



**Faculty of Medical, Paramedical
&
Allied Health Sciences**

Syllabus

For

**Bachelor of Physiotherapy
(B.P.T.)**

***(Program Code: HS0141)
(2019-20)***

(Approved by the Academic Council vide Resolution No. 34.26 dated 20.06.2019)

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1. Program Educational Objectives (PEOs)

After successful completion of the program, the graduates will be

PEO1: Able to integrate theoretical knowledge with clinical assessment.

PEO2: Able to develop effective communication with patients, family, colleagues and students.

PEO3: Able to actively engage in lifelong learning activities.

2. Graduate Attributes (GAs)

The graduate attributes in BPT are the summation of the expected course learning outcomes mentioned in the end of each course. Some of them are stated below. These learning goals for BPT are divided into nine key areas:

GA1. Role of physiotherapy: To recognize the role of Physiotherapy in the context of the health needs of the community and National priorities in the health sector. Using a patient/family-centered approach and best evidence, each student will organize and implement the preventive, investigative and management plans; and will offer appropriate follow-up services. Program objectives should enable the students to:

- Apply the principles of basic science and evidence-based practice
- Use relevant investigations as needed.
- Identify the ailments and as per the indications for basic procedures, perform them in an appropriate and ethical way.
- Provide care to patients – efficiently and in a cost-effective way – in a range of settings, and maintain foremost the interests of individual patients.
- Identify the influence of biological, psychosocial, economic, and spiritual factors on patients' well-being and act in an appropriate manner.

GA2. Ethics: Demonstrate professional and ethical behavior appropriate to at least the minimum standard expected for a Physiotherapy Graduate. Students will understand core concepts of clinical ethics and law so that they may apply these to their practice as Physical Therapists. Program objectives should enable the students to:

- Describe and apply the basic concepts of clinical ethics to actual cases and situations
- Recognize the need to make health care resources available to patients fairly, equitably and without bias, discrimination or undue influence.
- Demonstrate an understanding and application of basic legal concepts to the practice of physiotherapy.
- Employ professional accountability for the initiation, maintenance and termination of patient-provider relationships.
- Demonstrate respect for each patient's individual rights of autonomy, privacy, and confidentiality.

GA3. Acquire knowledge: The student will execute professionalism to reflect in his/her thought and action a range of attributes and characteristics that include technical competence, appearance, image, confidence level, empathy, compassion, understanding, patience, manners, verbal and non-verbal communication, an anti-discriminatory and non-judgmental attitude, and appropriate physical contact to ensure safe, effective and expected delivery of healthcare. Program objectives will aim at making the students being able to:

- (i) Demonstrate distinctive, meritorious and high quality practice that leads to excellence and that depicts commitment to competence, standards, ethical principles and values, within the legal boundaries of practice
- (ii) Demonstrate the quality of being answerable for all actions and omissions to all, including service users, peers, employers, standard-setting/regulatory bodies or oneself
- (iii) Demonstrate humanity in the course of everyday practice by virtue of having respect (and dignity), compassion, empathy, honor and integrity
- (iv) Ensure that self-interest does not influence actions or omissions, and demonstrate regards for service-users and colleagues.

GA4. Assessment and Diagnosis : Ability to perform a safe, systematic and appropriate physiotherapy assessment for various conditions and to analyze and interpret physical assessment and diagnosis and set appropriate short and long term goals. The student will utilize sound scientific and/or scholarly principles during interactions with patients and peers, educational endeavors, research activities and in all other aspects of their professional lives. Program objectives should enable the students to:

- Engage in ongoing self-assessment and structure their continuing professional education to address the specific needs of the population.
- Practice evidence-based practice by applying principles of scientific methods.
- Acquire basic skills such as presentation skills, giving feedback, patient education and the design and dissemination of research knowledge; for their application to teaching encounter

GA5. Problem analysis: Function effectively in identification and analysis of the problem

- Identification of "Red flags" or areas that require action.
- Anticipation of potential problems based on finding.
- Scanning entries to identify areas of need.
- Range of knowledge for research and diagnosing skills shall be inculcated by the students in order to give a directed treatment approach

GA6. Short-term and Long-term Goal setting: Function effectively as an individual and as a member or leader in multidisciplinary rehabilitation facility. The student will lead a high value on effective communication within the team, including transparency about aims, decisions, uncertainty and mistakes. Team-based health care is the provision of health services to individuals, families, and/or their communities by at least two health providers who work collaboratively to accomplish shared goals within and across settings to achieve coordinated, high quality care. Program objectives will aim at making the students being able to:

- Recognize, clearly articulate, understand and support shared goals in the team that reflect patient and family priorities.
- Possess distinct roles within the team; to have clear expectations for each member's functions, responsibilities, and accountabilities, which in turn optimizes the team's efficiency and makes it possible for them to use division of health services advantageously, and accomplish more than the sum of its parts.

GA7.Documentaion: Able to document the problem properly for necessary interventions.

- Develop mutual trust within the team to create strong norms of reciprocity and greater opportunities for shared achievement.
- Communicate effectively so that the team prioritizes and continuously refines its communication channels creating an environment of general and specific understanding.
- Recognize measurable processes and outcomes, so that the individual and team can agree on and implement reliable and timely feedback on successes and failures in both the team's functioning and the achievement of their goals. These can then be used to track and improve performance immediately and over time.

GA8. Communication: Communicate effectively across wide range of professional and personal contexts. The student will learn how to communicate with patients/clients, care-givers, other health professionals and other members of the community effectively and also with the peers appropriately. Communication is a fundamental requirement in the provision of health care services. Program objectives should enable the students to:

- Provide sufficient information to ensure that the patient/client can participate as actively as possible and respond appropriately to the information.
- Clearly discuss the diagnosis with the patient, and decide appropriate treatment plans in a sensitive manner that is in the patient's and society's best interests.
- Explain the proposed healthcare service – its nature, purpose, possible positive and adverse consequences, its limitations, and reasonable alternatives wherever they exist.
- Use effective communication skills to gather data and share information including attentive listening, open-ended inquiry, empathy and clarification to ensure understanding
- Appropriately communicate with, and provide relevant information to, other stakeholders including members of the healthcare team
- Use communication effectively and flexibly in a manner that is appropriate for the reader or listener.
- Explore and consider the patient's ideas, beliefs and expectations during interactions with them, along with varying factors such as age, ethnicity, culture and socioeconomic background.
- Develop efficient techniques for all forms of written and verbal communication including accurate and timely record keeping
- Assess their own communication skills, develop self-awareness and be able to improve their relationships with others.
- Possess skills to counsel for lifestyle changes and advocate health promotion

GA9 Research activities: Ability to choose, demonstrate intervention safely and document the progression appropriately and also able to understand and conduct research activities.

- Incorporate the Research learning process either by introducing research and data oriented protocols of learning practices in curriculum or by introduction to research process via evidence based practice.
- Imbibe the system of data restoration in order for future patient oriented researches and for better outcome of results and treatment for the future perspectives.
- Develop the system of research projects in undergraduate program by keeping in mind the need of the society and for their betterment.

GA10. The Physiotherapist and society: Engage in activities that contribute to the betterment of society and behave ethically and responsible in social environment-. The students will recognize that allied and healthcare professionals need to be advocates within the health care system, to judiciously manage resources and to acknowledge their social accountability. They have a mandate to serve the community, region and the nation and will hence direct all research and service activities towards addressing their priority health concerns. Program objectives should enable the students to:

- Demonstrate knowledge of the determinants of health at local, regional and national levels and respond to the population needs.
- Establish and promote innovative practice patterns by providing evidence-based care and testing new models of practice that will translate the results of research into practice, and thus meet individual and community needs in a more effective manner.
- Develop a shared vision of an evolving and sustainable health care system for the future by working in collaboration with and reinforcing partnerships with other stakeholders, including academic health centers, governments, communities and other relevant professional and non-professional organizations.
- Advocate for the services and resources needed for optimal patient care.

3. Programme Outcomes (POs)

The aim of the course is to provide comprehensive, individually focused training that prepares the students for providing a quality physiotherapy care to the patients so that at the end of the course he/she will be able to perform the following:

- PO1.** Recognize the role of Physiotherapy in the context of the health needs of the community and National priorities in the health sector.
- PO2.** Demonstrate professional and ethical behavior appropriate to at least the minimum standard expected for a Physiotherapy Graduate.
- PO3.** Ability to acquire knowledge on Basic Medical sciences, Human Movement Sciences, Various Medical Conditions and Surgical treatments to identify Psychological, Social, Economical, Cultural aspects of diseases and its impact on community.
- PO4.** Ability to practice a safe, systematic and appropriate physiotherapy assessment for various conditions.
- PO5.** Identify, Define and Deal with problems of professional practice through logical, analytical and critical thinking.

- PO6.** Ability to analyze and interpret physical assessment and diagnosis and set appropriate short and long term goals.
- PO7.** Ability to choose, demonstrate intervention safely and document the progression appropriately.
- PO8.** Communicate effectively across wide range of professional and personal contexts.
- PO9.** Ability to understand and conduct research activities.
- PO10.** Engage in group activities that contribute to the betterment of society and behave ethically and responsible in social environment.

Mapping of Graduate Attributes (GAs) and Programme Outcomes (POs):

	GA1	GA2	GA3	GA4	GA5	GA6	GA7	GA8	GA9	GA10
PO1										
PO2										
PO3										
PO4										
PO5										
PO6										
PO7										
PO8										
PO9										
PO10										

4. Programme Specific Outcomes (PSOs)

- PSO1:** Promotion of health and education by the means of improved quality of life through the practice of the profession and also by working effectively in various inter professional collaborative settings like multi, super specialty hospitals, Rehabilitation Centres, Special Schools, Educational Institutions, Health and Fitness Centers, Geriatric Centers, Ergonomic Consultant in Corporate Sectors, Private Consultation, Home Care Services, Industrial Sectors, Sports Management, Fitness Consultant
- PSO2:** Develop the ability to collect history, perform relevant clinical assessment, diagnose, investigate and frame appropriate treatment strategies by incorporating electrotherapeutic modalities, exercise therapy techniques, manual therapy, manipulations and others means of management for the patients.

5. Course-Wise Learning Objectives, Structures and Outcomes (CLOSOs)

Course learning outcomes of each course in BPT have been enshrined in the end of course contents of each course with their objectives those are in the beginning of the every course.

Course Structure (BPT)

BPT 1ST Year

Code No.	Paper	Type	THEORY			PRACTICAL			L	T/P	Credits
			Total Marks	Internal Marks	External Marks	Total Marks	Internal Marks	External Marks			
BPT 101	ANATOMY	Core	100	30	70	100	30	70	4x2=8	2x2=4	12
BPT 102	PHYSIOLOGY	Core	100	30	70	100	30	70	4x2=8	2x2=4	12
BPT 103(A)	BIO-CHEMISTRY	ELECTIVE	100	30	70	-	-	-	3x2=6	-	6
BPT 103(B)	ENVIRONMENTAL SCIENCE	ELECTIVE	100	30	70	-	-	-	3x2=6	-	6
BPT104	SOCIOLOGY	AEC	100	30	70	-	-	-	3x2=6	-	6
BPT 105	GENERAL & CLINICAL PSYCHOLOGY	Core	100	30	70	-	-	-	3x2=6	-	6
BPT 106	BASIC PRINCIPLES IN PHYSIOTHERAPY	Core	100	30	70	100	30	70	3x2=6	2x2=4	10
BPT 107	ENGLISH COMMUNICATION	AEC	100	30	70	-	-	-	2X2=4	-	4
Total									44	12	56

Yearly credits have been calculated by multiplying the semester-wise teaching hours by two.

BPT 2ND Year

Code No.	Paper	Type	THEORY			PRACTICAL			L	T/P	Credits
			Total Marks	Internal Marks	External Marks	Total Marks	Internal Marks	External Marks			
BPT 201	PATHOLOGY & MICRO-BIOLOGY	Core	100	30	70	-	-	-	4x2=8	-	8
BPT 202	PHARMACOLOGY	Core	100	30	70	-	-	-	3x2=6	-	6
BPT 203	BIO-MECHANICS	SEC	100	30	70	100	30	70	4x2=8	2x2=4	10
BPT 204	EXERCISE THERAPY	Core	100	30	70	100	30	70	4x2=8	2x2=4	10
BPT 205	ELECTRO THERAPY	Core	100	30	70	100	30	70	4x2=8	2x2=4	10
BPT 206(A)	ETHICS AND LAW IN PHYSIOTHERAPY	ELECTIVE	100	30	70	-	-	-	3x2=6	-	6
BPT 206(B)	COMPUTER SCIENCE	ELECTIVE	100	30	70	-	-	-	3x2=6	-	6
Total									44	12	50

Yearly credits have been calculated by multiplying the semester-wise teaching hours by two.

BPT 3rd Year

Code No.	Paper	Type	THEORY			PRACTICAL			L	T/P	Credits
			Total Marks	Internal Marks	External Marks	Total Marks	Internal Marks	External Marks			
BPT 301	GENERAL MEDICINE	Core	100	30	70	-	-	-	4X2=8	-	8
BPT 302	GENERAL SURGERY AND OBSTETRICS & GYNAECOLOGY	Core	100	30	70	-	-	-	4X2=8	-	8
BPT 303	CLINICAL ORTHOPEDICS	Core	100	30	70	-	-	-	4X2=8	-	8
BPT 304	CLINICAL NEUROLOGY & PAEDIATRICS	Core	100	30	70	-	-	-	4X2=8	-	8
BPT305	RESEARCH METHODOLOGY & BIO-STATISTICS	Core	100	30	70	-	-	-	3X2=6	-	6
BPT 306(A)	COMMUNITY MEDICINE	ELECTIVE	100	30	70	-	-	-	3X2=6	-	6
BPT 306(B)	BIOENGINEERING	ELECTIVE	100	30	70	-	-	-	3X2=6	-	6
BPT 307	SUPERVISED CLINICAL TRAINING	Core	-	-	-	100	30	70	-	2X2=4	2
	Total								44	4	46

Yearly credits have been calculated by multiplying the semester-wise teaching hours by two.

