DETAILED SYLLABUS FOR BACHELOR OF PHYSIOTHERAPY (BPT)

BATCH 2023-2024

SCHOOL OF PHYSIOTHERAPY

UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

PREAMBLE

Physiotherapy (PT) is a Movement Science with an established theoretical and scientific base and widespread clinical applications in the Prevention, Restoration & Rehabilitation, Maintenance and Promotion of optimal physical function. Physiotherapists diagnose and manage movement dysfunction and enhance physical and functional abilities. This physical dysfunction may be the sequelae of involvement of any of the systems like Musculoskeletal, Neurological, Cardiovascular, Respiratory, or other body systems.

These practitioners contribute to society and the profession through practice, teaching, administration, and the discovery and application of new knowledge about physiotherapy experiences of sufficient excellence and breadth by research to allow the acquisition and application of essential knowledge, skills, and behaviors as applied to the practice of physiotherapy.

Physiotherapists (PT) are autonomous, effective, and compassionate professionals, who practice collaboratively in a variety of healthcare set ups such as neonatal to geriatric, from critical care to community fitness to sports training. Emerging graduate and post graduate students are required to demonstrate a substantial knowledge base, possess skills related to Physiotherapy practices, possess high emotional quotient to address family health and meet community responsibilities, and demonstrate gender sensitivity and sociocultural relevant competence. They should be aware of legal issues governing professional practice and follow evidence-based clinical practices.

BACHELOR Of PHYSIOTHERAPY I YEAR

(1 Year Duration)

S.NO.	SUBJECT CODE	SUBJECT	CREDIT HOURS
1.	ANA101	Anatomy	**5**
2.	ANA191	Anatomy Practical	**2**
3.	PHY101	Physiology	**5**
4.	PHY191	Physiology Practical	**2**
5.	BCH101	Biochemistry	**2**
6.	ELT101	Electrotherapy-I	**4**
7.	ELT191	Electrotherapy-I Practical	**2**
8.	EXT101	Exercise Therapy-I	**4**
9.	EXT191	Exercise Therapy-I Practical	**2**
		TOTAL	28

BACHELOR OF PHYSIOTHERAPY II YEAR

(1 Year Duration)

S.NO.	SUBJECT CODE	SUBJECT	CREDIT HOURS
1.	BIK201	Biomechanics & Kinesiology	**4**
2.	COM201	Community Medicine	**4**
3.	ELT201	Electrotherapy-II	**4**
4.	ELT291	Electrotherapy-II Practical	**2**
5.	EXT201	Exercise Therapy-II	**4**
6.	EXT291	Exercise Therapy-II Practical	**2**
7.	PAM201	Pathology & Microbiology	**4**
8.	PHA201	Pharmacology	**4**
		TOTAL	**28**

BACHELOR Of PHYSIOTHERAPY III YEAR

(1 Year Duration)

S. No.	Subject	Total hours (Theory + Practical)			Credits		
		T	P	Total	T	P	Total
1.	Neurology & Neurosurgery (NNS301)	3	2	5	3	1	4
2.	Medical Conditions & Pediatrics (MEP301)	3	2	5	3	1	4
3.	Surgery including Obstetrics & Gynecology (SOG301)	3	2	5	3	1	4
4.	Clinical Orthopedics (CLO301)	3	2	5	3	1	4
5.	Community Physiotherapy & Rehabilitation (CPR301)	3	2	5	3	1	4
6.	Sociology & Psychology (SOP391)	4		4			4
7.	Research Methodology & Biostatistics (RMB301)	2		2			2
8.	Neurology & Neurosurgery Practical (NNS391)						
9.	Medical Conditions & Pediatrics Practical (MEP391)						
10.	Surgery including Obstetrics & Gynecology Practical (SOG391)						
11.	Community Physiotherapy & Rehabilitation Practical (CPR391)						
12.	Clinical Orthopedics Practical (CLO391)						
Grand Total				30			24

BACHELOR Of PHYSIOTHERAPY IV YEAR

(1 Year Duration)

S. No.	Subject	Total hours (Theory + Practical)			Credits		
		T	P	Total	T	P	Total
1.	PT in Neurology & Neurosurgery (PTN401)	3	2	5	3	1	4
2.	PT in Medical Conditions including Pediatrics (PTM401)	3	2	5	3	1	4
3.	PT in Surgical Conditions (PTS401)	3	2	5	3	1	4
4.	Rehabilitation Sciences in Physiotherapy (RSP401)	3	2	5	3	1	4
5.	PT in Orthopedics Conditions	3	2	5	3	1	4
6.	Sports Physiotherapy (SPT401)	3	2	5	3	1	4
7.	PT in Neurology & Neurosurgery Practical (PTN491)						
8.	PT in Medical Conditions including Pediatrics Practical (PTM491)						
9.	PT in Surgical Conditions Practical (PTS491)						
10.	Rehabilitation Sciences in Physiotherapy (RSP491)						
11.	PT in Orthopedics Conditions (PTO491)						
12.	Sports Physiotherapy (SPT491)						
13.	Mini Project (PRJ491)						
Grand Total				30			24

SUBJECT: ANATOMY

SUBJECT CODE: ANA101

CREDITS: 5

Course Objectives:

The objectives of this course will be to emphasize on Identification and application of the fundamental concepts and methods of a life or physical science. To explore natural phenomena, observation & experimentation. To understand, identify, and describe the basic anatomical structures associated with cells and tissue, and muscular, skeletal, and nervous systems. It helps to develop basic dissection in the field of anatomy.

