged drugadministration, Cough suppressant	09	20
7.	**Drugs acting on G.I System** Gastrointestinal Pharmacology: Vomiting, Peptic Ulcer Disease, Constipation,Diarrhea	02	4

8.	**Drugs Used for Hormonal disorders,Supplementation andContraception** Drugs Used in Treatment of Diabetes Mellitus: Insulin, Oral Hypoglycemics Disorder of thyroid hormone: drugs for hypo and hyperthyroid Very brief introduction of sex hormone and hormonal contraceptives Corticotrophins &Gonadotrophins, Adrenaline, Prostoglandins Calcitonins, Calcium salts,Calcium Regulators	04	9
9.	**Geriatrics** Pharmacology and the geriatric Population: Adverse effects of special concern in the Elderly, Dementia, Postural Hypotension	02	4
10.	**Antibiotics** Definition, choice of agents, Narrow and Broad Spectrum Antibiotics, resistance, prophylactic groups, Very brief introduction of drugs name, mechanism, uses and specific Toxicity	02	5
11.	**Vitamins** **Vitamin A,B,C,D, E and K**	02	5

Text Book:

Title	**Author/s**	**Publication**
Essential of Medical Pharmacology	K. D. Tripathi	Jaypee Brothers Medical Publishers

Reference Book:

Title	**Author/s**	**Publication**
Text book of Medical Pharmacology	PadmajaUdaykumar	CBS Publishers
Concise Textbook of Pharmacology	N. Murugesh	Sathya Publishers
Pharmacology &Pharmacotherapeutics	Satoskar	Elsevier

Pedagogy:

The course will be delivered using lectures. The lectures consist of theory content along with application examples.

Course Evaluation:

Theory:

- Continuous Evaluation Consist of one Test of 20Marks
- End Semester Examination will consist of 30 MarksExam.

Course Code: BPT305

Course Name: PATHOLOGY

Prerequisite Course/s: Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
04	-	04	04	30	70	-	-	100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Learning Outcomes: The student will be able to	
CO 1	Describe the process of cell injury and its changes in various tissue.
CO 2	Discuss pathology of different organ systems for understanding disease process and their clinical significance with system.
CO 3	Explain sign and symptoms of selected disease conditions.

Course Content:

Section I (General Pathology)			
Module	Content	Hours	Weightage in %
1.	**INTRODUCTION TO PATHOLOGY** Subdivisions of Pathology, Key terms used in pathology viz. etiology, morphological changes, lesions, primary & secondary, acute & chronic	01	2

2.	**CELLULAR INJURIES** Causes & mechanism of cell injury, reversible & irreversible cellular injuries	02	3
3.	**CELL DEATH & CELL NECROSIS** Different types of cell necrosis, its gross & microscopic appearances, gangrene & its different types; Apoptosis	02	3
4.	**CELLULAR ADAPTATIONS** Hypertrophy, hyperplasia, atrophy, Metaplasia, cellular dysplasia	02	3
5.	**CELLULAR CHANGES & INFORMATION** Cloudy swelling, hydropic change, fatty change, mucoid change, pathological calcification	02	3
6.	**AMYLOIDOSIS** Definition, classification, nature of amyloid, clinical significance	01	2
7.	**PATHOLOGY OF DIABETES MELLITUS** Definition, classification of diabetes, Pathology of - renal, cardiovascular, ophthalmic & neurological complications.	02	3
8.	**INFLAMMATION** Acute inflammation - definition, causes, vascular events, exudates formation, chemical mediators of inflammation , Chronic inflammation - general feature, Granulomatous inflammation, examples of Granulomatous inflammation	04	7
9.	**WOUND HEALING** Regeneration, repair, healing by primary & secondary union, **factors affecting healing, healing of bone fracture.**	03	5
10.	**HEMODYNAMIC CHANGES** **Oedema, hyperaemia& congestion, thrombosis, embolism, infarction, shock.**	04	7
11.	**TUMOR PATHOLOGY** **Definition, classification, characteristics of benign & malignant tumors, pathogenesis & spread of tumors.**	03	5
Section II (Systemic Pathology)			
12.	**GASTROINTESTINAL TRACT** Peptic ulcer, benign & malignant tumors of intestine, infective & inflammatory bowel diseases, typhoid ulcer, intestinal tuberculosis, 'Crohn's disease, ulcerative colitis.	02	3