BPT 4th Year

Code No.	Paper	Type	THEORY			PRACTICAL			L	T/P	Credits
			Total Marks	Internal Marks	External Marks	Total Marks	Internal Marks	External Marks			
BPT 401	PHYSIOTHERAPEUTIC IN ORTHOPAEDIC CONDITIONS	Core	100	30	70	100	30	70	4X2=8	2X2=4	10
BPT 402	PHYSIOTHERAPEUTIC IN NEUROLOGICAL CONDITIONS	Core	100	30	70	100	30	70	4X2=8	2X2=4	10
BPT 403	PHYSIOTHERAPY IN GEN. MEDICINE & SURGICAL CONDITION	Core	100	30	70	100	30	70	4X2=8	2X2=4	10
BPT 404	PHYSIOTHERAPY IN CARDIOTHORACIC CONDITIONS	Core	100	30	70	100	30	70	4X2=8	2X2=4	10
BPT 405(A)	RATIONALE OF REHABILITATION	ELECTIVE	100	30	70	100	30	70	3X2=6	2X2=4	8
BPT 405(B)	FIRST AID	ELECTIVE	100	30	70	-	-	-	3x2=6	-	6
BPT 406	MINOR PROJECT & CLINICAL TRAINING	Core	-	-	-	100	30	70	-	3X2=6	3
Total									38	26	51

6 MONTHS (180 DAYS) COMPULSORY CLINICAL INTERENSHIP & PROJECT (MAJOR) SUBMISSION

Code No.	Paper	Type	THEORY			PRACTICAL			L	T/P	Credits
			Total Marks	Internal Marks	External Marks	Total Marks	Internal Marks	External Marks			
BPT 501	CLINICAL INTERENSHIP & PROJECT	Core	-	-	-	100	30	70	-	24	24

Maximum & minimum credits of the program

The total number of the credits of the BPT Programmes is 260

B.P.T. 1ST YEAR

FIRST YEAR BACHELOR OF PHYSIOTHERAPY (1 YEAR DURATION)

ANATOMY

CODE-BPT101

Course objectives

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

General anatomy: Unit -I

Cell	Parts, Name of Cytoplasm organelles and inclusion with their function
Epithelium	Types with example and light microscopic structure.
Connective Tissue	Classification with emphasis on tendon
Cartilage	Types with example
Bone	Types with example, type of ossification (Stage of ossification not required) blood supply, fracture repair.
Joints	Classification with example, emphasis on synovial joint.
Muscles	Types & Structure & Functions
Nervous Tissue	Structure of a neuron, synapse reflex arc, degeneration and regeneration of the nerve.
Embryology	(a) Ovum, spermatozoa, fertilization of the germ layers and their derivation. (b) Development of skin, fascia, blood vessels, lymph. (c) Development of bones, axial and appendicular skeleton and muscles. (d) Neural tube, brain vessels & spinal cord. (e) Development of brain (brain stem) structures.

REGIONAL ANATOMY

UPPER EXTREMITY: Unit-II

Theory

Axilla, brachial plexus, shoulder joints, sternoclavicular joints, axillary lymph nodes, elbow joints, superior radioulnar joints, nerves of arm and fore arm, Ulnar nerve in hand, cutaneous distribution according to dermatomes, clinical anatomy, surface anatomy.

Practical / Demonstration

Pectoral region, axilla, scapula and clavicle, humerus, muscles of arm (front & back), radius front of forearm, muscles of palm and arterial arches, articulated hand (carpals and metacarpals, name and arrangements in order only)

LOWER EXTREMITY: Unit-III**Theory**

Lumbar plexus, inguinal group of lymph nodes, hip joint, femoral triangle and femoral sheath, knee joint, venous drainage of inferior extremity, sciatic nerve and its distribution, obturator nerve, arches of foot, midtarsal joint. Cutaneous distribution according to myotome, clinical anatomy, surface markings.

Practical / Demonstration

Hip bone, Glutei Muscles, Femur, front of thigh, back of thigh medial side of thigh, Tibia, Anterior compartment of leg, Fibula, Lateral compartment leg, back of leg, Articulated foot (identification of tarsal and meta tarsal only).

Abdomen and pelvis**Theory**

Abdominal wall, Inguinal canal, stomach, Liver, pancreas, kidney with ureter and spleen, small Intestine, Large Intestine, Abdominal Aorta, Portal vein, Diaphragm. Sacral plexus, Sacroiliac joint, Intervertebral disc.

Practical / Demonstration

Abdominal viscera, Sacrum, Bony pelvis, Viscera of Pelvis and Blood Vessels.

THORAX : Unit -IV**Theory**

Thoracic cage and Mediastinum, Heart with its internal and external features Bloods vessels, typical spinal Nerve, Typical Intercostals space, Mechanism of Respiration, Surface marking of Heart and Lungs.

Practical / Demonstration

Superior mediastinal structures, Sternum, Ribs (only general features), Vertebrae (identification, general features, functional components, Development, vertebral column with weight transmission), Heart, pleura & lungs.

HEAD & NECK: Unit -V**Theory**

Temporomandibular joint, Atlantoccipital and Atlantoaxial Joint, Cutaneous distribution of trigeminal Nerve.

Practical / Demonstration

Mouth cavity, Nasal cavity pharynx and Larynx (parts, sensory distribution), Cranial bones (identification of Individual born general features, different foramina in relation to cranial fossae and their relations to brain and Hypophysis).

Identification of Anterior and Posterior triangle of Neck with their contents.

Radiological Anatomy of Musculoskeletal System.

NERVOUS SYSTEM

Theory

General Introduction and classification, Autonomic Nervous system (Idea about Sympathetic and Para sympathetic with their difference in distribution and function). Spinal cord with its Meaning, spinal Reflex, Pyramidal and Extrapyramidal tracts (Detail Nucleus not required) Blood supply. Parts of brain, meanings, Gross discussion of hindbrain, Mid Brain (cranial Nerve Nucleus Position should be mentioned) Fore brain – Cerebral hemisphere, functional areas and blood supply.

Practical / Demonstration

Spinal cord and parts of brain.

CRANIAL NERVES

Name in order, Individual cranial Nerve distribution. Idea about upper Motor Neuron and Lower Motor Neuron, applied anatomy.

HISTOLOGY PRACTICAL

Epithelium (Simple, Compound)

Connective tissue (Cartilage & Bone)

Muscle (smooth & skeletal)

Nervous tissue (Neuron)

Blood vessels (Large artery and vein)

BOOK REFERENCES:-

1. Grays Anatomy
2. Human Anatomy- Snell
3. Anatomy – BD Chourasiya, Volume-I,II, & II
4. Human Anatomy – Kadasemn Volume –I , II & III
5. Human Anatomy- Dutta

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Understand & identify all gross anatomical structures, particular emphasis will be placed on description of bones, joints, muscles, brain, cardio-pulmonary and nervous systems as these are related to the application of Physiotherapy	L2
CO2	Demonstrate knowledge in human anatomy as in necessary for the study and practice of physiotherapy	L3
CO3	Apply information gained about human health and medical research as to its social, environmental, and ethical implications as part of being a responsible citizen	L3
CO4	Use scientific laboratory equipment in order to gather and analyze data on human anatomy	L4
CO5	Implement the gross anatomy knowledge while treating the patients.	L3

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PS01	PS02
CO1	L2	H	M	H	L	-	-	L	M	L	-	-	-
CO2	L3	H	H	M	H	M	M	M	M	-	L	-	-
CO3	L3	M	H	L	M	M	M	M	M	-	L	-	-
CO4	L4	L	-	M	M	H	M	M	M	-	L	-	-
CO5	L3	M	-	H	L	L	-	-	M	-	L	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER –PHYSIOLOGY

CODE-BPT102

COURSE OBJECTIVE-

- Define homeostasis and explain how homeostatic mechanisms normally maintain a constant interior milieu.
- State the functions of each organ system of the body, explain the mechanisms by which each functions, and relate the functions and the anatomy and histology of each organ system.
- Understand and demonstrate the interrelations of the organ systems to each other.
- Predict and explain the integrated responses of the organ systems of the body to physiological and pathological stresses.
- Explain the patho physiology of common diseases related to the organ systems of the body.

GENERAL PHYSIOLOGY: Unit-I

1. Introduction and scope of Physiology.
2. Cell and tissue – its structure, principal constituents, properties and function including cell division.
3. Body fluid.
Blood: composition and general function of plasma. Blood cells – structure and function – Red blood cell, white blood cell – including number and approximate length of life – position structure and function of cell of reticulo-endothelial system.
Blood clotting including bleeding time and clotting time, factors accelerating or slowing the process. Blood groups and their significance, Rh- factor, Hemoglobin and E.S.R.
Formation of blood, tissue fluid and lymph.

CardioVascular System and Respiratory System Physiology:Unit-II

1. Cardiovascular System.
Structure and properties of Heart Muscles and nerve supply of Heart.
Structure and function of arteries, capillaries and veins.
Cardiac cycle and Heart sound.
Cardiac output measurements, factors affecting Heart Rate and its regulation,
Cardiac – vascular reflexes.
Bloods pressure, its regulation, physiological variation, peripheral resistance, Factors controlling blood pressure, Hemorrhage.
ECG study. Stress and stress test.
2. Respiratory System.
Mechanism of Respiration, change in diameters of thorax – intra-pleural and intra-pulmonary pressure.
Quantities of lung volume, tidal and residual volume, vital capacity.
Gaseous inter-changes in lung and tissues.
Control of respiration – Nervous and chemical significance of change in rate and depth, transportation of oxygen and carbon-dioxide.
Respiratory states – anoxia, asphyxia, cyanosis, acclimatization.

Physiology of Digestive Tract and Reproductive system: Unit -III

1. Digestive System
General arrangements of alimentary canal, liver pancreas – position, structure and functions.
Nutrition and diet – carbohydrates, protein, fat, salt, water, vitamins and minerals digestion, Absorption and Metabolism.
2. System.
Sex determination and development of puberty, male sex hormones, spermatogenesis, female sex hormones, menstrual cycle. Ovulation, pregnancy, Function of placenta, location.
3. Excretory System.
Gross and minute structure of kidney, renal circulation, Mechanism of formation of urine, Glomerular rate and tubular function, renal function and renal test. Physiology of micturition.

Physiology of Thyroid and Skin: Unit-IV

1. Endocrine System.
Structure and function of pituitary (anterior & posterior). Thyroid, Parathyroid, adrenal cortex, adrenal medulla, Thymus and pancreas.
Blood sugar regulation.
2. Skin – Structure and functions.

NEUROMUSCULAR PHYSIOLOGY: Unit-V

1. Cell membrane – ionic and potential gradient and transport.
2. Muscle – Types of muscular tissue – Gross and microscopic structure – function, Basis of Muscle contraction – change in muscle contraction, Electrical – Biphasic and monophasic action potentials, chemical, Thermal and physical change, Isometric and Isotonic contraction.
Motor units and its properties – clonus, tetanus, all or none law, Fatigue.
Nerve – Gross and microscopic structure of nervous tissue, one neuron – Generation of action potential – Nerve impulse – condition.
Neuromuscular junction.
Degeneration – Regeneration of peripheral nerves Wallerian degeneration, electro tonus and pflafgers law.
Types and properties, of receptions, types of sensation, synapse, reflex, are its properties occlusion, summation, sub minimal fatigue ext.
Tracts – Ascending and descending and extra pyramidal tracts.
Function of E.E.G.
Function of Cerebral cortex, cerebrum, cerebellum, Basal ganglia,
Thalamus – connection and functions.
Reticular formation – tone, posture & equilibrium, autonomic nervous system.
Special Senses Eye – Error of refraction, lesions of visual path ways.
Speech and its disorder.
Ear and vestibular apparatus, test, olfactory, somatic sensations.

PRACTICAL PHYSIOLOGY/ DEMONSTRATION

1. Hematology: - RBC counts, WBC count, different count ESR, Bleeding & Clotting time, Estimation of hemoglobin, Blood groups.
2. Human physiology: - Examination of (a) Respiratory system (b) heart and arterial pulse (c) deep and superficial reflexes (d) cranial nerves (e) motor system. (f) Sensory system including higher function (g) measurement of blood pressure.
3. Effect of exercises on body physiology.

Book Reference:-

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

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Understand the basis of normal human physiology with special emphasis on the functioning of the cardiovascular, musculo-skeletal and nervous systems.	L2
CO2	Explain the role of body systems and mechanisms in maintaining homeostasis	L2
CO3	Understand how abnormal Physiology affects human function and dysfunction of the human body.	L2
CO4	Evaluate Breath sounds, Blood pressure, Respiratory rate, Heart rate and Pulmonary Function Tests	L4
CO5	Demonstrate an understanding of elementary human physiology and Bio-Chemistry	L3

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L2	H	M	H	L	L	L	M	M	L	-	-	-
CO2	L2	H	L	H	M	L	L	-	M	L	-	-	-
CO3	L2	H	-	H	M	L	-	-	M	L	L	-	-
CO4	L3	M	H	M	H	M	M	M	M	L	-	-	-
CO5	L3	M	M	M	L	M	M	M	M	L	L	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER - BIOCHEMISTRY

CODE-BPT103(A)

CODE: BPT103

COURSE OBJECTIVES:

- To understand the biochemical basis of life sciences.
- To understand the different lab tests and test significances.
- To understand the biological and biochemical processes.

BIO – PHYSICS and Cell Chemistry Unit-I

Concepts of PH and buffer, Acid – base equilibrium, osmotic pressure and its physiological applications. Morphology, structure and function of cell, cell membrane, Nucleus, Chromatin, Mitochondria reticulum, Ribosome.

CARBOHYDRATES, LIPIDS, PROTEINES & METABOLISM: Unit-II

Definition, Function, Source, classification, & metabolism.

VITAMINS :Unit-III

Classification, Fat soluble vitamins – A, D, E, K, Water soluble vitamins –B Complex and Vitamin C. Daily requirement, physiological functions and diseases of vitamin deficiency

WATER AND ELECTROLYTES & MINERALS Metabolism Process:

Unit-IV

Fluid compartment, Daily intake and output, Dehydration, sodium and potassium Metabolism.

MINERAL METABOLISM & HORMONES: Unit- V

Iron, Calcium, Phosphorous, Trace elements.

General Characteristic and Mechanism of Hormone actions.

Reference Books -

1. Text Book of Biochemistry by Harbanslal
2. Essentials of medical biochemistry by R.C. Gupta
3. Harper's Illustrated Biochemistry by Murry et.al.26 Ed.
4. Text Book of Biochemistry by D.M. Vasudevan and sreekumari S. 4th Ed.
5. Biochemistry by U. Satyanarayana II Ed.