Course Outcomes (CO):

After taking this course a student will:

CO1: Identify and apply the fundamental concepts and methods of a life or physical science. CO2: Apply the scientific method to explore natural phenomena, observe & experiment.

CO3: Understand, identify, and describe the basic anatomical structures associated with the circulatory / cardiovascular, respiratory, urinary, endocrine, reproductive, digestive, lymphatic, and integumentary systems.

CO4: Develop basic dissection and laboratory techniques relevant to the field of anatomy. Mapping of Course Outcomes (CO) and Program Outcomes (PO):

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1	□			□				
CO2	□			□				
CO3	□	□		□				
CO4	□			□				

Course Contents:

S. No.	Topics	Hours
1	**General Anatomy**	20 H
	Cell: (Parts, Name of Cytoplasm organelles and inclusion with their Functions)	
	Epithelium: Types with examples and light microscopic structure.	
	Connective Tissue: Classification with emphasis to tendon	
	Cartilage: Types with example	
	Bone: Types with example, types of Ossification (Stage of Ossification not required)	
	Joints: Classification with example, emphasis to synovial joint.	
	Muscles: Types (details of EM picture not required)	
	Nervous tissue: Structure of a Neuron, Synapse Reflex are, Degeneration and Regeneration of the Nerve	
	Embryology a) Ovum, Spermatozoa, fertilization, and formation of firm layers and their derivations	
	b) Development of skin, fascia, blood vessels, lymphatic.	
	c) Development of bones, axial and appendicular skeleton and muscles.	
	d) Neural tube, train vessels spinal cord.	
	e) Development of brain (brain stem) structures.	
	Regional Anatomy	
2	**Upper Extremity**	25 H
	Axilla,	
	Brachial plexus,	
	Shoulder joints,	
	Sterno-clavicular joints,	
	Axillary lymph Nodes,	
	Elbow joint,	
	Superior Radio-ulnar joint,	
	Nerves of arm and forearm,	
	Synovial Bursa of hand and palmar space,	
	Ulnar Nerve in hand,	

	Cutaneous distribution according to dermatomes,	
	Clinical Anatomy,	
	Surface Anatomy.	
	Inferior Extremity	30H
3	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,	
	Mid tarsal and sub-talar joint,	
	Cutaneous distribution according to myotome,	
	Clinical anatomy	
	Surface Markings.	

	Abdomen & pelvis	25H
4	Abdominal wall,	
	inguinal canal,	
	Stomach,	
	Liver,	
	pancreas,	
	kidney with ureter and spleen,	
	small Intestine,	
	Large Intestine,	
	Abdominal Aorta,	
	Portal vein,	
	Diaphragm,	
	Sacral plexus,	
	Sacro-Iliac joint,	
	Intervertebral disc.	
5	**Thorax**	15H
	Thoracic cage and Mediastinum,	
	Heart with its internal and external features,	
	Blood vessels,	
	Typical spinal Nerve,	

	Typical Intercostal space,	
	Mechanism of Respiration,	
	Surface markings of Hearts and Lungs.	
6	**HEAD & NECK**	14H
	Temporo-mandibular Joint,	
	Atlanto-occipital	
	Atlanto-Axial joint,	
	Cutaneous distribution of trigeminal Nerve.	
7	**NERVOUS SYSTEM**	15H
	General Introduction and classification,	
	Autonomic Nervous system (Idea about Sympathetic and Para Sympathetic with their difference in distribution and function).	
	Spinal cord with its meninges,	
	Spinal Reflex,	
	Pyramidal and extra-pyramidal tracts (Detail Nucleus not required)	
	Blood supply.	
	Parts of brain & meninges,	
	Gross Discussion of Hind Brain,	
	Mid Brain (cranial Nerve Nucleus position should be mentioned)	
	Fore brain – Cerebral hemisphere, functional areas, and blood supply	
8	**CRANIAL NERVES**	6H
	Names in order,	
	Individual Cranial Nerve distribution,	
	About upper Motor Neuron and Lower Motor Neuron,	
	Applied Anatomy	

SUBJECT: ANATOMY

PRACTICAL SUBJECT CODE:

ANA191 CREDITS: 2

S. No.	Topics	Hours
1	**HISTOLOGY PRACTICAL**	5H
	Epithelium (Simple, Compound)	
	Connectivity tissue (Cartilage & Bone)	
	Muscle (smooth & skeletal)	
	Nervous tissue (Neuron)	
	Blood vessels (Large artery and vein)	
2	**UPPER EXTREMITY**	9H
	Pectoral Region,	
	Axilla	
	Scapula & Clavicle	
	Humerus,	
	Muscles of arm (Front & Back),	
	Radius & Front of forearm,	
	Ulna & Back of forearm,	
	Muscles of Palm & arterial arches,	
	Articulated hand (Carpals and Metacarpals name and arrangements in order only).	
3	**INFERIOR EXTREMITY**	10H
	Hip bone,	
	Glutei Muscles,	
	Femur,	
	Front of thigh,	
	Back of thigh,	
	Medial side of thigh,	
	Tibia, Anterior compartment of leg,	
	Fibula, Lateral compartment of leg,	
	Back of leg,	
	Articulated foot (Identification of tarsal and metatarsal only).	
4	**ABDOMEN & PELVIS**	5H
	Abdominal viscera,	
	Sacrum,	