13.	**LIVER DISEASE** Viral hepatitis A, viral hepatitis B, viral hepatitis c, cirrhosis of liver, portal hypertension, pathology of jaundice	02	3
14.	**GENITOURINARY TRACT** Acute &chronic renal failure, definition &classification of glomerulonephrotis, hydronephrosis, urinary calculi, classification of testicular & ovarian tumors.	02	3
15.	**MUSCULOSKELETAL SYSTEM** a) Osteomyelitis, osteoporosis, osteoarthritis,rheumatoid arthritis, gout,psoriasis b) Muscle disease – myopathic and Neurogenicdisorders, inflammatory myopathy, musculardystrophies	04	7
16.	**RESPIRATORY SYSTEM** Bronchitis, pulmonary hypertension, pulmonary tuberculosis, pneumonia, emphysema, Bronchiectasis, neonatal respiratory syndrome, adult respiratory syndrome	04	7
17.	**CARDIOVASCULAR SYSTEM** a) Blood Vessels: Atherosclerosis,aneurysm, phelebothrombosis,thrombophelebitis b) Heart Disease: Rheumatic heart disease, bacterial endocarditis, hypertensive heart disease, coronaryheart disease, congenital heart diseases	06	10
18.	**CENTRAL NERVOUS SYSTEM** Meningitis, encephalitis, hydrocephalus, cerebrovascular disease, poliomyelitis, epidural & subdural hematoma	04	8
	(Hematology)		
19.	**ANAEMIAS** Definition, classification, Fe deficiency ananemia, B12 deficiency ananemia, hemolytic ananemias, thalassemia, sickle cell ananemia, G6PD deficiency ananemia, aplastic ananemia.	03	5
20.	**LEUKEMIAS** Definition & classification, acute myeloblastic leukemia, acute lymphoblastic leukemia, chronic myeloid leukemia, chronic lymphocytic leukemia	03	5
21.	**HAEMORRHAGIC DISORDERS**	02	3

	Haemophilia, purpura, prothrombin time		
22.	**BLOOD BANKING** Blood groups, cross matching, blood transfusion reaction, selection of blood donor, blood components	02	3

Text Book:

Title	**Author/s**	**Publication**
Textbook of Pathology	Bhende, Deodhare, Kelkar	Popular Prakashan
Essential Pathology for Physiotherapy students	Harsh Mohan	Jaypee Publication
Illustrated Pathology	Fiona Roberts	Elsevier

Reference Book:

Title	**Author/s**	**Publication**
Anderson Pathology	Ivan Damjano and James Linder	Mosby
Text book of Pathology	Robbins and Kumar	Elsevier
Text book of Pathology	Harshmohan	Jaypee Publication

Pedagogy:

The course will be delivered using lectures. The lectures consist of theory content along with application examples.

Course Evaluation:

Theory:

- Continuous Evaluation Consist of one Test of 30 Marks
- End Semester Examination will consist of 70 Marks Exam.

Course Code: BPT306

Course Name: MICROBIOLOGY

Prerequisite Course/s: Nil

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
				Theory		Practical			
Theory	Practical	Total	Credit	CE	ESE	CE	ESE	Total	Remarks
02	-	02	02	20	30	-	-	50	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Descriptions:

In this course, the students will learn the study of common organisms causing diseases including nosocomial infections and precautionary measures to protect one from acquiring infections.

Course Learning Outcomes: The student will be able to	
CO 1	Elaborate the classification of microorganism and morphology of bacteria along with various viral infections (Polio, Rubella, Hepatitis, HIV)
CO 2	Explain various steps of collection of clinical specimens and different sterilization and disinfection techniques.