B.P.T. 1ST YEAR

PAPER ENVIRONMENTAL SCIENCE

CODE-BPT103 (B)

THEORY---70

Unit-I: Fundamentals of Environmental Sciences

- Definition, Principles and Scope of Environmental Science. Structure and composition of atmosphere, hydrosphere, lithosphere and biosphere.
- Laws of thermodynamics, heat transfer processes, mass and energy transfer across various interfaces, material balance.
- Meteorological parameters - pressure, temperature, precipitation, humidity, mixing ratio, saturation mixing ratio, radiation and wind velocity, adiabatic lapse rate, environmental lapse rate. Wind roses. Interaction between Earth, Man and Environment.

Unit-II: Environmental Chemistry

- Fundamentals of Environmental Chemistry: Classification of elements, Stoichiometry, Gibbs' energy, chemical potential, chemical kinetics, chemical equilibria, solubility of gases in water, the carbonate system, unsaturated and saturated hydrocarbons, radioisotopes. Composition of air.
- Particles, ions and radicals in the atmosphere. Chemical speciation. Chemical processes in the formation of inorganic and organic particulate matters, thermochemical and photochemical reactions in the atmosphere, Oxygen and Ozone chemistry.

Unit-III: Environmental Biology

- Ecology as an inter-disciplinary science. Origin of life and speciation. Human Ecology and Settlement.
- Ecosystem Structure and functions: Structures - Biotic and Abiotic components. Functions - Energy flow in ecosystems, energy flow models, food chains and food webs. Biogeochemical cycles, Ecological succession. Species diversity, Concept of ecotone, edge effects, ecological habitats and niche.

Unit-IV: Environmental Geosciences

- Distribution of water in earth, hydrology and hydrogeology, major basins and groundwater provinces of India, Darcy's law and its validity, groundwater fluctuations, hydraulic conductivity, groundwater tracers, land subsidence, effects of excessive use of groundwater, groundwater quality. Pollution of groundwater resources, Ghyben-Herzberg relation between fresh-saline water.
- Natural resource exploration and exploitation and related environmental concerns. Historical perspective and conservation of non-renewable resources.
- Natural Hazards: Catastrophic geological hazards - floods, landslides, earthquakes, volcanism, avalanche, tsunami and cloud bursts. Prediction of hazards and mitigation of their impacts.

Unit-V: Energy and Environment

- Sun as source of energy; solar radiation and its spectral characteristics. Fossil fuels: classification, composition, physico-chemical characteristics and energy content of coal, petroleum and natural gas. Shale oil, Coal bed Methane, Gas hydrates. Gross-calorific value and net-calorific value.
- Principles of generation of hydro-power, tidal energy, ocean thermal energy conversion, wind power, geothermal energy, solar energy (solar collectors, photo-voltaic modules, solar ponds).
- Nuclear energy - fission and fusion, Nuclear fuels, Nuclear reactor – principles and types.

Bioenergy: methods to produce energy from biomass.

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Demonstrate comprehensive understanding of biochemistry	L2
CO2	Acquire the knowledge in biochemistry that are required to be practiced in community and at all levels of health care system	L1
CO3	Understand relevant investigations which will help to know about the important medical conditions.	L2
CO4	Identify various nutritional disorders in physiotherapeutic system of medicine	L3
CO5	Interpret the common clinical biochemistry investigations report of patients in clinics and Hospitals.	L4

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L2	H	L	L	-	-	L	-	M	L	L	-	-
CO2	L1	M	M	H	L	-	-	-	M	L	M	-	-
CO3	L2	M	L	H	H	M	H	-	M	L	M	-	-
CO4	L3	M	L	H	M	H	M	-	M	L	L	-	-
CO5	L4	H	H	H	M	H	H	M	M	L	H	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER - SOCIOLOGY

CODE: BPT 104

COURSE OBJECTIVES:

- To introduce students to the basic social processes of society, social institutions and patterns of social behavior.
- To train students to understand and to interpret objectively the role of social processes, social institutions and social interactions in their lives.
- Engage in activities that contribute to the betterment of society and behave ethically and responsibly in social environment.

A. Introduction :UNIT-I

Definition of sociology. Sociology as a science, uses of study of Sociology, application of knowledge of sociology in Occupation Therapy.

B. Sociology and health :UNIT-II

Social factors affecting health status, health determinants, issues of right to health, social consciousness and perception of illness, social consciousness and meaning of illness, decision making in taking treatment. Institution of health their role in the improvement of health and the people.

C. Socialization & Social Groups: UNIT-III

Meaning of socialization, gender, relationship between gender and society, influence of social factors on personality, socialization in hospital and socialization in rehabilitation of patients.

Social groups

Concepts of social group & influence of formal and informal groups on health and sickness, the role of primary groups and secondary group in the hospital and rehabilitation setting

D. Family: UNIT-IV

Influence of family on human personality, discussion of changes in the function of a family, influence of family on the individual's family and psychosomatic disease, human values.

E. Social problems of the disabled: UNIT-V

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

Population explosion

Poverty and unemployment

Beggary

Juvenile delinquency

Prostitution

Alcoholism

Problems of women in employment

Books Recommended:

1. Introduction to psychology- Mums- I.D.P. Co.
2. Foundation of psychology- Weld- Publishing house, Bombay.
3. Introduction to social psychology- Akolkar- Oxford publishing house.
4. Psychology and sociology – Applied to Medicine – Porter & Alder – W.B.Saunders.
5. Behavioral Science for Medical - undergraduates –Manju Mehta – Jaypee Brothers
6. Elementary Psychology –Mohsin Moti Lal Banarsi Dass, Delhi.

CO	STATEMENTS (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Explains the role of sociology and its application	L2
CO2	Summarize an understanding of the role of socio-cultural factors as determinants of health and behavior in health and sickness.	L2
CO3	Relate to therapeutic situations in the practice of physiotherapy	L4
CO4	Understand the role of family and community in the development of behaviors	L2
CO5	Develop a holistic outlook toward the structure of society and community resources	L2

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L2	H	H	H	M	L	L	M	M	L	L	-	-
CO2	L2	H	H	M	L	H	L	M	M	L	L	-	-
CO3	L4	M	H	H	L	-	-	H	M	L	M	-	-
CO4	L2	M	H	H	-	H	L	M	M	L	M	-	-
CO5	L2	H	H	M	-	L	-	-	M	L	H	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER – GENERAL & CLINICAL PSYCHOLOGY

CODE-BPT105

COURSE OBJECTIVES:

- Define the term Psychology & its importance in the Health delivery System & will gain knowledge of Psychological maturation during human Development & growth & alterations during aging process.
- Understand the importance of psychological status of the person in Health & disease, environmental & emotional influence on the mind & personality.
- Acquire the Knowledge as to how to deal with the patients.
- Socioeconomic and cultural issues related to morbidity owing to the physical disability and handicaps.

I. General Psychology – UNIT-I

- 1) Definition of Psychology
 - i. Science of mind consciousness and behavior
 - ii. Scope and branches of Psychology
- 2) Methods of Introspection, observation and experimentation
- 3) Heredity and Environment
 - a. Relative importance of heredity and environment
 - b. Physical characteristics intelligence and personality
 - c. Nature vs. nurture controversy

Theories of Learning, Memory and Perception: UNIT-II

- 4) Learning
 - Types of Learning
 - a. Trial and error
 - b. Classical Learning
 - c. Instrumental Learning
 - d. Insight for Learning
- 5) Memory
 - a. Step of memory
 - b. Measurement of memory
 - c. Causes of forgetting
 - d. Concept of STM and LTM
- 6) Perceptual process
 - a. Nature of perceptual process
 - b. Structural and function factors in perception
 - c. Illusion and Hallucination

Psychology of Emotion, Motivation and Intelligence: UNIT-III

- 7) Emotion
 - a. Emotion and feeling
 - b. Physiological changes
 - c. Theories of emotion (James – Lange and Eonnon – Bird)
- 8) Motivation
 - a. Motive need and Drive
 - b. Types of motive physiological, psychological and social

- 9) Intelligence
Definitions theory and assessment
- 10) Personality: Definition, Types and measurements

Applied Psychology: UNIT-IV

Section – A Industrial Psychology

1. Human Engineering
Importance of human Engineering
Development of human Engineering
Problems in human Engineering
2. Decision Making
Process and steps indecision making
Individual decision –making
Decision making in organization
3. Stress and mental health
Cause and reaction to stress
Stress management
4. Work Culture, moral and rewards of work discipline
5. Guidance and counseling
Meaning, types and objectives of counselor
6. Child Psychology
Concepts of child Psychology
 - a) Meaning nature and subject matter of child Psychology
 - b) Practical importance of studying child Psychology for rehabilitation professionals

Rehabilitation Psychology: Unit-V

Interpersonal Relationships, familial & Social Relationships, acceptance about the disability – its outcome in relation to different diagnostic categories psychological aspects of multiple handicapped, contribution of psychology in Total Rehab.

Books Recommended:

1. Introduction to psychology- Mums- I.D.P. Co.
2. Foundation of psychology- Weld- Publishing house, Bombay.
3. Introduction to social psychology- Akolkar- Oxford publishing house.
4. Psychology and sociology – Applied to Medicine – Porter & Alder – W.B.Saunders.
5. Behavioral Science for Medical - undergraduates –Manju Mehta – Jaypee Brothers
6. Elementary Psychology –Mohsin Moti Lal Banarsi Dass, Delhi.

CO	STATEMENTS (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Understand the elementary principles of behavior for applying in the therapeutic environment.	L2
CO2	Know about psychology and its importance in the health care delivery system and gain knowledge of psychological maturation during human development, growth and alteration during ageing process.	L1
CO3	Recognize and help with the psychological factors involved in disability, pain, disfigurement, unconscious patients, chronic illness, death, bereavement and medical-surgical patients/conditions	L2
CO4	Perform psychosocial assessment of patients in various developmental stages, understand the concept of stress and its relationship to health, sickness and one's profession and learn counselling techniques to help those in need.	L3
CO5	Implementation of various techniques and therapies in the treatment / management of clinical disorders	L3

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L2	H	H	H	M	L	L	M	M	L	L	-	-
CO2	L1	H	H	M	L	H	L	M	M	L	L	-	-
CO3	L2	M	H	H	L	-	-	H	M	L	L	-	-
CO4	L3	M	H	H	-	H	L	M	M	L	M	-	-
CO5	L3	H	M	H	M	M	L	L	M	L	M	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER - BASIC PRINCIPLES IN PHYSIOTHERAPY

CODE-BPT106

COURSE OBJECTIVES:

- To understand the basic principles of exercise therapy.
- To understand the basic principles of electrotherapy.
- To understand the concept of Manual therapy.

UNIT I

1. Physical Principles:

- Structure and properties of matter- solids, liquids and gases, adhesion, surface tension viscosity, density and elasticity.
- Structure of atom, molecules, elements and compounds.
- Electron theory, static and current electricity.
- Conductors, Insulators, Potential difference, Resistance & Intensity.

Ohm's Law- Its application to AC & DC currents.

- a) Rectifying devices – Thermionic Valves, Semiconductors, Transistors, Amplifiers, Transducers Oscillator circuits.
- b) Capacitance, condensers in DC and AC Circuits.
- c) Display devices & indicators- analogue & digital.

UNIT II

2. Effects of Current Electricity

1. Chemical effects – Ions and electrolytes, Ionization, Production of a E.M.F. by chemical actions.
2. Magnetic effects, Molecular theory of Magnetism, Magnetic fields, Electromagnetic induction.
3. Millimeter and Voltmeter, Transformers and Choke Coil, thermal effect-joule law, heat production.
4. Physical principles of sound and its properties.
5. Physical principles of light and its properties.
6. Electromagnetic spectrum – biophysical application.

3. Electrical supply:

- a) Brief outline of main supply of electric current.
- b) Dangers- short circuits, electric shocks.
- c) Precautions – safety devices, earthing, fuses etc.
- d) First aid & initial management of electric shocks.

UNIT III

Introduction to exercise therapy, principles, technique and general areas of its application, Assessment & its importance.

BIOMECHANICS AND EXERCISE THERAPY

- a. Force: Composition of force, parallelogram of forces.
- b. Equilibrium: Stable, unstable, neutral.
- c. Gravity: Center of gravity, Line of gravity.
- d. Levers: 1st order, 2nd order, 3rd order, their examples in the human body and their practical applications in physiotherapy, forces applied to the body levers.
- e. Pulleys: Fixes, Movable.
- f. Springs: Series; Parallel
- g. Tension
- h. Elasticity: Hook's law.
- i. Axis: Sagittal, Frontal, Transverse, vertical.
- j. Planes: Sagittal, frontal, Horizontal.
- k. Definition of speed, Velocity, work, Energy, power, Acceleration, Momentum, Friction and Inertia.

UNIT IV

Introduction to movements including analysis of joint motion, muscle work and Neuro muscular co- ordination.

Principal classification techniques physiological &therapeutic effects indications & contraindications of therapeutic exercises.

UNIT V

Classification of movements: Describe the types, technique of application, indication, contraindications, effects and uses of the following.

- a) Active movement
- b) Passive movement.
- c) Active assisted movement
- d) Resisted movement

Book Reference:

1. Clayton's electrotherapy theory and practice IX Edition by Angela Forester Nigel Palastanga.
2. Clayton's electrotherapy theory and practice X Edition by Kitchen & Bazin.
3. Clinical Electrotherapy by RogarM. Nelson& Dean P. Currier.
4. Electrotherapy explained Principles and practice III Edition by John Low & Ann Reed.
5. Therapeutic heat and cold by Lehmann.
6. Principle and practice of Electrotherapy by Joseph Kahn.
7. Electrotherapy: Clinics in physical therapy- Wolf.
8. Practice exercise therapy- Hollis- Blackwell Scientific Publication

9. Therapeutic Exercises- Basmajian- Williams and Wilkins.
10. Therapeutic Exercises Foundations and Techniques –Kisner and Colby –F.A. Davis.
11. Proprioceptive Neuromuscular Facilitation –Voss et. al –Williams and Wilkins.
12. Principle of exercise of therapy – Gardiner –C.B.S. Delhi

COURSE OUTCOMES:

CO	Statements (After completion of this course, student will be able to)	Bloom Level
CO1	Explain about the basics of exercise and electrotherapy.	L2
CO2	Understand the principles, technique and effects of exercise as a therapeutic modality in the restoration of physical function	L2
CO3	Analyze the various types of therapeutic exercises, movements and demonstrate different techniques and describe their effects	L4
CO4	Practice different exercise therapy techniques and gain confidence in performing these skills before implementing the same on the patients so that high quality patient care is ensured	L3
CO5	Communicate with patients in a professional and ethical manner	L3

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L2	H	M	H	M	L	-	L	L	-	L	-	L
CO2	L2	H	M	H	M	L	-	L	M	-	L	-	L
CO3	L4	M	M	H	H	M	L	L	M	L	M	-	L
CO4	L3	M	M	H	H	M	M	L	M	L	M	-	L
CO5	L3	M	H	H	L	-	-	L	M	-	M	-	L

H- High, M- Moderate, L- Low, '-' for No correlation

BPT 107- English Communication

Code: BPT 107

Context :

In today's world of computers and digital media, a strong communication skill base is essential for learners and for smooth functioning of an organization.