	Bony pelvis,	
	Viscera of Pelvis	
	Blood vessels.	
5	**THORAX**	7H
	Superior Mediastinal structures,	
	Sternum, Ribs (only general features),	
	Vertebrae (Identification, general features, Functional Components, Development, Vertebral Column with weight transmission),	
	Heart,	
	Pleura	
	Lungs	
6	**HEAD & NECK**	9H
	Mouth cavity,	
	Nasal cavity,	
	Pharynx and Larynx (Parts, Sensory distribution),	
	Cranial bones (Identification of Individual bone general features, different foramina in relation to cranial Nerve, Cranial fossae and their relation to brain and Hypophysis).	
	Identification of Anterior and Posterior triangles of Neck with their contents.	
	Radiological Anatomy of Musculo Skeletal system.	

7	**NERVOUS SYSTEM**	5H
	Spinal cord (with its meninges & Blood supply)	
	Parts of brain (including meninges, Hind Brain, Mid Brain, Fore brain – Cerebral hemisphere, functional areas, and blood supply).	

Suggested Reading:

Textbooks

1. B.D. Chaurasia, Human anatomy Vol.1 – Upper limb & Thorax, All Chapters
Vol.2 – Lower Limb & abdomen, All Chapters
Vol.3 – Head, Neck & Brain, All Chapters

2. Williams & Warwick, Gray's Anatomy-Churchill Livingstone.
3. Inderbir Singh, Textbook of Anatomy with colour Atlas-Vol. 1, 2, 3 Jaypee Brothers.

References

1. Adam W. M. Mitchell, Richard Drake, Gray's Anatomy, Churchill Livingstone
2. Frank H. Netter, Atlas of Human Anatomy.
3. Cunningham Manual of Practical Anatomy Vol. I, II, III, Churchill Livingstone.
4. Anatomy & Physiology by Smout and McDowell

SUBJECT: PHYSIOLOGY
SUBJECT CODE: PHY101
CREDITS: 5

Course Objectives:

The following goals relate to content and processes that are intended to provide students with a full understanding of physiology. They form the unifying foundation for all topics in physiology and are to be emphasized throughout. They help to develop a vocabulary of appropriate terminology to effectively communicate information related to physiology. Recognize the anatomical structures and explain the physiological functions of body systems. Synthesize ideas to make a connection between knowledge of physiology and real-world situations, including healthy lifestyle decisions and homeostatic imbalances. Demonstrate laboratory procedures used to evaluate physiological functions of each organ system. Interpret graphs of anatomical and physiological data.

Course Outcomes (CO):

After taking this course a student will:

CO1: Be able to demonstrate information literacy skills to access, evaluate, and use resources to stay current in the field of physiology.

CO2: Approach and examine issues related to physiology from an evidence-based perspective.

CO3: Communicate clearly and in a way that reflects knowledge and understanding of the human body and demonstrates the ability to adapt information to different audiences and applications.

Mapping of Course Outcomes (CO) and Program Outcomes (PO):

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1								
CO2								
CO3								

Course Contents:

S. No.	Topics	Hours
1	**General Physiology - Unit I**	20 H
	Introduction and scope of Physiology	
	Cell and tissue-Its structure, principal constituents, properties, and functions including cell division.	
	Body Fluid.	
	Blood: Composition and general functions of plasma. Blood cells – structure and function - Red Bleed cells, white Blood Cells – including	
	numbers and approximate length of life – position, structure and function of cells 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.	
2	**Unit II**	30 H
	Cardio-Vascular System – Introduction	
	Structure and properties of Heart Muscles and nerve supply of Heart.	
	Structure and functions of arteries, capillaries, and veins.	
	Cardiac cycle and Heart sound.	
	Cardiac output measurements, factors affecting Heart Rate and its regulation,	
	Cardio-vascular reflexes.	
	Blood pressure, its regulation, physiological variation, peripheral resistance, Factors Controlling Blood Pressure, Hemorrhage.	
	ECG study and stress test.	

	Respiratory System.	
	Mechanism of Respiration, Changes in diameter 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 changes in rate and depth, transportation of oxygen and carbon dioxide.	
3	**Unit: III**	30H
	Digestive System	
	General arrangement of alimentary canal, liver pancreas-position, structure, and functions.	
	Nutrition and Diet-carbohydrate, protein fat, salts, water, vitamins and minerals digestion, absorption, and Metabolism.	
	Reproductive System.	
	Sex determination and development of puberty, male sex hormones, spermatogenesis, Female sex hormones, menstrual cycle. Ovulation, pregnancy, Function of placenta, lactation.	
	Excretory System.	
	Gross and minute structures of kidney, renal circulation, Mechanism of formation of urine, Glomerular filtration rate and tubular function, renal function and renal tests. Physiology of micturition.	
4	**Unit: IV**	20H
	Endocrine System.	
	Structure and function of pituitary (anterior & posterior). Thyroid, Para-thyroid, adrenal cortex, adrenal medulla, Thymus and pancreas.	
	Blood sugar regulation.	
	Skin-Structure and functions.	