Course Content:

Module	Content	Hours	Weightage in %
1.	**GENERAL MICROBIOLOGY** i)Introduction and historical background ii)Classification of micro-organisms iii) Morphology of bacteria iv)Sterilization and disinfection	06	20
	SYSTEMIC MICROBIOLOGY i)Gram positive cocci- Staph, Strepto, Pneumnococci ii) Gram negative cocci-Goncocci and Meningococci iii) Gram positivebacilli- Tubercule bacilli, Lepra bacilli, Clostridium tetani, Clostridium perfrigens etc. iv) Gram negative bacilli- Salmonella, Coloforms, pseudomonas, proteus etc. v)		

2.	Anaerobic non-sporingcocci and bacilli vi) Applied microbiology as relevant to diseases of bones, joints, muscles, skin, infections andburns.	08	27
3.	i) **VIROLOGY**- General introduction, brief description of polio virus, Rubella Hepatitis-B and AIDS (diagnosis, prevention andtreatment) **ii) SPIROCHETES** – Syphilis (congenital and acquired) iii)**MALARIA**	08	26
4.	**IMMUNITY** Antigents and Antibodies, General overview of antigen antibody reaction and practical applications.	08	27
5.	**DEMONSTRATION** i) Demonstration of collection of clinicalspecimens ii) Demonstration of morphology and culture of organisms. iii) Demonstration of simple , Gram's and Ziehi-Neelsen staining iv) Sterilization and disinfectiontechniques v) Demonstration hepatitis etc. of serological tests for syphilis		

Text Book:

Title	Author/s	Publication
Short textbook of Medical Microbiology	Sathish Gupta	Jaypee Brothers
A Text book of Microbiology	Chakraborthy	New Central Book Agency
Text book of Microbiology 6th edn	C.P Baveja	Arya Medical Publishing House

Reference Book:

Title	Author/s	Publication
Microbiology & Parasitology	K. Rajeshwar Reddy	Paras Medical Publisher
Text book of Microbiology	Anantha Narayanan and JayaramPanicker	Universities Press
Microbiology	Pelczar	Tata McGraw-Hill
Microbiology	Prescott	McGraw-Hill

Pedagogy:

The course will be delivered using lectures. The lectures consist of theory content along with application examples.

Course Evaluation:

Theory:

- Continuous Evaluation Consists total of 30 marks (One Test of 20 Marks and submission of assignments and attendance carries 10 Marks)
- End Semester Examination will consist of 70 Marks Exam.

Course Code: BPT307

Course Name: **CLINICAL TRAINING**

Prerequisite Course/s:

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical/Clinical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
-	02	02	2	-	-	20	30	50	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Learning Outcomes: The student will be able to	
CO 1	Student should learn to be a professional with suitable attire and observe questioning and evaluation methods in clinical setup.
CO 2	Explain & discuss the concept of detail History taking during assessing patients before giving any treatment.
CO 3	Understand appropriate assessment chart and interpret medical file under supervision.
CO 4	Execute application of electro physical agents on patients.
CO 5	Learn how to communicate with patients and be able to build-up therapeutic relationships.

Course Evaluation: **Practical**

In Clinical Training, Evaluation will be done based on Continuous Evaluation (submission of assignment) and Attendance which will consist of 50 marks.

Course Code: BPT308

Course Name: EXERCISE THERAPY-III

Prerequisite Course/s: BPT103

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)				
Theory	Practical	Total	Credit	Theory		Practical		Total
				CE	ESE	CE	ESE	
00	04	04	04	-	-	30	70	100

CE: Continuous Evaluation, ESE: End Semester Exam

Course Learning Outcomes: The student will be able to	
CO 1	Describe passive and resisted movements with its types and different exercise regimen with demonstration.
CO 2	Discuss principles, aims, indications and limitations of various methods of testing.
CO 3	Identify indications and contraindications for manual therapy approaches related to limb/spine and differentiate between different schools of thoughts in manual therapy.
CO 4	Demonstrate various techniques of stretching and proprioceptive neuromuscular facilitation (PNF) with proper guidelines for application and interventions.
CO 5	Introduce various techniques of MFR, PRT and neurodynamic and describe the physiological effect, therapeutic use, merits/demerits of same.
CO 6	Recall the basic principles of physics and understand the application of exercise intervention using aquatic environment.

List of Practical:

Sr No	Name of Practical/Tutorial	Hours
1.	Demonstrate to apply the techniques of Active and Passive movements	05
2.	Demonstrate Manual Muscle Testing	10
3.	Demonstrate the techniques for muscle strengthening based on MMT grading	05
4.	Demonstrate techniques of strengthening muscles using resisted exercises	08
5.	Demonstrate Mobilization of individual joint regions	12
6.	Demonstrate the techniques for muscle stretching in Anatomical planes of Motion	10
7.	Demonstrate the PNF techniques	10

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with application examples. During the practical, the students will be trained with clinical skills.