Objectives :

1. To identify common communication problems that may be holding learners back
2. To identify what their non-verbal messages are communicating to others
3. To understand role of communication in teaching-learning process
4. To learn to communicate through the digital media
5. To understand the importance of empathetic listening
6. To explore communication beyond language.

Unit 1: Introduction to communication in organization & written communication

Nature, scope and importance, challenges in today's workplace and need for communicating effectively, process of communication, listening skills, advantages of written communication, basics of writing reports, preparing powerful resumes, memos, business emails.

Defining communication and communication in organizational setting, oral communication, written and non verbal communication. Listening skills.

Unit 2: Effective business writing letters:

Nature and forms of business letters: process of writing business letters: writing routines, good news bad news letters, goodwill letters and persuasive letters

Unit 3: Speech Dynamics and Leadership skills:

Basics of speaking in public: participating in meetings and group discussions: how to face interviews: presenting yourself before: at and after interviews: FAQ during interviews.

Concept of leadership and qualities and styles of effective leadership.

Unit 4: Designing and delivering presentation with time management:

Concept and types of presentation: subject selection and organizing information: organizing a presentation.

Concept and importance of time management: Techniques of time management : Barriers to effective time management.

Unit 5: Team Management skills:

Concept, understanding group formation, team effectiveness assessment, team management techniques.

Bibliography:

1. Sen Madhuchanda (2010), *An Introduction to Critical Thinking*, Pearson, Delhi
2. Silvia P. J. (2007), *How to Read a Lot*, American Psychological Association, Washington D
3. Soft skills training: A workbook to develop skills for employment by Fredrick H. Wentz
4. Personality development and Soft Skills , Oxford university Press by Barun. K. Mitra Mc Graw Hill Publishing Company Limited

Course Outcome :

CO1: Understanding of what good communication skills are and what they can do to improve their abilities. (Bloom's Level-L2)

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L2	-	L	-	-	-	-	-	H	-	-	-	-

BPT II YEAR

PAPER - PATHOLOGY & MICRO-BIOLOGY

CODE-BPT201

COURSE OBJECTIVES:

- Acquire the knowledge of concepts of cell injury and changes produced in different tissues and organs.
- Acquire the knowledge of concepts of Neoplasia with reference to the Etiology gross and microscopic features diagnosis and prognosis in different tissues and organs of the body.
- Correlate normal and altered morphology of different organ systems in different diseases needed for understanding disease process and their clinical significance (with special emphasis on neuro-Musculo- skeletal and cardio-respiratory system).

UNIT-I Introduction to Pathology and Cell Injury

1. Aims and objectives of study of pathology.
2. Brief outline of cell injury, degeneration, necrosis and gangrene.

UNIT-II General Pathology of Inflammatory Process and Circulatory System disorders

3. Inflammation: definition, vascular and cellular phenomenon difference between transudates and exudates. Granuloma.
4. Circulatory disturbances: Hemorrhage, Embolism Thrombosis Infarction, Shock, Volkmann's ischemic contracture.
5. Blood disorder: Anemia, Bleeding disorder.

UNIT-III Pathology of Cardiovascular and Respiratory System

6. CVS: Heart and blood vessels, Coronary heart disease.
7. Respiratory System: Ch. Bronchitis, Asthma Bronchiectasis, Emphysema, COPD etc.

UNIT-IV Pathology of Skeletal System and Nervous System

8. Bones and Joint : Arthritis & Spondyloarthropathy
9. PNS and Muscles: Neuropathies, Poliomyelitis & Myopathies etc.
10. CNS: Infection, Demyelinating disease, Degenerative disease etc.

Unit-V General Pathology of Neoplasm and Bodily Disorders

11. Neoplasia
12. Growth and its disorder like hypertrophy hyperplasia & atrophy.
13. Autoimmune diseases.
14. Healing and repair.
15. Diabetes mellitus and gout.

MICROBIOLOGY

UNIT-I Introduction to Microbiology

1. Introduction and History of Microbiology
2. General lectures on Microorganisms (brief)

UNIT-II Process of sterilization and Infection control

3. Sterilization and asepsis.
4. Infection – Source of infection and entry and its Spread

UNIT-III Immunity and Allergic Reactions

5. Immunity – Natural and Acquired
6. Allergy and hypersensitivity.

UNIT-IV Microbiology of Pathogens and Pathogenic Processes

7. Outline of common pathogenic bacteria and produced by them.
 - a) Respiratory tract infection
 - b) Meningitis.
 - c) Enteric infections.
 - d) Anaerobic infections
 - e) Urinary tract infections
 - f) Leprosy, tuberculosis and miscellaneous infections.
 - g) Wound infection
 - h) Sexually transmitted diseases.
 - i) Hospital acquired infections.

UNIT-V Microbiology of Viruses and Its Infections

8. Virology – virus infection, with special mention of Hepatitis.
9. Poliomyelitis & rabies.

Books Recommended:

1. Text book of pathology for dental student by harsh Mohan
2. Basic pathology by cotran Kumar Robbins.
3. Text book of microbiology for dental student by haveja
4. Text book of medical microbiology by Rajesh Bhatia
5. Textbook of medical microbiology by Arora & Arora

CO	STATEMENTS (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Learn the pathological changes in various conditions, diseases and disorders, which are commonly treated by physiotherapy.	L1
CO2	Demonstrate an understanding of the pathology of common diseases that therapists would encounter in their daily practice	L2
CO3	Understanding of core concepts of microbiology	L2
CO4	Know the methods used in study bacteria and can classify them.	L2
CO5	Understand the various pathogens of humanity like bacteria's, viruses and fungi.	L2

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L1	H	M	H	L	-	L	L	M	L	L	-	-
CO2	L2	H	L	M	L	-	-	-	M	L	L	-	-
CO3	L2	H	L	M	-	L	-	-	M	L	-	-	-
CO4	L2	H	M	M	L	L	L	-	M	L	L	-	-
CO5	L2	H	L	H	L	-	-	-	M	L	-	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER - PHARMACOLOGY

CODE-BPT202

COURSE OBJECTIVES:

- To understand pharmaco-kinetics, pharmaco-dynamics.
- Usage of common drugs with indications, contra-indications, side-effects.
- Course is not prescription oriented.
- To understand the drug action that may affect the physical therapy treatment.

Introduction to Pharmacology UNIT-I

1. General pharmacology:

Introduction and definition, Nature and source of drugs, Dosage form of drugs' Routes of drug administration, Pharmacokinetics (Absorption, Bioavailability, Distribution, Metabolism Excretion, First order Zero order Kinetics), Pharmacodynamics (site and mechanism of drug and factors influencing dosage and drug response).

Pharmacology of Nervous System: UNIT-II

2. **Drugs Affecting ANS:-** General Introduction, Drug affecting parasympathetic nervous system, Drugs affecting sympathetic nervous systems,
3. **Drugs affecting Peripheral (Somatic) nervous System:-** Skeletal Muscle Relaxants: Local Anesthetics.
4. **Drugs Affecting CNS: -** General anesthetics Anxiolytics and hypnotics, Alcohol, Opioid analgesics Drugs dependence and abuse Antiepileptic drugs, Drug therapy for Neurodegenerative disorders.

Pharmacology of Cardiovascular, Respiratory and Renal System: UNIT III

5. **Renal and CVS :-** Diuretics : Renin – angiotension system and its inhibitors, Drug treatment of Hypertension, Angina pectoris Myocardial infarction Heart failure, and hypercholesterolemia.
6. **Drugs Affecting Respiratory system:** Drug therapy of bronchial asthma and chronic obstructive pulmonary disease.

Drugs of Inflammation and Endocrine Disorders: UNIT-IV

7. **Anti – inflammatory drugs and related autacoids: -** Histamine Bradykinin, 5 – HT and their antagonists, Prostaglandins and leukotrienes, Nonsteroidal-Anti-inflammatory drug(NSAIDs), Anti rheumatic drugs and drugs used in gout.
8. **Endocrines:** Parathyroid hormone, Vitamin D, calcitonin and drugs affecting Calcium balance, Thyroid and antithyroid drugs, Adrenocortical and anabolic steroids, Insulin and Oral Hypoglycemic agents.

Pharmacology of Cancer and General Ailments: UNIT-V

9. **Chemotherapy:** Introduction, sulfonamides, Fluoroquinolones, penicillin, Cephalosporism, newer B – lactam antibiotic, aminoglycosides, Macrolides and Newer antibiotics, Teatracyclines, Chloramphenicol Chemotherapy of Tuberculosis and leprosy antiseptics – disinfectants.

10. **Miscellaneous Topics** : Management of stroke, Toxicology and heavy metal poisoning, special aspects of paediatric and geriatric Pharmacology, Drug interaction with drugs commonly used by physiotherapists, Hematinics, vitamins and antioxidants.

BOOKS RECOMMENDED:

1. Essentials of pharmacology by Surendra Singh
2. pharmacology by Bhattacharya Sen ray choice editor P.K. Das
3. Clinical Pharmacology by Sennet.

CO	STATEMENTS (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Possess a relevant knowledge in basic principles of pharmacology and its recent advances	L1
CO2	Understand the basic pharmacology of common drugs used, their importance in the overall treatment including Physiotherapy	L2
CO3	Understand the general principles of drug action on the gastric system of body.	L2
CO4	Understand the general principles of various antibiotics and the handling of drugs by the body.	L2
CO5	Relate the contribution of both drug and physiotherapy factors in the outcome of treatment.	L4

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L1	M	M	H	-	L	-	L	M	L	-	-	-
CO2	L2	H	M	H	L	H	L	L	M	L	L	-	-
CO3	L2	L	M	H	M	L	L	L	M	M	L	-	-
CO4	L2	H	M	H	L	M	L	L	M	H	L	-	-
CO5	L4	M	M	M	H	H	H	H	M	M	M	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER - BIOMECHANICS

CODE-BPT203

COURSE OBJECTIVE:

- To understand the biomechanical principles.
- To understand structure and function of human body.
- To understand application of various Biomechanical modalities

I. Essential concepts: UNIT-I

- i. Motion and forces, Axis and planes, Mechanical lever, Lever in Human body.
- ii. Force distribution – linear force, resultant force & Equilibrium, parallel force in one concurrent force.
- iii. Newton's laws – Gravity and its effects on human body
- iv. Moments
- v. Forces and moments in action
- vi. Concepts of static equilibrium and dynamic equilibrium
- vii. Composition and resolution of forces
- viii. Friction

II. Joints, Muscles & Nerve Structure & Function & Kinematical concepts: UNIT-II

Basic principles – general properties & function
Types / classification
Biomechanical properties
General effects of diseases , injury and immobilization

III. Kinetic aspects of limb movement: UNIT-III

Biomechanics of Upper Extremity
Scapulo – shoulder joint
Elbow joint
Wrist joint & Hand
Motion of hip & pelvis
Force of hip & pelvis
Motion of knee joint
Force of knee joint
Patellofemoral joint
Ankle and foot Kinematics
Motion of ankle
Force of ankle joint
Temporomandibular joint

IV. Vertebral Column :UNIT-IV

General structure and function of cervical, thoracic, lumbar & sacral vertebral.
Movements of vertebral column.
Thorax & chest wall – structure, function.
Effects of age, diseases, injury.

V. Biomechanics of Posture & Gait: UNIT-V

Gait cycle
 Parameters of gait
 Mykinetics of human gait
 Gait deviations
 Crutch and cane exercises
 Anatomical aspects of posture
 Factors affecting posture
 Assessment of posture
 Types of posture
 Postural deviation

Books Recommended:

1. Joint Structure and Function – A Comprehensive Analysis - Norkins & Levangie - F.A. Davis.
2. Measurement of Joint Motion – A Guide to Goniometry - Norkins & White - F.A. Davis.
3. Brunnstrom’s Clinical Kinesiology - Smith et al - F.A. Davis.
4. Basic Biomechanics explained - Low & Reed - Butterworth Heinemann.
5. Kinesiology: Applied to Pathological Motion - Soderberg Lippincott

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Analyze normal human movement from a global perspective, integrating biomechanics, muscle mechanics and motor control theory	L4
CO2	Experience quantitative methods of movement analysis of spine by using various methods	L4
CO3	Explain the kinetics and kinematics of upper limb and lower limb	L2
CO4	Evaluation methods of the musculoskeletal system	L5
CO5	Utilize quantitative methods of Gait & Posture analysis using various methods in physiotherapy	L3

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L4	M	M	H	M	L	H	L	M	L	L	-	-
CO2	L4	H	M	H	M	H	L	L	M	L	M	-	-
CO3	L2	M	M	H	M	H	L	L	M	L	M	-	-
CO4	L5	H	M	H	H	H	L	L	M	L	M	-	-
CO5	L3	H	M	H	M	M	H	L	M	L	M	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER - EXERCISE THERAPY

CODE-BPT204

COURSE OBJECTIVES:

- To understand the knowledge of physical therapy.
- To apply therapeutic exercises
- To understand the different approaches in manual therapy.

Introduction to Exercise Therapy with Various Exercises and Starting positions: UNIT-I

1. Basic physics in exercise therapy, Mechanics: force, Gravity, line of gravity in human body, Base equilibrium. Axes and Planes, mechanical principles of lever, order of lever, example in human body, pendulum, and spring.
2. Starting positions – Fundamental starting positions – standing, sitting, kneeling, lying and hanging. All the derived positions of the above five fundamental starting positions.
3. Classification of movements in details & Exercises.
4. Resisted exercises – Technique and types of resistance, SET system (Heavy Resisted exercises, Oxford method, De Lorme method, Macqueen method).
5. . Massage : definition of massage, type of massage, general effects and used of massage, local effects of individual manipulation (physiological effects), contra – indications, techniques of application of all manipulations – stroking, effleurage, kneading and picking up, skin rolling (back) clapping, tapping, friction etc

Physiotherapeutic Specialized Techniques and Assessment: UNIT-II

1. Suspension Therapy: Principals of suspension types – of suspension Therapy, effects and uses of Suspension Therapy. Their application either to mobilize a joint to increase joints range of motion or to increase muscle power – explaining the full details of component used for Suspension Therapy.
2. Relaxed passive movements, basic knowledge of classification of relaxed passive movements, technique, effects and uses of relaxed passive movement.
Muscles strength MMT: Anatomy and Physiology of muscle tissue causes of muscle weakness paralysis, prevention of muscle weakness / paralysis Types of muscle work and contraction ranges of muscle work prevention of muscle atrophy. Muscle assessment M.R.C. grading Principal of muscle strengthening / re-education, early re-education of a paralyzed.
3. Joint Mobilization and Goniometry; classification of joint movements causes of restriction of joint movement, prevention of joint range of motion etc. principles of mobilization of a point in increasing its range of motion Technique of mobilization of a stiff joint, Goniometry, peripheral joint mobilization, Concave convex rule.