5	**NEUROMUSCULAR PHYSIOLOGY**	
	Unit: V	50H
	Cell membrane – Ionic and Potential gradient and transport.	
	Muscle – Types of muscular tissue – Gross and Microscopic structure – function. Basis of muscle contraction – changes in muscle contraction, Electrical – Biphasic and mono-phasic action potentials, chemical, Thermal, and physical changes, 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 Wallarian degeneration, electro tonus and Pflagers law.	
	Types and properties, of receptions, types of sensations, synapse, reflex, are its properties occlusion, summation, sub minimal fatigue etc.	
	Tracts – Ascending and descending and extra-pyramidal tracts,	
	Functions of E.E.G.	
	Functions of Cerebral cortex, cerebrum, cerebellum, Basal ganglia,	
	Thalamus – connection and functions.	
	Reticular formation – tone posture & equilibrium, Autonomic nervous system.	
	Special Senses Eye-Errors of refraction, equilibrium, Autonomic nervous system.	
	Speech and its disorders.	
	Ear and Vestibular apparatus, taste, olfactory, somatic sensations.	

SUBJECT: PHYSIOLOGY PRACTICAL

SUBJECT CODE: PHY191

CREDITS: 2

S. No.	Topics	Hours
	PRACTICAL PHYSIOLOGY/DEMONSTRATION	**40H**
1	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	20H
2	Examination of vital signs: a) Respiratory rate b) Pulse Rate c) Temperature d) Blood Pressure	10H
3	Effect of Exercises on body physiology	10H

Suggested Reading:

Textbooks

1. K. Sembulingam, Essentials of Medical Physiology, Jaypee, All Chapters
2. Concise Medical Physiology – Sujit K. Chowdhuri.
3. Textbook of physiology for physiotherapy – Prof. A. K Jain.

References

1. Guyton & Hall, Human physiology, Elsevier
2. Principles of Anatomy & Physiology – Tortora.
3. Samson & Wrights Applied physiology

SUBJECT: BIOCHEMISTRY
SUBJECT CODE: BCH101
CREDITS: 2

Course Objectives:

To gather conceptual knowledge of relevant sub-disciplines of biology and chemistry, including molecular and cell biology, genetics, organismal biology, organic, inorganic, analytical and physical chemistry, and biochemistry.

Course Outcomes (CO):

After taking this course a student will:

CO1: Demonstrate skills in both chemistry and biology.

CO2: Develop competence in scientific writing, which includes scientific critical thinking, ability to formulate and test a hypothesis and analysis of evidence and ability to draw conclusions.

Mapping of Course Outcomes (CO) and Program Outcomes (PO):

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1								
CO2								

Course Contents:

S. No.	Topics	Hours
1	**BIO-PHYSICS:** Concepts of Ph and buffers, Acid-base equilibrium, osmotic pressure and its physiological applications. **CELL:** Morphology, Structure and functions of cell, cell membrane, Nucleus, Chromatin, Mitochondria, endoplasmic reticulum, ribosome.	10H
2	**CARBOHYDRATES, LIPIDS & PROTEINS & METABOLISM:** Definition, functions, sources, classification & metabolism **VITAMINS:** Classification, Fat soluble vitamins A, D, E, K Water soluble vitamins-B Complex and Vitamin 'C', Daily requirement physiological functions and disease of vitamin deficiency;	10H
3	**BIO-ENERGETICS:** Concept of free energy change, Energetic reaction and endergenic reactions, Concepts regarding energy rich compounds. Respiratory chain and Biological oxidation. **WATER METABOLISM:** Fluid compartments, Daily intake and output, Dehydration, Sodium, and potassium Metabolism.	10H
4	**MINERAL METABOLISM:** Iron, Calcium, Phosphorous, Trace elements. **NUTRITION:** Nutritional aspects of carbohydrate, fat and proteins, Balanced diet, Metabolism in exercise and injury, Diet for	10H
	chronically ill and terminally ill patients. **CONNECTIVE TISSUE:** Mucopolysacharides, Connective tissue proteins, Glyco-proteins, Chemistry and Metabolism of bone and teeth.	

5	**NERVE TISSUE:** Composition, Metabolism, Chemical mediators of nerve activities. **MUSCLE TISSUE:** Structure, Metabolism of muscles, Muscle contraction. **HORMONES:** General Characteristic and Mechanism of Hormone actions	10H

Suggested Reading

Textbooks:

1. Damodaran, M. Vasudevan, Textbook of Biochemistry, Jaypee, All Chapters.
2. Biochemistry-by Dr. Deb Jyoti Das
3. Biochemistry-by-Dr. Satyanarayan

SUBJECT: ELECTROTHERAPY-I

SUBJECT CODE: ELT101 CREDITS: 4

Course Objectives:

This course is an ideal way to bring up to date with current procedures in this field. It will expand the knowledge of the underlying principles of modalities such as ultrasound and laser therapy and will enhance the ability to adapt 'standard' treatment protocols to the specific needs of each individual patient.

Course Outcomes (CO):

After taking this course a student will:

CO1: To consider the basic issues of each modality.

CO2: What the energy can (and cannot) do in terms of physiological & therapeutic effect. CO3: To relate these issues to both the research evidence & to the clinical application of each modality.