Course Evaluation:

Practical

- Internal Assessment(30)
- Practical End Semester Examination will consist of 70 Marks Exam. i.e Long case(30) , Short case(20) ,Viva(15) Journal(05)

Course Code: BPT309

Course Name: ELECTROTHRAPY –I

Prerequisite Course/s:

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
04	04	04	04	-	-	30	70	100	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Description:

The student will learn the Principles, Techniques, Effects, Indication, Contra-Indication and the dosage parameter for various indications of electro therapeutic modalities in the restoration of physical function.

Course Learning Outcomes: The student will be able to		**PO**
CO 1	Explain nerve-muscle physiology.	**PO 1,2**
CO 2	Acquire knowledge of basic types of currents with modifications and their technique of applications.	**PO 1,10**
CO 3	Describe the production and physiological effects, therapeutic uses, merits, demerits, indications and contraindications of various low/medium frequency currents/ modes.	**PO 2,10**
CO 4	Discuss the physiological effects and therapeutic uses of various iontophoresis and phonophoresis.	**PO 2,10**

List of Practical:

The student of Electrotherapy must be able to demonstrate the use of Electrotherapy modalities, methods of application and procedures with proper techniques, choice of dosage parameters and safety precautions.

Sr No	Name of Practical	Hours
1.	Demonstrate the technique for patient evaluation – receiving the patient and positioning the patient for treatment using electrotherapy.	05
2.	Collection of materials required for treatment using electrotherapy modalities and testing of the apparatus.	06
3.	Demonstrate placement of electrodes for various electrotherapy modalities	05
4.	Electrical stimulation for the muscles supplied by the peripheral nerves	12
5.	Faradism under Pressure for UL and LL	04
6.	Plotting of SD curve with Chronaxie and Rheobase	08
7.	Demonstrate FG Test	04
8.	Demonstrate treatment method using IFT for various regions	05
9.	Demonstrate treatment method using TENS, HVPGS and Microcurrents for various regions	06
10.	Demonstrate treatment method using Cervical and Lumbar Mechanical Traction	05

Pedagogy:

The course will be delivered using lectures & practical. The lectures consist of theory content along with application examples. During the practical, the students will be trained with clinical skills.

Practical

- Internal Assessment (30)
- PracticalEndSemesterExaminationwillconsistof70MarksExam.i.eLongcase (30)Short case (20) Viva (15) Journal(05)

Course Code: BPT310

Course Name: **COOMUNICATION SKILL I**

Prerequisite Course/s:

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical/Clinical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
-	02	02	2	20	30	-	-	50	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Outcomes: At the end of the course students shall be able to

CO1	Apply principles of effective communication in interpersonal and professional contexts.
CO2	Demonstrate listening skills and comprehend spoken English in formal and informal settings.
C03	Construct grammatically correct sentences and organize ideas in written communication.
C04	Develop confidence in public speaking and presentations.

Unit	Content	Credit	Weightage

I	**Foundations of Communication**
	Topics:
	• **Introduction to Communication**
	  o Process, types (verbal, non-verbal), barriers, and principles of effective communication.
	• **Listening Skills**
	  o Types of listening, barriers, active listening techniques.
	• **Grammar and Vocabulary Building**
	  o Tenses, articles, prepositions, common errors.
	  o Word formation, synonyms, antonyms, contextual vocabulary.
	• **Reading Comprehension**
	  o Skimming, scanning, inferring meaning from texts.
	• **Spoken English Basics**
	  o Pronunciation, intonation, everyday conversations.
		1	50%

II	**Applied and Professional Communication Topics:**
	• **Professional Writing**
	  o Emails, memos, notices, formal letters.
	• **Presentation Skills**
	  o Structure, body language, visual aids, handling Q&A.
	• **Group Discussion and Public Speaking**
	  o Techniques, coherence, persuasion, and fluency.
	• **Digital Communication Tools**
	  o Online meeting etiquette, collaborative platforms, netiquette.
	• **Introduction to Soft Skills**
	  o Teamwork, time management, interpersonal skills.
		1	50%

Textbooks:

- *Technical Communication* by Meenakshi Raman & Sangeeta Sharma (Oxford).