Physiology of respiration and Exercise in Water and walking techniques: UNIT-III

1. Breathing exercises: physiology of respiration, types of breathing exercise, technique of various types of breathing exercises, its effects and uses & postural drainage.
2. Hydrotherapy : Introduction, various types of hydrotherapy units, construction and equipments used in hydrotherapy Principles, indication, contraindication, effects and uses of hydrotherapy, Precautions towards patient, towards therapist, equipment unit etc.

3. 2 point, 3 point & 4 point gait: Introduction, crutch measurement, crutch balance, various types of crutch gait details.

Exercise Physiology with Stretching, Yoga and Project: UNIT-IV

1. Individual, group and mass exercises maintenance exercises, plan of exercise – therapy table and schemes.

Aerobic exercise

Stretching

1. Yoga Definition History Principles Concepts, General effects of yogic posture on the body.
Students Project and Presentations: Vestibular Ball, Continuous Passive Motion Machine, Treadmill, Bicycle Ergometry, Dynamometer.

Neuromuscular Techniques and Assessment: UNIT-V

1. PNF: Definition, Principles, Basic procedure, Techniques of facilitation. PNF patterns for Upper Extremity PNF pattern for Lower Extremity.
2. Balance: Definition, Causes of balance disorder, Conditions and Evaluation. Balance exercise: Exercise for weakness, Exercise for movement strategies, Static balance exercise, Dynamic balance exercise, Balance exercise for vestibular dysfunction
3. Co – ordination Exercises: Definition of coordinated movements, in coordinated movements, Factors for coordinated movements technique of coordination exercises. Functional Re-Education

PRACTICAL

Massage Therapy

1. Suspension Therapy
2. Relax passive movement / types of exercise.
3. MMT
4. Goniometry
5. Breathing exercise.
6. Practical record
7. Gait and crutch walking.
8. Resistive Exercise.
9. Range of motion exercise.
10. Stretching.
11. Mobilization techniques.S
12. Breathing exercise and postural drainage.
13. Matt exercises
14. Balance
15. PNF
16. Practical record.

Book Recommended:

1. Practice exercise therapy- Hollis- Blackwell Scientific Publication
2. Therapeutic Exercises- Basmajian- Williams and Wilkins.
3. Therapeutic Exercises Foundations and Techniques –Kisner and Colby –F.A. Davis.

4. Proprioceptive Neuromuscular Facilitation –Voss et. al –Williams and Wilkins.
5. Principle of exercise of therapy – Gardiner –C.B.S. Delhi
6. Beard’s Massage –Wood- W.B. Saunders.
7. Motor control theory and practical application Shumway–Cook & Wallcott. - Lippincott.
8. Hydrotherapy, principle and practice- Campion – Butterworth Heinemann.
9. Muscle testing and functions – Kendall- Williams & Wilkins.
10. Daniels and Worthingham’s- Muscle testing- Hislop & Montgomery –W.B. Saunders.
11. Measurement of joint motion: A guide to Goniometry- Norkins & White- F.A. Davis.

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Describe the basic principles of exercise therapy and communicate with the patient in a professional and ethical manner	L1
CO2	Practice various assessment strategies like Goniometry, Tone assessment, Muscle power assessment etc for detailed learning	L3
CO3	Understand principles and procedures, indications, contraindications and precautions, appropriate methods of application of each of the assessment strategy and treatment techniques hands on models.	L2
CO4	Categorize various therapeutic techniques that can be used in physiotherapy	L4
CO5	Evaluate high quality, ethical, effective, and cost efficient practices by students and gain expertise in the exercise prescription to patients	L5

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L1	H	H	H	M	M	M	M	M	L	H	-	L
CO2	L3	H	H	H	H	L	H	L	M	L	M	-	L
CO3	L2	H	M	H	H	M	M	H	M	L	M	-	L
CO4	L4	H	H	H	M	M	H	M	M	M	M	-	L
CO5	L5	H	H	H	H	H	H	H	M	M	H	-	L

H- High, M- Moderate, L- Low, '-' for No correlation

ELECTRO THERAPY

CODE: BPT 205

COURSE OBJECTIVE:

- To describe the basic physics which is used in electrotherapy modalities.
- To explain the construction of electrotherapy modalities.
- To understand the indications and contra-indications of different electrical modalities.

Basics of Electrotherapy: UNIT-I

1. Electrical fundamentals – Physical principles – Structure and properties of matter” molecular atom, proton, neutron, electron, iron, etc. electrical energy: Nature of electricity Current – Electric potential generated by cell-Ohm’s Law, Joule’s Law.
2. Magnetic Energy: Nature and property of a management electromagnetic induction, principle of working of choke coil- transformation – rectification of A.C.to D.C Metal Oxide Rectifier, Semi – conductor – Diode and Triode.
3. Valves – Principle working – condenser – principle – Detail on charging and discharging, etc. transistors measurement of current intensity EMS and power – moving coil millimeter and voltmeter.
4. Wiring of components in series and parallel distribution of Electrical energy – Earth Shock and electrical shock safety Device.

Low Frequency Currents: UNIT-II

5. Principals and uses of LOW FREQUENCY CURRENTS: Nature and principles of production of muscle stimulating current – types of low frequency currents used for treatment. High Voltage Galvanic current, Rectifying currents.
6. Principles of electro diagnosis – strength duration curve, chronaxie and Rheobase – Their relationship, etc.
7. TENS.

Medium frequency Currents: UNIT-III

8. Medium Frequency Current: Definition, Production (brief), Physiological effects and therapeutic effects of Interferential Current,
9. Russian currents and Di dynamic Currents

Action Therapy Techniques: UNIT-III

10. Action Therapy: Definition, Production (Brief), Physiological & Therapeutic effects of the following – Infrared radiation, Ultraviolet Radiation.
11. Traction.

Therapeutic Heat and Cold: UNIT-IV

12. Therapeutic Heat: Definition, Principles, Physiological & therapeutic effects of moist heat, paraffin wax bath, and Contrast bath whirl pool bath Fluidotherapy, Electric heating pads.
13. Cryotherapy: Principles, Physiological effects, uses of Cold packs, Ice massage, Commercial Cold Packs, Ice Towels, Cold compression Units, Evaporating Sprays.

High Frequency Currents: UNIT-V

14. SWD, Principle and Production and Types, Therapeutic Effects, Indications, Contraindication and Dangers
15. MWD, Principle, Types, Therapeutic Effects, Indications, Contraindication and Dangers
16. Ultrasound. Principle and Production Types, Therapeutic Effects, Indications, Contraindication and Dangers
17. Laser: Principle and production Types, Therapeutic Effects, Indications, Contraindication and Dangers

PRACTICAL

1. Galvanic & faradic current
2. Cold pack
3. Paraffin wax bath
4. Hot pack
5. Motor point stimulation
6. Traction
7. Technique of application of electrotherapeutic modalities in various conditions and to various parts of the body. Maintenance of practical records.
8. Practical application of the above.
9. Practical record.

Books Recommended:

1. Electrotherapy explained principles & practice low & reed – Butterworth Heinemann.
2. Claytons electrotherapy (10th edition) kitchen & Bazin- w.b. Saunders..
3. Therapeutic heat and cold Lehman William & Wilkins.
4. Principles and practice of electrotherapy Kahn Churchill Livingstone.
5. Electrotherapy: clinics in physical therapy- wolf Churchill Livingstone.

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Construct the principles, technique and effects of electrotherapy as a therapeutic modality in the restoration of physical function in various conditions in physiotherapy	L3
CO2	Describe the indications and contra-indications of various types of electrotherapy modalities and equipment's	L1
CO3	Understanding the instrumentation, Biophysical principles and effects, dangers, safety measures, judicial use, appropriate methods of application, contraindications of the various low, medium and high frequency equipments.	L2
CO4	Categorize various electrotherapeutic techniques that can be used in physiotherapy	L4
CO5	Evaluate high quality, ethical, effective, and cost efficient practices by students and gain expertise in the electrotherapeutic system of therapy prescription to patients	L5

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L3	H	M	H	H	M	M	L	M	L	M	-	L
CO2	L1	H	M	H	H	M	M	L	M	L	L	-	L
CO3	L2	H	H	H	M	M	M	M	M	L	L	-	L
CO4	L4	H	M	H	H	M	H	H	M	M	M	-	L
CO5	L5	H	H	H	H	M	H	H	M	M	H	-	L

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER – ETHICS AND LAW IN PHYSIOTHERAPY

CODE-BPT206(A)

COURSE OBJECTIVES:

- To understand the ethical principles in physiotherapy.
- To understand the rights of patients.
- To understand the laws and legal concepts in physiotherapy.

UNIT -1

History of physiotherapy.

Philosophy and Philosophical statements.

Major Ethical principles applied to moral issue in health care.

UNIT -2

Rules of professional conduct.

Scope of practice.

Personnel and professional standard.

Professional standard

UNIT-3

Relationships with patients.

Relationships with medical colleagues

Relationships between professional with carrier.

Relationships with in the profession.

UNIT-4

Confidentiality and responsibility.

Pervasion of services and advertising.

Sale of goods.

Professional and government licensing, Accreditation and Education standards.

UNIT -5.

Law

Legal concepts.

Protection from Malpractice claims.

Consumers protection Act.

Liability and Documentation.

Book References.

1. British Journal of Physiotherapy 1994 Issues
2. Medical Ethics- By. CM. Francis.

B.P.T. 2ND YEAR

PAPER – COMPUTER SCIENCE

CODE-BP206(B)

THEORY---70

Unit-I

Basic Structure of Computers (Qualitative Discussion) Computer Types, Basic Functional Units, Basic Operational Concept, Bus Structure, Software, Performance, Multiprocessor and Multicomputer, IAS Computer, Historical perspectives.

Unit-II

Register Transfer and Micro-operation Register Transfer Language, Register Transfer, Bus and Memory Transfers, Three State Bus Buffers, memory Transfer, Arithmetic and Logical micro-operations, Shift and Arithmetic shifts.

Unit-III

Basic Computer Organization and Design Instruction Codes, Stored Program Organization, Indirect Address, Computer Registers, Common Bus System, Computer Instruction, Timing and Control, Instruction Cycle, fetch Decode, Register Reference Instructions, Memory Reference Instruction, Input-Output and Interrupt, Design of Basic Computer, Design of Accumulator Logic.

Unit-IV

CPU Organization Arithmetic and Logic Unit (ALU)- Combinational ALU, 2'S Complement Addition, Subtraction Unit, Booths Algorithm for Multiplication, Division Hardware using Restoration Division Algorithm. General register organization, Control Word, Accumulator Based, Register Based, Stack Type CPU organization.

Unit-V

Introduction to C++: Principles Of Object Oriented Programming (Oop) – Software Evolution - Oop Paradigm – Basic Concepts Of Oop, Benefits Of Oop – Applications Of Oop. Tokens, Keywords, Identifiers, Variables, Operators, Manipulators, Expressions and Control Structures in C++

CO	Statements (After completion of this course, student will be able to)	Bloom's Level
CO1	Implementation of the ethical principles of physiotherapy in clinical settings.	L3
CO2	Adapt a behavior as per professional standard .	L3
CO3	Establish a good rapport with patient and other staffs while working in clinical settings.	L3
CO4	Possess a knowledge about the governing body of profession	L1
CO5	Understand the medico-legal issues in physiotherapy	L2

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L3	M	H	L	M	-	-	-	M	M	M	-	-
CO2	L3	L	H	-	L	-	-	-	M	L	M	-	-
CO3	L3	H	H	L	L	L	-	L	M	M	M	-	-
CO4	L1	H	M	H	M	L	L	L	M	-	L	-	-
CO5	L2	M	M	L	H	M	-	-	M	-	M	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

B.P.T. 3RD YEAR

PAPER - GENERAL MEDICINE

CODE-BPT 301

COURSE OBJECTIVES:

- To understand the diseases and its pathogenesis.
- To understand the different lab tests and test significances.
- To understand the biological and biochemical processes

General medicine of Cardio Respiratory System: UNIT-I

1. Introduction of medicine.
2. Diseases of Respiratory System Physiology, clinical presentation in relation to chronic obstructive Pulmonary Disease.
3. COPD: Bronchial asthma, Emphysema, Bronchitis
Pneumonia Bronchiectasis Pleural effusion & Empyema Thoraces Pneumothorax, Cystic Fibrosis, Lung Abscess
4. Cardiac conditions and clinical presentations: Basic anatomy of heart, Coronary circulation and development of heart, Normal Cardiac contraction and relaxation: mechanism and diagnosis. Physiology, clinical Presentation in Ischemic heart disease. Physiology, clinical Presentation Congestive heart failure. Physiology, clinical Presentation peripheral vascular diseases & Deep vein thrombosis

Ailments of Renal and Endocrine System: UNIT-II

5. Diseases of Kidney
Physiology, Clinical presentation in relation to
A R F
C R F
6. Endocrine & metabolic diseases.
Vit. D & Calcium, Thyroid & parathyroid gland disorders

Diseases related to Nutrition, Viral And Bacterial Origin: UNIT-III

7. Nutritional Diseases
Physiology, Clinical presentation in relation to Obesity
8. Connective Tissue Diseases
9. Physiology, Clinical presentation in relation to
Rheumatoid arthritis
Gout & other connection tissue disorder
10. Infection Diseases
Tetanus
Leprosy
11. HIV / AIDS.
12. Psychiatric Ailments: Maina, Depression, Pchizophrenia, Psyhosis Obsessive Compulsive disorders

PEDIATRICS MEDICINE: UNIT-IV

1. Describe growth and development of a child from birth to 12 year including physical, social, adaptive development.
2. List the maternal and neonatal factors contributing to high risk pregnancy. The neonate: inherited diseases.
3. Briefly describe community programmes: International (WHO), national and local for prevention of poliomyelitis, blindness, deafness, mental retardation and hypothyroidism. Outline the immunization schedule for children.