CO4: Explain the basic nature of the applied energy.

CO5: Identify the key physiological effects of the modality. CO6: Rationalize the main therapeutic effects.

CO7: Justify the appropriate clinical application. CO8: Establish appropriate clinical doses.

CO9: List the key contraindications, dangers & precautions. Mapping of Course Outcomes (CO) and Program Outcomes (PO):

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1		✓						✓
CO2		✓						✓
CO3		✓		✓				✓
CO4				✓			✓	✓
CO5				✓			✓	✓
CO6		✓		✓			✓	✓
CO7		✓		✓			✓	✓
CO8		✓		✓			✓	✓
CO9		✓		✓			✓	✓

Course Contents:

S. No.	Topics	Hours
1	Physical Properties: Structure and properties of matter-solids, liquids, and gases; adhesions, surface tension, viscosity, density, and elasticity. Structure of atom, molecules, elements, and compounds. Conductors, insulators, potential difference, Resistance, and Intensity. Ohm's Law – Its application to AC and DC a) Rectifying devices- thermionic valves, semiconductors, transistors, amplifiers, transducers, oscillator circuit. b) Capacitance, condensers and AC and Dc circuits c)	25H
	Display devices and indicators – analogue and digital Effects of current electricity: 1. Chemical effects -ions and electrolytes, ionization, production of EMF by chemical action. 2. Magnetic effects, molecular theory of magnetism, magnetic effects, electromagnetic induction. 3. Thermal effects- joule's law and heat production. 4. Milli-ammeter and voltmeter, transformers, and choke coil Physical principles of sound and its properties, Physical principles of light and its properties Electromagnetic spectrum- biophysical application.	
2	**Electrical Supply:** a) brief outline of mains supply of current. b) dangers- short circuit, electric shock. c) Precautions- safety devices, earthing, fuses etc. d) first aid and initial management of electric shock	15H

3	**Low frequency currents:** 1. Introduction to DC, AC, and modified currents 2. Production of DC- physiological and therapeutic effects of DC, anodal and cathodal galvanism. 3) Iontophoresis- principles of clinical application, indication, contraindication, precaution, operational skills of equipment and patient preparation. 4) Modified DC –various pulses, duration and frequency and their effects on nerve and muscle tissue. Production of IDC and surged currents and their effects, principle of clinical application, physiological and therapeutic effects, indication, contraindication, precaution, operational skills, equipment, and patient preparation. 5) TENS a) Types of low frequency, pulse widths, frequencies and intensities used as TENS application b) Theories of pain relief. c) Principle of clinical application, physiological and therapeutic effects, indication, contraindication, precaution, operational skills, equipment, and patient preparation.6) Sinusoidal currents, dynamic pulses.	35H
4	**Electrical Reactions and electro diagnostic tests:** Electric stimuli and normal behavior or nerve and muscle tissue. Types of lesion and development of reaction of degeneration. Faradic/ IDC test (FG test). SD curve and its application. Rheobase and chronaxie and pulse ratio.	20H
5	**Ultra-Violet Radiation:** a) Wavelength, frequency, types, and sources of UVR generation, techniques of irradiation, physiological and therapeutic effects, indication, contraindication, precaution, operational skills, equipment and patient preparation b) Dosage calculation of UVR.	20H
6	**Superficial heat – Infrared Radiation, Paraffin wax bath, moist heat, electrical heating pads, fluid therapy, contrast bath etc.** **IRR**-Wavelength, frequency, types and sources of IRR generation, techniques of irradiation, physiological and therapeutic effects, indication, contraindication, precaution, operational skills, equipment, and patient preparation **PWB** – contents, methods of application, maintenance of equipment,	35H

	indication, contraindication, precaution, operational skills, equipment, and patient preparation **Hydrocollator packs** – contents, methods of application, indication, contraindication, precaution.	

SUBJECT: ELECTROTHERAPY-I PRACTICAL

SUBJECT CODE: ELT191

CREDITS: 2

Course Contents:

S. No.	Topics	Hours
	PRACTICAL DEMONSTRATION	**50H**
1	To study the basic operation of electric supply to the equipment and Safety devices.	3H
2	To experience sensory and motor stimulation of nerves and muscles by various types of low frequency currents.	8H
3	To locate and stimulate different motor points region wise.	10H
4	Therapeutic application of different low frequency current, faradic foot bath, faradism under pressure/tension, iontophoresis.	12H
5	To plot SD curve, find rheobase and chronaxie	5H
6	To study hydrocollator units, its operations.	2H
7	To study different types of IRR and its application.	1H
8	To study PWB unit and its application.	2H
9	To study different types of UVR, their operation, assessment of test Dose and application.	2H
10	To study TENS stimulator, its operation and application.	5H

Suggested Reading:

Textbooks:

1) Basanta Kumar Nanda, Electrotherapy simplified, jaypee, all chapters.

2) Angela Forster, Clayton's Electrotherapy, CBS, all chapters.

3) Low and Reed – Electrotherapy Explained: Principles and Practise.

References

1) Jagmohan Singh – Textbook of Electrotherapy.