Reference books:

- *Communication Skills* by Sanjay Kumar & Pushp Lata (Oxford).
- *English for Engineers* by C. Muralikrishna & Sunita Mishra (Cambridge).
- *Essential Grammar in Use* by Raymond Murphy.

Online Platforms:

1. Grammar & Writing:
   - Grammarly, Purdue OWL, British Council Learn English.
2. Speaking & Listening:
   - BBC Learning English, TED Talks, Coursera (Communication Courses).
3. Collaboration & Presentations:
   - Google Workspace (Docs, Slides), Canva, Zoom/Teams for practice.
4. Self-Assessment:
   - Kahoot! (quizzes), Duolingo English Test, YouTube channels for pronunciation

COURSE CODE: BPT311

COURSE NAME: ENVIRONMENTAL SCIENCE

Teaching & Examination Scheme:

Teaching Scheme (Hours/Week)				Examination Scheme (Marks)					
Theory	Practical/Clinical	Total	Credit	Theory		Practical		Total	Remarks
				CE	ESE	CE	ESE		
02	-	02	2	20	30	-	-	50	

CE: Continuous Evaluation, ESE: End Semester Exam

Course Objectives:

- To provide a foundational understanding of environmental systems and interrelationships.
- To develop critical awareness of local and global environmental challenges.
- To promote sustainable thinking and problem-solving skills.
- To encourage active citizenship and participation in environmental conservation.
- To integrate technology and digital tools in environmental learning and advocacy.

Course Outcomes: At the end of the course students shall be able to

CO1	Explain core environmental concepts, ecosystems, biodiversity, and natural resource systems.
CO2	Analyze causes and impacts of environmental issues such as pollution, climate change, and waste management.
C03	Evaluate sustainable development practices and their role in environmental conservation.
C04	Demonstrate environmental responsibility through individual and community actions.

Unit	Content	Credit	Weightage
I	**Environmental Systems and Issues** **Topics:** 1. **Introduction to Environment and Ecology**	1	50%

	- Multidisciplinary nature, scope, and importance of environmental studies. - Ecosystems: Structure, function, energy flow, and ecological succession. 2. **Natural Resources and Biodiversity** - Types of resources (water, forest, mineral, energy), sustainable use and management. - Biodiversity: Levels, threats, conservation strategies (in-situ and ex-situ). 3. **Environmental Pollution and Health** - Air, water, soil, noise, and thermal pollution: sources, effects, and control measures. - Solid and e-waste management: principles of reduce, reuse, recycle. 4. **Climate Change and Global Environmental Issues** - Greenhouse effect, global warming, ozone depletion, and acid rain. - International agreements: UNFCCC, Paris Agreement, Kyoto Protocol.		
II	**Sustainability, Policy, and Action Topics:** 1. **Sustainable Development** - Concept, pillars (environmental, social, economic), and sustainable development goals (SDGs). - Green technologies, renewable energy, and circular economy. 2. **Environmental Governance and Ethics** - Indian environmental laws: Environment Protection Act, Wildlife Protection Act, etc. - Environmental ethics, equity, and the role of public participation. 3. **Human Communities and Environment** - Population growth, urbanization, and environmental impact.	1	50%

- Environmental movements (e.g., Chipko, Narmada Bachao).

4.Tools for Environmental Management

- Environmental impact assessment (EIA), remote sensing, GIS applications.
- Carbon footprint calculation, sustainability auditing, and green budgeting.

Textbooks:

- *Environmental Studies: From Crisis to Cure* by R. Rajagopalan (Oxford University Press).

Reference books:

- *Textbook of Environmental Studies for Undergraduate Courses* by Erach Bharucha (UGC prescribed).
- *Environmental Science: Earth as a Living Planet* by Botkin & Keller (Wiley).
- *Our Environment* by R. C. Das & M. Behera (NEP-aligned edition).

Online Platforms:

- SWAYAM / NPTEL courses on Environmental Science.
- Coursera: "Introduction to Sustainability" (University of Illinois).

SEMESTER IV