PEDIATRIC MEDICINE RELATED TO DISEASES: UNIT-V

4. Cerebral palsy define and briefly outline etiology of prenatal, peri-natal and postnatal causes, briefly mention pathogenesis, types of cerebral palsy (Classification), finding on examination, general examination of C.N.S., Musculoskeletal and respiratory system. Briefly outline associated defects: Mental retardation, microcephally, blindness, hearing and speech impairment, squint and convulsions. Prevention: Appropriate management of risk pregnancies, prevention of neonatal and postnatal infection, metabolic problems.
5. Muscular Dystrophy: Outline various from, modes of inheritance and clinical manifestation physical finding in relation to disabilities progression of various from and prognosis. Describe treatment goals in forms which are and are not fatal.
6. Still's disease: Classification, Pathology in brief, physical findings, course & prognosis. Outline treatment, prevention and correction of deformity.
7. Acute C.N.S. infection: Classify (Bacterial and viral) and outline the acute illness & physiology, clinical presentation.
8. Intensive pediatric care & physiology, clinical presentation.

Book Recommended:

1. Davidson principle ad practice of medicine
2. Brain clinical neurology
3. Medicine & neurology by Golewala
4. Surgery by Nan
5. Bailey & love short practice of surgery.
6. Nelson text book of pediatrics- Behraman & Varghan.

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Demonstrate comprehensive understanding of general diseases and its pathology.	L2
CO2	Acquire the knowledge in medicine that are required to be practiced in community and at all levels of health care system	L1
CO3	Understand relevant investigations which will help to know about the important medical conditions	L2
CO4	Observe the sign & symptoms of different medical conditions.	L2
CO5	Demonstrate the ability to conduct a focused medical history and targeted physical examination appropriate to patient's chief complaint.	L3

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L2	H	M	H	M	L	L	H	H	M	L	M	M
CO2	L1	H	M	M	M	M	-	M	H	M	L	M	M
CO3	L2	H	M	H	M	-	-	L	H	M	L	M	M
CO4	L2	H	M	H	M	L	L	L	H	M	L	M	M
CO5	L3	M	L	M	M	M	M	M	H	M	L	M	M

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER - GENERAL SURGERY, OBSTETRICS & GYNAECOLOGY

CODE-BPT302

COURSE OBJECTIVE-

- Understand operative technique, surgical anatomy and pathology.
- Read about common surgical problems and principles.
- Understand the normal progress of pregnancy and delivery .
- Understand the general surgeries of ENT and ophthalmology .
- Demonstrate sufficient understanding of basic sciences and the clinical applications related to the Special surgeries to be able to integrate this knowledge into Clinical practice.

I) General surgery: UNIT-I

1. Principal of pre and postoperative management of surgical patients.
2. Common pre and postoperative complication
3. Surgical intensive care.
4. Description of events frequently accompanying in general anesthesia, blood transfusion and physiological response of the body to surgery.

II) Cardiothoracic Surgery : UNIT-II

Incisions used in cardiothoracic surgery – General pre and postoperative managements of cardiothoracic surgery – Various surgical procedures for various chest cardiac condition / disease.

III) OBS and GYN: UNIT-III

1. Anatomy of pelvic organs mechanism & physiology of pelvic floor sphincter muscles.
2. Pregnancy – stage of pregnancy – Labor – stage of labor – delivery, effect of menopause in emotions and musculoskeletal system & common gynecological problems.

IV) Plastic surgery: UNIT-IV

Principal of cinesplasty, tendon transplant, cosmetic surgery, types of grafts, Surgery of hand with emphasis on managements of traumatic injuries and leprosy.

V) Abdominal Surgeries and Burns: UNIT-V

1. Abdominal surgery: Incision complication and management of various abdominal surgeries.
2. Wounds, Sinuses and ulcers.
3. Burns: Degrees of burns and managements and reconstructive surgery following burns and complication of Burns.

BOOK RECOMENDED:-

1. Bailey & Love Shorts
2. Surgery by Nan
3. General surgery operations by R.M Kirk & Williston.
4. Modern trend of ophthalmology- Arnold Sorsby.
5. ENT of general Practitioners.

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Explain the concepts and knowledge of the general terminology, surgical incisions and postoperative care after various surgeries.	L2
CO2	Explain the various abdominal, thoracic and cardiac surgeries with skin grafting procedures.	L2
CO3	Understand the anatomy and physiology in Obstetrics and Gynecology and also should be familiar with common eye and ear problems and its treatment.	L2
CO4	Evaluate the common investigations like X Rays, MRI,s , CT Scans in relation of physiotherapy	L5
CO5	Adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.	L3

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L2	H	M	H	M	L	L	L	M	L	M	M	M
CO2	L2	H	M	H	M	-	L	M	M	L	M	M	M
CO3	L2	H	H	H	M	L	L	H	M	M	M	M	M
CO4	L5	H	M	H	L	-	-	-	M	L	M	M	M
CO5	L3	M	H	M	M	M	M	M	M	L	M	M	M

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER - CLINICAL ORTHOPEDICS

CODE-BPT303

COURSE OBJECTIVES:

- To understand the human skeletal system and pathogenesis of diseases related with skeletal system.
- To understand the different surgical procedure and its significances.
- To understand the anatomy and physiology of human skeletal system.

UNIT-I: Introduction to Orthopedics fractures and Dislocations

Fracture dislocations and regional orthopedic disorders in relation to orthopedic management.

UNIT-II: Deformities and Inflammatory Disorders in Orthopedics

Deformities: Common congenital and acquired deformities of foot, knee, hip, shoulder, elbow, and wrist including hand and spine Cervical rib, torticollis, metatarsalgia, claw hand and orthopedic management.

Inflammatory condition and lesions of joint and bones Osteoporosis, tuberculosis, pyogenic infection. Osteoarthritis, T.B. joints, Tenosynovitis, synovitis, capsulitis, tendonitis, Osteoporosis and osteomalacia, Sciatica, low back pain, brachial neuralgia Rheumatological disorders in detail and orthopedic management & above conditions.

UNIT-III: Surgical Procedures in Orthopedics

Operative Procedures, amputation Common sites, causes & management, Arthroplasty of joints, joint replacement (total and partial), Osteotomy

Reconstructive surgeries for the rehabilitation of Poliomyelitis, traumatic condition, spine, hand foot.

Principle of Tendon transfer and its procedure.

UNIT-IV Pediatrics Orthopedics

Pediatric musculoskeletal conditions and management

UNIT-V : Sports Injury & Radiological Assessment and Examination

Sports injuries and its management

Radiological examination.

Book reference:-

1. Orthopedics & Traumatology – Natarajan
2. Applied orthopedics
3. Outline of fracture -- Adams.
4. Outline of orthopedics – Adams.

CO	STATEMENTS (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Remember the concepts in skeletal system that is required to be practiced in community and at all levels of health care system.	L1
CO2	Understand the common operative procedures.	L2
CO3	Demonstrate comprehensive understanding of skeletal system including bones and joints.	L2
CO4	Assess of all the major and minor joints using special tests.	L4
CO5	Evaluation of all the relevant investigations which will help to know about the important medical and orthopedic conditions	L5

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L1	H	M	H	M	-	-	H	M	M	M	M	M
CO2	L2	H	M	H	H	M	L	M	M	L	M	M	M
CO3	L2	H	H	H	H	L	L	L	M	-	M	M	M
CO4	L4	H	M	M	M	H	H	H	M	L	M	M	M
CO5	L5	H	M	H	M	L	L	L	M	L	M	M	M

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER - CLINICAL NEUROLOGY & PEDIATRICS

CODE-BPT304

COURSE OBJECTIVES:

- To understand pathology related with nervous system .
- To understand the different surgical procedure and its significances.
- To understand the anatomy and physiology of nervous system

Neurology General Principles: UNIT-I

General principles of neurological and neurophysiologic and diagnosis.

Stroke : UNIT-II

Cerebrovascular diseases

Cerebral vascular accident

Infections and disorders of Nervous System: UNIT-III

Acute infection of C N S

Parkinsonism and other extra- pyramidal disorder.

M S & other disease.

- ALS (amyotrophic lateral sclerosis) and other motor neuron diseases.
- Diseases of peripheral nerves, cranial nerves, G.B.S. including peripheral nerve injury
- Myasthenia Gravis
- Diseases of muscles (polymyositis muscular dystrophy)
- Cervical and lumbar spondylosis and disc prolapsed.
- Neurosurgical Intensive care

Neurosurgery : UNIT-IV

Head injury – Cause and mechanism of head injury subdural, epidural and intracranial bleeding, types of neurological disorder, management of head injury.

Tumors of neurological system management.

Cranial & spinal cord lesion management.

Paraplegia, hemiplegia, quadriplegia.

Neurogenic bladder – classification

Pediatric Neurology and Surgical Procedures of Brain and Spinal Cord: UNIT-V

Pediatric conditions – Spina Bifida, Hydrocephalus,

Peripheral nerve lesion

Surgical management of brain disease and CVA.

Personality disorder, epilepsy.

Book recommended:

1. Adam and Victor principles of neurology
2. Lindsay Neurology and Neurosurgery Illustration

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Demonstrate comprehensive understanding of nervous system	L3
CO2	Understand relevant clinical features which will help to know about the important medical conditions	L2
CO3	Acquire the knowledge in nervous system that are required to be practiced in community and apply the same at all levels of health care system in physiotherapy	L2
CO4	Interpret the important medical and neurological conditions in physiotherapy	L4
CO5	Assess and differentiate neurological disorders.	L4

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L3	M	H	H	H	M	L	M	M	L	M	M	M
CO2	L2	H	H	H	M	M	L	M	M	L	M	M	M
CO3	L2	H	H	H	M	M	L	M	M	L	M	M	M
CO4	L4	H	M	M	H	H	H	M	M	L	M	M	M
CO5	L4	H	L	L	M	H	H	H	M	M	M	M	M

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER - Research Methodology and Biostatistics

CODE-BPT305

COURSE OBJECTIVES:

- To understand the significance of various research methodology.
- To understand the principles of biostatistics and its significances.
- To understand the applied methodology for research.

UNIT-I: Introduction to Research And Process

1. Review of literature.
2. Study design.
3. Sample size.
4. Sampling variability & significance.
5. Protocol writing.
6. Ethical aspects.

UNIT-II: Methods of Data Collection and other statistical significance

7. Data collection analysis, interpretation and presentation.
8. Common statistical terms.
9. Measures of location, average & percentiles.
10. Normal distribution & normal curve.
11. Demography & vital statistics.
12. Correlation of measures of population & vital statistics
13. Use of micro Computers in Research.

UNIT-III: Statistical Formulations

14. Probability.
15. Variability & its measures.
16. Significance of difference in mean.
17. Chi- square test.
18. Correlation & regression.
19. Hypothesis

UNIT-IV (Management studies)

Professional management ethics, administration, budget and development of organization.

- A. Definition - Branches of management - Principals of health sector management
- B. General principals of managements – Theories of Management
- C. Personal management – policies and procedures, basis concepts and theories.
- D. Financial issue including budget and income generation
- E. Principals of an organization chart.
- F. Organization of a department planning, space, manpower, material, basic requirements.
- G. Resources and quality management – planning with change and coping with change.
- H. Self – Management.
- I. Preparing for 1st job
- J. Time management
- K. Career development

UNIT-V (Professional management and ethics)

- i. The implication of and confirmation to the rules of professional conduct.
- ii. Legal responsibility for their action in the professional context and understanding liability and obligation in case of medico- legal action
- iii. A wider knowledge of ethics relating to current social and medical policy in the provision of health care.
- iv. National and international professional bodies: as a professional association and education body – Difference between scientific association (professional body) and statutory body.
- v. The role of international health agencies such as WHO.

Books Recommended:

1. Methods in Biostatistics- Mahajan- J.P.
2. Statistics in Medicine-Colton-Little Brown, Boston.
3. Research for Physiotherapist: Project Design and Analysis-Hicks – Churchill Livingstone
4. Biostatistics: The manual for Statistical methods for in health and nutrition-K.V.Rao. J.P.
5. Research methods in behavioural Sciences- Mohsin- Orient Publication.

CO	STATEMENTS (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Remembering various methodology of research and biostatistics in physiotherapy	L1
CO2	Demonstrate understanding of the concepts of research methodology and biostatistics that are required in the profession and community at all levels of research process.	L2
CO3	Apply the knowledge and concepts of research methodology and biostatistics in physiotherapy	L3
CO4	Analyze the principle concepts of biostatistics and research in physiotherapy	L4
CO5	Interpret the data collected while practicing the techniques on subjects during clinical postings by using the concepts of research methods and biostatistics learnt.	L5

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L1	L	M	M	-	-	-	-	M	L	-	-	-
CO2	L2	H	M	M	-	-	-	-	M	M	M	-	-
CO3	L3	L	M	M	-	M	L	M	M	M	M	-	-
CO4	L4	M	M	M	-	-	-	M	M	H	M	-	-
CO5	L5	H	M	M	L	H	M	-	M	H	M	-	-

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER - COMMUNITY MEDICINE

CODE-BPT306 (A)

COURSE OBJECTIVES:

- To understand the problems associated with the community.
- To understand the different preventive and curative methods for communicable diseases.
- To understand the role of social workers in community health.

UNIT I: Introduction to Community Medicine

1. General concepts of health and diseases, health determinants, with reference to natural history of disease with pro-pathogenic and pathogenic phases. The role of socio-economic and culture environment in health and disease. Epidemiology, emerging demographic changes, definition and scope.
2. Introduction to community health.
3. Public health administration an overview of health administration set up at Central and state levels.

UNIT II: National Health Programmes and Strategies

4. The national health programme – highlighting the role of social, economic and culture factors in the implementation of the national programme.
5. Health problems of vulnerable groups- pregnant and lactating woman, infant and pre – school children, occupational groups.
6. CBR and Institutional based rehabilitation and strategies to intervene in rural health system.
7. CBR in relation to different medical & surgical conditions.

UNIT III: Occupational Health and Social Security

8. Occupational Health – definition scope occupational disease prevention of occupational diseases and hazards.
9. Social security and other measurement for the protection from occupational hazards accident and diseases. Details of compensation acts.

UNIT IV: Family Planning and Mental Health

10. Family planning – objectives of national family planning programmes and family methods. A general idea of advantage and disadvantage of the methods.
11. Mental health emphasis on community aspects of mental, role of occupational therapist in mental health problems such as mental retardation etc.