2) Kahn - Principles and Practices of Electrotherapy

3) Lehmann – Therapeutic Heat and Cold

SUBJECT: EXERCISE THERAPY-I

SUBJECT CODE: EXT101 CREDITS: 4

Course Objectives:

This area offers students a life span approach to physical fitness, performance, and health to prepare them for a career in the physical therapy field. Exercise therapy study is designed to expand upon information provided in the basic sciences of anatomy/physiology and chemistry. By design students learn about the effects of physical activity on children, then young adults, followed by geriatric populations. The exercise science majorly prepares students for a variety of possible careers in athletic training, physical therapy, fitness and sport enterprises, education, sport science & coaching Such occupations include, aerobics instructor, cardiopulmonary rehabilitation specialist, exercise physiologist, occupational physiologist, personal trainer, strength, and conditioning specialist and more.

Course Outcomes (CO):

After taking this course a student will:

CO1: Demonstrate a sound foundational knowledge and understanding of the principles of biology, chemistry, and nutrition, and an advanced understanding of human anatomy and physiology as they relate to responses and adaptations to physical activity and exercise.

CO2: Demonstrate basic laboratory skills pertaining to assessments, laboratory methods, sound experimental and analytical practices, data acquisition and reporting in the exercise sciences.

CO3: Demonstrate knowledge of the importance and influence of physical activity, kinesiology, nutrition, and exercise on health and be an advocate for physically active lifestyles as a means to improve quality of life and reduce the risk and prevalence of lifestyle related diseases.

CO4: Plan, administer, and evaluate wellness and fitness programs, nutrition projects, and exercise physiology tracks based in sport, clinical, industrial, and/or corporate environments. CO5: Demonstrate requisite skills and abilities for meaningful employment in exercise science related areas or pursue graduate studies in an exercise therapy related area.

Course Contents:

S. No.	Topics	Hours
1	Basic physics in exercise therapy. Mechanics: Force, Gravity, line of gravity, center of gravity in human body, Base, equilibrium, Axes and Planes, mechanical principles of lever, examples in human body, Pendulum, spring.	15H
	Introduction to exercise therapy.	
2	Massage: Definition of massage, type of massage, general effect and uses 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. Suspension therapy: Principles of suspension, types of suspension therapy, effects and uses of suspension therapy-their applicat5ion either to mobilize a joint increase joint range of motion or to increase muscle power-explaining the full details of components used for suspension therapy.	35H
3	Starting position-Fundamental starting position-standing, sitting, kneeling, lying and-hanging. All the derived positions of the above five fundamental starting positions. Classification movements in details: Voluntary movement: free exercise, assisted exercises, resisted exercise, Active-Assisted and Resisted exercise. Assisted Exercises: Technique and uses. Free exercises-Classification, technique, effects of frequent exercises on various systems etc. Resisted exercises – Techniques and types of resistance, SET system (Heavy resisted exercises, Oxford method, De Lorme method, Mc queen method. Relaxed passive movements, basic knowledge of classification of	35H

	relaxed passive movements, definition, technique, effects and uses of relaxed passive movement.	
4	Muscle's strength: Anatomy and physiology of muscle tissue causes of muscle weakness paralysis, prevention of muscle weakness/paralysis Type of muscle work and contraction ranges of muscle work, prevention of muscle atrophy. Muscle assessment M.R.C. grading Principles of muscle strengthening/re-education, early re-education of a paralyzed muscle etc. Joint Movement and measurement: Goniometry. Classification of joint movements causes of restriction of joint movement, Principle, and application of Goniometry.	35H
5	Bed Rest-Its necessity & Complications. Motor Learning and motor control a) Introduction to motor learning, classification of motor skills, measurement of performance b) Theories of motor control and applications. c) Learning of skill, theories of feedback, practice conditions. Relaxation and Therapeutic Gymnasium • Describe relaxation, muscle fatigue, muscle spasm and tension. • Factors contributing to fatigue and relaxation. • Techniques of relaxation. • Effects and uses, indications and contraindications. • Set up of gymnasium and its importance. • Various equipment in the gymnasium	30H

SUBJECT: EXERCISE THERAPY-I PRACTICAL

SUBJECT CODE: EXT191

CREDITS: 2

Course Contents:

S. No.	Topics	Hours
	PRACTICAL EXERCISE THERAPY – I / DEMONSTRATION	**50H**
1	Massage Therapy	7H
2	Suspension Therapy	3H
3	Relax passive movement/types of exercise	5H
4	MMT	10H
5	Goniometry	10H
6	Relaxation techniques- general and local	5H
7	Fundamental and derived positions	5H
8	Application of relaxed passive movements, active assisted and resisted movements to all joints in limbs.	5H

Suggested Reading:

Textbooks:

1. M. Dena Gardiner, Principles of Exercise Therapy. CBS, all chapters.
2. Massage- Hollis.
3. Therapeutic Exercise Colby Kisner

References

1. Therapeutic Exercises- foundations and Techniques- Kisner and Colby.
2. Muscle Testing and Function- Kendall
3. Principles of exercise therapy – Gardiner.
4. Practical Exercise Therapy – Hollis.
5. Beard's Massage – Wood.
6. Motor control- theory and practical application- Shumway.
7. Hydrotherapy – Principles and practice – Campion.\
8. Measurement of Joint Motion – A guide to goniometry – Norkin and White Davis

SUBJECT: BIOMECHANICS & KINESIOLOGY

SUBJECT CODE: BIK201

CREDITS: 4

Course Objectives:

Kinesiology is not studied merely to incite our interest in a fascinating and mysterious subject. It has a useful purpose. We study kinesiology to improve performance by learning how to analyze the movements of the human body and to discover their underlying principles. The study of kinesiology is an essential part of the educational experience of students of physical education, dance, sport, and physical medicine. Knowledge of kinesiology has a threefold purpose for practitioners in any of these fields. It should enable them to help their students or clients.