UNIT V: Communicable Diseases and Epidemiology

12. Communicable disease- an overall view of communicable role of insect and other factors.
13. International health agencies.
14. Community medicine and rehabilitation epidemiology, habitat nutrition, environment anthropology.
 - a. The philosophy and needs of rehabilitation
 - b. Principles of physical medicine
 - c. Basic principles of administration of organization.

Book Reference:

1. Textbook of preventive and social medicine, Dr. J E Park

B.P.T. 3RD YEAR

PAPER - BIOENGINEERING

CODE-BP306(B)

THEORY---70

UNIT 1.

- Introduction and terminology: prosthesis and orthosis.
- Classification of orthoses and prostheses.
-

UNIT II:

- Bio-mechanical principles of orthotic application.
- Bio-mechanical principles of prosthetic application.

UNIT III:

- Designing of upper and lower extremity and spinal orthosis including indications and check out.

UNIT IV:

- Designing of upper extremity prostheses, indications and check out.
- Designing of lower extremity prostheses, indications and check out
- Materials used for fabrications.

UNIT V:.

- Psychological aspects of orthotic and prosthetic application.
- Prescription and design of foot wear and modifications.
- Wheel chairs
- Design and construction of adaptive devises.

Practical :The student is trained in evaluation and planning prosthesis and orthosis as well as in acquiring ability to do the check out.

Recommended Books: 1. Atlas of Orthotics: Biomechanical Principles and Applications, St. Louis, C.V. Mosby, 1975. 2. American Academy of Orthop

CO	STATEMENTS (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Demonstrate comprehensive understanding of community health workers.	L2
CO2	Acquire the knowledge in preventive and curative measures that are required to be practiced in community and at all levels of health care system.	L1
CO3	Understand relevant investigations which will help to know about the important medical conditions and occupational health conditions.	L2
CO4	Describe the common community diseases.	L2
CO5	Evaluate the influence of nutritional deficiency on community.	L4

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L2	H	H	H	M	L	-	M	M	L	M	M	M
CO2	L1	H	M	H	L	-	-	-	M	M	M	M	M
CO3	L2	M	L	M	M	H	M	H	M	M	M	M	M
CO4	L2	H	H	M	-	-	-	-	M	L	M	M	M
CO5	L4	M	M	L	M	M	H	H	M	M	M	M	M

H- High, M- Moderate, L- Low, '-' for No correlation

SUPERVISED CLINICAL TRAINING

CODE-BPT307

COURSE OBJECTIVES:

- To demonstrate knowledge of the clinical site's organization, administration, policies and procedures.
- To review the Physical Therapy documentation including the PT POC, goals, and objectives:
- To review the patient health record prior to treatment.
- To describe safe environments, appropriate risk management strategies, and emergency responses.

COURSE OUTCOMES:

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Students will successfully demonstrate knowledge of the clinical site's organization, administration, policies and procedures, organizational planning and operation.	L2
CO2	Under direct personal supervision, students will review the Physical Therapy documentation including the PT POC, goals, and objectives.	L3
CO3	Under direct personal supervision, students will review the patient health record prior to treatment.	L3
CO4	Under direct personal supervision, students will describe safe environments, appropriate risk management strategies, and emergency responses.	L2

BPT 4th YEAR

PAPER - PHYSIOTHERAPY IN ORTHOPEDIC CONDITIONS

CODE- BPT401

COURSE OBJECTIVES:

- To integrate the physiotherapeutic knowledge of orthopedic and Traumatology.
- To improve skills in clinical situation of dysfunction and musculoskeletal pathology.
- To make student able to identify disabilities, plan and set treatment goals.

UNIT-I INTRODUCTION TO PT REHABILITATION

Brief review of Orthotics conditions and various Physiotherapeutic modalities, aim, mean and techniques of Physiotherapy should be taught.

UNIT-II Rehabilitation of Fractures and Dislocations

Dislocations: Classification – types of displacements methods of immobilization. Healing of fracture and factor influencing union, non – union, delayed union etc.

Specific fracture and their complete Physiotherapeutic management.

Physiotherapeutic management of fracture of spine with paraplegia and without neurodeficit.

Fracture cast bracing and mobilization

UNIT-III Rehabilitation of Soft Tissue Injuries and Amputation

Physiotherapy in relation to soft tissue injuries

Physiotherapy in relation to amputation

Unit-III Pediatric rehabilitation

Physiotherapy in relation to various deformities e.g. CTEV, Pes planus, pes cavus etc.\

Physiotherapy in various acquired & congenital spinal cord disorders.

UNIT-IV Rehabilitation of Inflammatory Conditions and Sports Injuries

Physiotherapy in relation to arthritis

Physiotherapy in Sports Injuries

UNIT-V Special techniques of Rehabilitation and Treatment in Physiotherapy

BASIC Concepts of : Maitland, Kaltenborn, Cyriax, Mulligan, McKenzie.

Neurodynamics, Muscle Energy Techniques. Myofascial Release techniques

Special techniques Brief Introduction and Application Principles, Indications, Contraindications of : Dry Needling, Taping and Cupping

PRACTICAL:

1. Various techniques of Physiotherapy for the above mentioned condition /diseases should be demonstrated and practical by the students.
2. Assessment planning and management of orthopedics conditions
3. General viva

4. Practical record

REFERENCE BOOKS-

1. Cash textbook orthopaedics and Rheumatology for physiotherapists – Downie –Jaypee brothers.
2. Tidy’s physiotherapy- Tomson et. al Butterworth Heinmann
3. Essentials of orthopaedics and applied physiotherapy – Joshi and Kotwal- B.L. Churchill Livingstone.
4. Tetraplegia & Paraplegia- Bromley- W.B. Saunders.
5. Orthopaedics physiotherapy- Donatelli & Wooden- WB. Saunders.
6. Rheumatological Physiotherapy- David – Mosby
7. Orthopaedic Physiotherapy- Tid well – Mosby
8. Physiotherapy for amputee- Engstrom & Van de van – Churchill Livingstone
9. Sports Injuris: Diagnosis and management: Norris Butterworth Heinmann.

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Examine relevant investigations technique which will help to diagnosed various orthopedic and sports conditions.	L4
CO2	Plan clinical decision making ability and treatment techniques in different musculoskeletal conditions with physiotherapeutic approach	L3
CO3	Implement pre and post operative management/special techniques.	L3
CO4	Evaluate degenerative joint and spine diseases.	L5
CO5	Understand the principles of sports physiotherapy.	L2

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L4	H	M	H	H	H	H	M	H	M	M	H	H
CO2	L3	H	M	H	H	H	H	H	H	M	M	M	M
CO3	H	M	M	H	H	H	H	H	M	M	H	M	M
CO4	L5	H	M	H	H	H	M	M	H	M	M	M	M
CO5	L2	H	M	H	L	-	-	-	H	M	M	M	M

H- High, M- Moderate, L- Low, ‘-’ for No correlation

PHYSIOTHERAPY IN NEUROLOGICAL CONDITIONS

Code: BPT 402

COURSE OBJECTIVES:

- Student will be able to identify disability due to neurological dysfunction, set treatment goals.
- Apply skills in exercise therapy, electrotherapy in clinical situation to restore neurological function.
- Integrate the knowledge gain by students in clinical situation of dysfunction due to pathology in nervous system.

UNIT-I Neuroanatomy

Review the basic anatomy of the brain and spinal cord including: Blood supply of the brain and spinal cord, anatomy of the visual pathway, connection of the cerebellum and extra pyramidal system, relationship of the spine cord segment, long tracts of the spine cord, the brachial and lumbar plexuses and cranial nerves.

UNIT-II Neurophysiology

Review in brief the Neurophysiologic basis of : tone and disorders of tone and posture, bladder control, muscle contraction and movement and pain.

UNIT-III PEDIATRIC, DEGENERATIVE AND INFECTION MANAGEMENT OF NERVOUS SYSTEM

Clinical Features & Managements

Briefly outline the clinical features and management of the following Neurological Disorders.

1. Congenital and childhood disorders.
 - a. Hydrocephalus
 - b. Spina Bifida
 - c. Arnold Chiari malformation, Dandy
2. Degenerative disorders.
 - a. Parkinson's disease
 - b. Dementia
3. Infections
 - a. Pyogenic Meningitis sequelae
 - b. Tuberculosis infection of central nervous system
 - c. Poliomyelitis
 - d. Brain abscess

UNIT-IV PT MANAGMENT OF STROKE AND BRAIN ANOMALIES

4. Cerebrovascular accidents.
 - a. General classification, thrombotic, embolic, hemorrhagic and inflammatory stroke
 - b. Gross localization and sequelae
 - c. Detailed rehabilitative programme.
5. Trauma – board localization, first aid and management of sequelae of head injury and spinal cord injury.

6. Diseases of the spinal cord
 - a. Craniovertebral junction anomalies.
 - b. Syringomyelia
 - c. Tumors
 - d. Spinal arachnoiditis
7. Demyelinating diseases (central and peripheral)
 - a. Gullian – Barre Syndrome
 - b. Acute disseminated encephalomyelitis
 - c. Transverse myelitis
 - d. Multiple sclerosis
8. Diseases of the muscle including myopathies: Classification, signs, symptoms, progression and management.
9. Peripheral nerve disorder
 - a. Epilepsy ; Definition, Classification and management
 - b. Myasthenia Gravis : Definition, course and management
 - c. Motor neuron disease
 - d. Herniation of brain

UNIT-V Neurological Assessment

Clinical assessment of neurological function to be taught through bedside or demonstration clinics spread out over at least 5 sessions.

1. Basic history to determine whether the brain, spinal cord or peripheral nerves is involved
2. Assessment of higher mental function such as orientation, memory, attention, speech and language.
3. Assessment of cranial nerves.
4. Assessment of motor power.
5. Assessment of sensory function touch, pain and position
6. Assessment of tone – spasticity, rigidity and hypotonic.
7. Assessment of cerebellar function
8. Assessment of higher cortical function – apraxia etc.
9. Assessment of gait abnormalities

PRACTICAL:

1. Various techniques of Physiotherapy for the above mentioned condition /diseases should be demonstrated and practical by the students.
2. Assessment planning and management of orthopedics conditions
3. General viva
4. Practical record

REFERENCE BOOKS-

1. Cash's textbook of neurology for physiotherapists – Dowani – J.P. Brothers.
2. Adult Hemiplegia – Evaluation & treatment – Bobath – Oxford Butterworth Heinman
3. Neurological Rehabilitation – Carr & Shepherd – Butterworth Heinman
4. Tetraplegia and paraplegia – A guide for physiotherapist – Bromley – Churchill Livingstone.

5. Neurological physiotherapy – A Problem solving approach – Susan Edwards – Churchill Livingstone.
6. Neurological Rehabilitation – Umpherd – Mosby.
7. Geriatric physical therapy – Gucciona – Mosby.
8. Motor assessment of Developing Infant – Piper & Darrah – W.B. Saunders.
9. Paediatric physical therapy – Teckling Lippincott.
10. Treatment of cerebral Palsy and motor Delay – Levitts- Blackwell Scientific Publications, London.
11. Aging the Health care Challenge – Levis- F.A. Davis.
12. Physiotherapy in Paediatrics – Shepherd – Butterworth Heinman

CO	STATEMENTS (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Understand theoretical knowledge with clinical assessment.	L2
CO2	Evaluate relevant investigations technique which will help to diagnosed various Neurological condition conditions	L5
CO3	Plan clinical decision making ability with different physiotherapeutic treatment techniques in different neurological conditions.	L3
CO4	Analyze various spinal cord conditions.	L4
CO5	Plan the treatment of various disorders related to childhood and old age.	L3

Mapping of Course Outcomes onto Program Learning Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L3	H	H	H	M	L	M	M	M	M	M	H	H
CO2	L2	H	H	H	H	L	M	M	M	M	L	H	H
CO3	L5	H	H	H	H	M	H	M	M	M	M	H	H
CO4	L5	M	M	L	M	H	H	H	M	H	M	M	H
CO5	L5	M	M	L	M	H	H	H	M	H	M	L	H

PHYSIOTHERAPY IN GEN. MEDICINE & SURGICAL CONDITION

Code: BPT 403

Course Objective –

- Able to integrate theoretical knowledge with clinical assessment.
- Develop the ability to collect history, perform relevant clinical assessment and frame appropriate electrotherapeutic and exercise therapy management for the patients.
- Demonstrate clinical decision making ability and provide appropriate patient care.
- Develop effective communication with patients, family, colleagues and students
- To carry out research and publications towards upliftment of the field of Physiotherapy.

UNIT-I Introduction and PT Management of General and Neuro Surgeries

Brief review of the following surgical condition and various Physiotherapeutic modalities aims means and techniques of physiotherapy should be taught and complication. Peripheral Nerve Injuries. Pre & Post operative physiotherapeutic managements of Nerve Repair / Grafting.

UNIT-II Rehabilitation in Cardio-Respiratory Surgery

- Postural drainage & respiratory physiotherapy in CTVS
- Physiotherapy in patients on ventilators
- Pre and post Operative physiotherapy management of following conditions
- Thoractomy Lobectomy Thoracoplasty Pneumonectomy
- Orientation about atelectasis, pneumothorax, pre and post operative physiotherapy management of cardiac surgery, open heart surgery.

UNIT-III PT Management following Burns, skin graft and Hand

- Burn & its classification physiotherapy management.
- Pre & postoperative physiotherapy of skin grafting.
- Physiotherapy of case after reconstructive surgery of hand.
- Physiotherapy in Hand Injury.

UNIT-IV Rehabilitation of Abdomen

- Abdominal Surgical Quadrants
- Pre and post Operative physiotherapy management of following abdominal surgical conditions including incisions pre and postoperative complications
- Herniorraphy Nephrectomy Radical Mastectomy etc

UNIT-V Physiotherapy Rehabilitation in Obstetrics/Gynecology

- Physiotherapy in obstetrics
- Physiotherapy in PID, Stress incontinence, prolapsed uterus, etc.
- Pre & post operative physiotherapeutic managements of Neurosurgical conditions

PRACTICAL:

1. Various techniques of Physiotherapy for the above mentioned condition/diseases should be demonstrated and practical by the students.
2. Assessment planning and management of orthopedics conditions

3. General viva
4. Practical record

Book Recommended:

1. Cash textbook of general medical and surgical conditions for physiotherapists- Downie Jaypee Brothers.
2. Cash textbook of heart, chest and vascular disorders for physiotherapists- Downie Jaypee Brothers.
3. Principle and practices of cardiopulmonary physical therapy – Frown Felter- Mosby.
4. Chest physiotherapy in intensive care unit- Mackenzie – Williams & Wilkins.
5. Restoration of motor functions in stroke patient: A Physiotherapist approach- Johnstone Churchill Livingstone.
6. Physiotherapy Obstetrics and Gynecology – Polden – F.A. Davis

CO	STATEMENTS (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Understanding the knowledge on Basic Medical sciences, Human Movement Sciences, Various medical Conditions and Surgical Treatments to identify Psychological, Social, Economical, Cultural aspects of diseases and its impact on community.	L2
CO2	Apply the knowledge to perform a safe, systematic and appropriate physiotherapy assessment and treatment for various medical Conditions.	L3
CO3	Examine the various pathological changes and make the treatment plan accordingly.	L4
CO4	Examine the wound and deformity to give proper treatment plan.	L4
CO5	Decide the treatment plan according to surgical procedure performed.	L5

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L2	H	M	M	L	H	-	-	M	M	M	H	H
CO2	L3	H	M	M	M	L	H	-	M	M	L	M	M
CO3	L4	M	H	M	H	H	H	L	M	M	M	M	M
CO4	L4	M	M	M	H	H	H	M	M	M	M	M	M
CO5	L5	M	M	M	H	H	H	M	M	M	M	M	M

H- High, M- Moderate, L- Low, '-' for No correlation

PHYSIOTHERAPY IN CARDIOTHORACIC AND PEDIATRIC CONDITIONS

Code: BPT 404

COURSE OBJECTIVES:

- Identify discuss and analysis of various cardi thoracic dysfunction and arrive at appropriate functional diagnosis.
- Acquire knowledge of evaluation and physiotherapeutic treatment for various cardi thoracic physiotherapy.
- Select strategies for cure, care and prevention, adopt rehabilitative measure for maximal possible functional independence

UNIT-I Introduction to PT Management with Basics of Rehabilitation

Introduction – Brief review of the following surgical condition and various Physiotherapeutic modalities aims means and techniques of physiotherapy should be taught

Prior to beginning with various conditions brief introduction of breathing exercises and postural drainage in detail to be taught.

UNIT-II Rehabilitation of Respiratory and Vascular Diseases

Anatomy and physiology of Lungs

Physiotherapy management of respiratory systems disorders

COPD: Bronchial asthma, Emphysema, Bronchitis

Pneumonia Bronchiectasis Pleural effusion & Empyema Thoraces Pneumothorax, Cystic Fibrosis, Lung Abscess

Pulmonary Rehabilitation

UNIT-III Rehabilitation of Cardio-Vascular Diseases

Anatomy and physiology of Heart, Cardiac Rehabilitation, Physiotherapy management of Cardiovascular systems disorders, Cardiac conditions and clinical presentations: Basic anatomy of heart, Coronary circulation and development of heart, Normal Cardiac contraction and relaxation: mechanism and diagnosis. Physiology, clinical Presentation in Ischemic heart disease. Physiology, clinical Presentation Congestive heart failure. Physiology, clinical Presentation peripheral vascular diseases & Deep vein thrombosis

UNIT-IV Rehabilitation of Endocrine System Nutrition, Viral And Bacterial Origin

PT Management

1. Endocrine & metabolic diseases.
Calcium, Thyroid & parathyroid gland disorders
2. Nutritional Diseases Psychiatric Aliments: Maina, Depression, Pchizophrenia, Psychosis Obsessive Compulsive Edema, Non Articular' Rheumatism Rickets Vitamin Deficiency Syndrome, Myopathy, Diabetic Neuropathy, Rheumatoid Arthritis and General Cardiac rehabilitation and pulmonary rehabilitation in children and adults.
3. General and Physiotherapeutic management of Psychiatric patients

UNIT-V REHABILITATION IN PEDIATRIC MEDICINE

1. Cerebral palsy define and

2. Prenatal, peri-natal and postnatal physiotherapy care
3. Muscular Dystrophy: PT Management.
4. PT Management of Meningitis, Encephalitis, Hydrocephalus, Spina Bifida, CTEV, CDH

PRACTICAL:

1. Various techniques of Physiotherapy for the above mentioned condition /diseases should be demonstrated and practical by the students.
2. Assessment planning and management of orthopedics conditions
3. General viva
4. Practical record

REFERENCE BOOKS-

1. Cash Textbook of general medical and surgical conditions for physiotherapists- Donnie Jaypee Brothers.
2. Essential of Cardiopulmonary physical therapy- Hillegass & Sadowsky- W,B. Saunders.
3. Cash textbook of Chest, Heart and Vascular Disorders for physiotherapists- Downie- J.P. Brothers.
4. The Brompton Guide to chest physical therapy
5. Cardiopulmonary Physical Therapy- Irwin and Tecknin, Mosby.
6. Cardiovascular/Respiratory physiotherapy- Smith & Ball- Mosby
7. ACSM Guidelines for exercise testing and prescription- ACSM- Williams and Wilkins.
8. Chest physiotherapy in intensive care unit- Mackenzie et al – Williams and Wilkins.

CO	STATEMENT (After completion of this course, student will be able to)	BLOOM'S LEVEL
CO1	Evaluate relevant investigations technique which will help to diagnosed various cardiothoracic conditions	L5
CO2	Analyze various cardio thoracic ICU management techniques	L4
CO3	Understanding and acquiring the Knowledge of various investigating procedure for cardiac and thoracic conditions.	L2
CO4	Plan clinical decision making ability with the various physiotherapy treatment approaches in different cardiac and thoracic condition.	L3
CO5	Perform pre and post operative management.	L2

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's Level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L5	H	H	H	M	L	-	-	M	M	M	H	H
CO2	L4	M	L	M	H	L	M	M	M	M	L	M	M
CO3	L2	H	H	H	H	M	H	M	M	M	M	M	M
CO4	L3	M	M	L	M	H	H	M	M	M	M	M	M
CO5	L2	M	H	L	M	H	H	M	M	M	M	M	M

H- High, M- Moderate, L- Low, '-' for No correlation

PAPER - RATIONALE OF REHABILITATION

CODE- BPT405(A)

COURSE OBJECTIVES:

- Understand role in the management of the disability with in rehabilitation team.
- Understand the concept of team approach in rehabilitation.
- Understand the medical and surgical aspect of disabling conditions

COURSE DESCRIPTION

UNIT-1 PRINCIPLES OF ORGANIZATION & ADMINISTRATION OF REHABILITATION UNITS

Principle or relationship between personnel of rehabilitation unit and other department.

Principles of relationship between the institution and the guardians of the handicapped or patient.

Principle of relationship between head of the unit with various government and semi-government, trusts and juniors.

Relationship between a staff and his supervisors equals and juniors.

Principle of maintaining department secrecy, handling difficult problems of day to day work.

Definition of policy and how best it is to be carried out.

Introduction to job analysis of importance.

Methods of teaching to handicapped and other workers in rehabilitation Unit.

Principles of teaching and guiding student's juniors and senior in O.T. and P.T. training schools and centers.

International classification of disability

UNIT II- REHABILITATION THERAPY

I a) The philosophy and need of rehabilitation.

b) Principles of physical Medicine.

II a) Basic principles of Administration and organization philosophy approach, budget,

b)Personnel and space.

c) Vocational Rehabilitation.

UNIT III -PRINCIPLES OF ORTHOTICS AND PROSTHETICS.

a)Lower extremity Orthotics.

Spinal Orthotics

Upper Extremity Orthotic.

b) Lower Extremity Prosthetics.

Upper Extremity Prosthetics.

c) Walking and ambulatory Aids

i) Wheel Chair

ii) Crutches and Canes

UNIT IV-PRINCIPAL OF MANAGEMENT OF COMMUNICATION IMPAIRMENT.

Speech production

Communication disorders secondary to brain damage.

Evaluating Language

Aphasia and its treatment.

Dysarthria and its treatment.

Non- aphasic Language disorders.

UNIT-V PRINCIPLES IN MANAGEMENT OF SOCIAL PROBLEMS

Social needs of the patient.

Rehabilitation center environment.

The social worker as a member of the rehabilitation team.

Contribution on social work.

Community Resources.

Principle in Management of Vocational problems and occupational therapy.

Disability evaluation and management

Architectural barrier

PRACTICAL:

Various techniques of Physiotherapy for the above mentioned condition /diseases should be demonstrated and practical by the students.

Assessment planning and management of orthopedics conditions

General viva

Practical record

REFENCE BOOKS-

1. Rehabilitation –Evans.
2. Directory for disabled people.
3. Improvement residential life for disabled people- truly.
4. Physical medicine & rehabilitation- Okawanta.
5. Community diagnosis & Health action- Bennerth.
6. Hand book of Physical medicine & rehabilitation.- Rusk.

B.P.T. 4th YEAR

PAPER – FIRST AID

CODE-BPT405(B)

THEORY---70

UNIT I: Advanced First Aid, CPR & AED

Practical demonstration of first aid, CPR, AED skills IV.

UNIT II: Automated External Defibrillators (AED)

- Airway Obstructions
- Controlling Bleeding
- Shock
- Wounds and Soft Tissue Injuries

UNIT III: Burns

- Head and Spinal Injuries
- Chest, Abdominal and Pelvic Injuries
- Bone, Joint and Muscle Injuries
- Extremity Injuries and Splinting

UNIT IV: Assessment Measures :

- Cold and Heat Emergencies
- Rescuing and Moving Victims

UNIT V: General Outline of Topics Covered:

Acting in an Emergency- The Human Body Assessing the Victim Cardiopulmonary Resuscitation (CPR)

- Sudden Illness
- Poisoning
- Substance Misuse and Abuse
- Bites and Stings

CO	Statement (After completion of this course, student will be able to)	Bloom's Level
CO1	Understand the principle of organization and administration.	L2
CO2	Formulate appropriate goal in treatment and rehabilitation	L3
CO3	Identify the residual potential in patient with partial or total disability.	L4
CO4	Classify communication disorders and able to manage them.	L3
CO5	Examine social problems and evaluate disability.	L4

Mapping of Course Outcomes onto Program Outcomes

Course Outcome	Bloom's level	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	L2	H	L	H	M	M	L	M	M	M	L	H	H
CO2	L3	H	H	H	H	H	H	M	M	L	L	M	M
CO3	L4	M	M	L	H	H	H	M	M	M	L	M	M
CO4	L3	M	M	L	M	H	L	L	M	L	M	M	M
CO5	L4	M	M	L	H	H	H	M	M	H	H	M	M

H- High, M- Moderate, L- Low, '-' for No correlation

MINOR PROJECT & CLINICAL TRAINING

CODE-BPT406

COURSE OBJECTIVES:

- To identification of the problem
- To use modern research tools/methods.
- To design and conduct experiments and identify the solution of the problem/s.

COURSE OUTCOMES:

CO	Statement (After completion of this course, student will be able to)	Bloom's Level
CO1	Enable the Students to undertake short research project under the direction of guide	L2
CO2	Impart skills in preparing detailed report describing the project and results.	L3
CO3	Enable the students to undertake fabrication work of new experimental set up/devices	L4
CO4	Effectively communicate by making an oral presentation before an evaluation committee	L3

CLINICAL INTERENSHIP & PROJECT

CODE-BPT501

COURSE OBJECTIVES:

- To undertake a research study under the guidance of Guide.
- To undergo a project viva-voice by examining committee.

COURSE OUTCOMES:

CO	Statement (After completion of this course, student will be able to)	Bloom's Level
CO1	Demonstrate the skill to evaluate, diagnose (physical diagnosis) and manage subjects under supervision of a faculty.	L3
CO2	Demonstrate the records and relevant patient's information, treatment and follow up.	L3
CO3	Demonstrate skill and presentation of a patient under his/ her during clinical meetings.	L4

6. Teaching-Learning Process/ Methodology (TLM):

The teaching-learning process should be aimed at systematic exposition of basic concepts so as to acquire knowledge of physiotherapy in a canonical manner. The various components of teaching learning process are summarized in the following heads.

2. **Class room Lectures:** The most common method of imparting knowledge is through lectures. There are diverse modes of delivering lectures such as through blackboard, power point presentation and other technology aided means. A judicious mix of these means is a key aspect of teaching-learning process.
3. **Tutorials:** To reinforce learning, to monitor progress, and to provide a regular pattern of study, tutorials are essential requirements. During these tutorials, difficulties faced by the students in understanding the lectures, are dealt with. Tutorials are also aimed at solving problems associated with the concepts discussed during the lectures.
4. **Practical:** To provide scientific visualization and obtaining results of Physiotherapy the practical sessions are conducted in exercise therapy and electrotherapy labs. These sessions provide vital insights into scientific concepts and draw learner's attention towards limitations of exercise therapy.
5. **OPD AND HOSPITAL(FIELD BASED LEARNING) :** Students may enhance their knowledge through rotatory clinical postings, medical camps and visits to special school.
6. **Textbooks learning:** A large number of books are included in the list of references of each course for enrichment and enhancement of knowledge.
7. **E-learning:** Learner may also access electronic resources and educational websites for better understanding and updating the concepts.
8. **Self-study materials:** Self-study material provided by the teachers is an integral part of learning. It helps in bridging the gaps in the classroom teaching. It also provides scope for teachers to give additional information beyond classroom learning.
9. **Assignment/Problem solving:** Assignments at regular intervals involving applications of theory are necessary to assimilate basic concepts of courses. Hence, it is incumbent on the part of a learner to complete open-ended projects assigned by the teacher.

WORKSHOP AND SEMINARS: Workshop and seminar on recent trends in the field of physiotherapy are organized time to time to update with the current scenario.

VARIOUS CLOURSE DELIVERY METHODS:

CD1-Lecture by use of boards/LCD projectors/OHP projectors
CD2-Tutorials/Assignments
CD3-Seminars
CD4-Self- learning advice using internets
CD5-Hospital visit & OPD

Clinical learning opportunities imparted through the use of advanced techniques

Teaching modality	Learning opportunity examples
Patients	Teach and assess in selected clinical scenarios
	Practice soft skills
	Practice physical examination
	Receive feedback on performance
Mannequins	Perform acquired techniques
	Practice basic procedural skills
	Apply basic science understanding to clinical problem solving
Simulators	Practice teamwork and leadership
	Perform cardiac and pulmonary care skills
	Apply basic science understanding to clinical problem solving
Task under trainers	As specific to the physiotherapy profession. Joint manipulation , chest physiotherapy etc.

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