Course Outcomes (CO):

After taking this course a student will:

CO1: Define kinesiology and explain its importance to the student of human motion. CO2: Describe the major components of a kinesiological analysis.

CO3: Prepare a description of a selected motor skill, breaking it down into component phasesand identifying starting and ending points.

CO4: Determine the simultaneous-sequential nature of a variety of movement skills.CO5: Classify motor skills using the classification system presented.

CO6: State the mechanical purpose of a variety of movement skills.

CO7: Utilize methods of observation and palpation to identify the joints and basic muscle groupsactive in a movement skill.

Mapping of Course Outcomes (CO) and Program Outcomes (PO):

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
CO1								
CO2								
CO3								
CO4								
CO5								
CO6								
CO7								

Course Contents:

S. No.	Topics	Hours
1	**Essential Concepts**	15H
	a. Motion and forces, Axis and planes, Mechanical lever, lever in Human body.	
	b. Force distribution-linear force, resultant force & equilibrium, parallel forces in one plan concurrent force.	
	c. Newton‟s law – Gravity and its effects on human body	
	d. Forces and moments in action	
	e. Concepts of static equilibrium and dynamic equilibrium	
	f. Composition and resolution of forces	
	g. Friction	
	i. Pulleys.	
2	**Joint Structure and Functions**	10H
	a. Basic Principles of joint structure and function.	
	b. Tissues present in and around joints including fibrous tissue, bone cartilage, connective tissue, ligaments, tendons etc.	
	c. Classification of joints.	
3	**Muscle Structure and Functions**	15H
	a. Mobility and Stability functions of muscle	
	b. Elements of muscle structures and its properties.	
	c. Types of muscle contraction and muscle work.	
	d. Classification of muscles and their functions	
	e. Group action of muscles, coordinated movement.	
4	**Kinematics and Kinetics Concepts of**	25H
	a. Upper Extremity	
	i) Scapulo-shoulder Joint	
	ii) Elbow Joint	
	iii) Wrist Joint & Hand	
	b. Lower Extremity	
	i) Hip & pelvis	
	ii) Knee joint	
	iii) Patello femoral joint	
	iv) Ankle and foot	
	c. Temporomandibular joint	
5	**Biomechanics of vertebral column**	10H
6	**Biomechanics of Gait:**	15H

	a. Gait cycle	
	b. Spatio-temporal parameters of gait	
	c. Kinematics and Kinetics of human gait	
	d. Determinants of gait	
	e. Gait deviations in various orthopedic/neurological conditions	
7	**Posture:**	10H
	a. Anatomical aspects of posture	
	b. Factors affecting posture	
	c. Assessment of Posture	
	d. Types of Posture	
	e. Postural deviation	

Suggested Reading:

Textbook:

1. Joint Structure and Function- Cynthia Norkins & Pamela Lavengie.
2. Kinesiology: The Mechanics and Pathomechanics of Human Movement, Carol A. Oatis, Jaypee, All chapters.

Reference**:**

1. Fundamentals of biomechanics- Nihatozkaya, Margareta nordin

1. Essential Courses:

Biomechanics By Prof. Varadhan | IIT Madras |
https://onlinecourses.nptel.ac.in/noc23_bt04/preview

2. Anthropometry, Biomechanics, and Motor Skills in User Design | Arizona State University
https://www.coursera.org/learn/anthropometry-biomechanics-and-motorskills-in-user-design

SUBJECT: COMMUNITY MEDICINE
SUBJECT CODE: COM201 CREDITS: 4

Course Objectives:

1) Help Students understand health and potential interventions from a community/consumer perspective.

2) Provide opportunities for Students to develop skills in working collaboratively when addressing health issues.

3) Help community partners understand and use research skills to advance their own missions.

4) Experience the translation of research into action. Instill in students a sense of responsibility to the communities in which they work.

5) Take the skills developed through the community project to other settings in which the students may practice in the future.

Course Outcomes (CO):

After taking this course a student will:

CO1: Education and training in community-based and collaborative research that will have transferability to other settings.

CO2: Strengthening relationships in the benefit of community-based projects of current and future students.

CO3: Advancing knowledge on community research experiences in a scholarly manuscript. Mapping of

Course Contents:

S. No.	Topics	Hours
1	General concepts of health diseases, with reference to natural history of disease with pro-pathogenic and pathogenic phases. The role of socio-economic and cultural environment in health and disease. Epidemiology, definition, and scope.	10H
2	Public health administration an overview of the health administration set up at Central and state levels.	8H
3	The national health program -highlighting the role of social, economic, and cultural factors in the implementation of the national program.	8H
4	Health problems of vulnerable groups-pregnant and lactating women, infants and pre-school children, occupational groups.	8H
5	Occupational Health-definition, scope occupational disease prevention of occupational disease and hazards.	6H
6	Social security and other measurement for the protection from occupational hazard accident and diseases. Details of compensation acts.	8H
7	Family planning – objectives of national family planning programs and family methods. A general idea of advantage and disadvantages of the methods.	8H
8	Mental health emphasis on community aspects of mental, role of Physiotherapy in mental health problems such as mental retardation etc.	6H
9	Communicable disease- an overall view of communicable disease classifies according to principal mode of transmission role of insect and other factors.	8H
10	International health agencies.	6H
11	Community medicine and rehabilitation epidemiology, habitat, nutrition, environment anthropology. a) The philosophy and need of rehabilitation	18H

	b) Principles of physical medicine c) Basic principles of administration or organization.	
12	Introduction to community health.	6H

Suggested Reading:

Textbook:

1. K. Park – Park‟s Textbook of Preventive & Social Medicine.

Essential Courses:

1. https://onlinecourses.swayam2.ac.in/nou24_es06/preview
2. https://www.coursera.org/learn/mental-health
3. https://www.coursera.org/learn/non-communicable-diseases-in-humanitarian-settings

SUBJECT: ELECTROTHERAPY-II

SUBJECT CODE: ELT201 CREDITS: 4

Course Objective:

This course is an ideal way to bring up to date with current procedures in this field. It will expand the knowledge of the underlying principles of modalities such as ultrasound and laser therapy and will enhance the ability to adapt „standard" treatment protocols to the specific needs of each individual patient.

Course Outcomes (CO):

After taking this course a student will:

CO1: To consider the basic issues of each modality.

CO2: What the energy can (and cannot) do in terms of physiological & therapeutic effect. CO3: To relate these issues to both the research evidence & to the clinical application of eachmodality. CO4: Explain the basic nature of the applied energy.

CO5: Identify the key physiological effects of the modality. CO6: Rationalize the main therapeutic effects.

CO7: Justify the appropriate clinical application. CO8: Establish appropriate clinical doses.

CO9: List the key contraindications, dangers & precautions.

Course Contents:

S. No.	Topics	Hours
1	**MEDIUM FREQUENCY CURRENT (interferential current)**	10H
	Definition, characteristics, physiological/therapeutic effect of I.F current, indication, technique of application, contraindication, and precaution.	
2	**HIGH FREQUENCY CURRENT**	20H
	a. SHORT WAVE DIATHERMY - Introduction, physiological effect and therapeutic effect of SWD, method of application (capacitor field method and Cable method etc.) Technique of treatment, indication, contraindication and Dangers.	
	b. PULSED SWD - Definition, characteristics, mechanism of work, physiological effect and therapeutic effects, indications, techniques of application, principle of treatment and contraindication.	
	c. MICROWAVE DIATHERMY -	
	Introduction and characteristics.	
	Physiological effect.	
	Therapeutic effect	
	Techniques of application and principle of treatment.	
	Dangers of microwave diathermy	
3	**LASER**	10H
	Introduction and characteristics.	
	Effect on tissue.	
	Therapeutic effect	
	Indication, contraindication, and dangers.	
4	**ULTRASONIC THERAPY**	15H
	Introduction and characteristics.	
	U.S therapy parameters.	
	Coupling media	
	Therapeutic effects.	

	Indications, contraindications, and dangers.	
	Testing of apparatus	
	Technique of application and dosage	
5	**CRYOTHERAPY**	10H
	Introduction, physical principles	
	Physiological effects	
	Indication and contraindication	
	Therapeutic effects and technique of application	
6	**BIO-FEEDBACK**	15H
	Introduction, principles of biofeedback	
	Therapeutic effects of biofeedback	
	Indication and contraindication	
	Technique of treatment	
7	**Electro diagnosis**- EMG techniques, Iontophoresis etc.	10H
8	**ADVANCED ELECTROTHERAPY**	10H
	Combined therapy-principle, therapeutic uses, and indication like U.S therapy with stimulation or TENS etc.	

SUBJECT: ELECTROTHERAPY-II PRACTICAL

SUBJECT CODE: ELT291

CREDITS: 2

S. No.	Topics	Hours
1	Testing of Electrotherapy apparatus**.**	10H
2	Technique of application of electrotherapy treatment modalities (demonstration and practice).	50H
3	Electro-diagnosis (demonstration and practice of following electro-diagnostic measures) a. F.G test	20H
4	Observe EMG and NCV- demonstration only	10H
5	Observe Biofeedback Unit.	10H

Suggested Readings:

Textbooks:

1) Basanta Kumar Nanda, Electrotherapy simplified, jaypee, all chapters.

2) Angela Forster, Clayton‟s Electrotherapy, CBS, all chapters.

References:

1) Low and Reed – Electrotherapy Explained: Principles and Practice

2) Jagmohan Singh – Textbook of Electrotherapy.

3) Kahn - Principles and Practices of Electrotherapy

4) Lehmann – Therapeutic Heat and Cold

SUBJECT: EXERCISE THERAPY-II
SUBJECT CODE: EXT201 CREDITS: 4

Course Objective:

This area offers students a life span approach to physical fitness, performance, and health to prepare them for a career in the physical therapy field. Exercise therapy study is designed to expand upon information provided in the basic sciences of anatomy/physiology and chemistry. By design students learn about the effects of physical activity on children, then young adults, followed by geriatric populations. The exercise science majorly prepares students for a variety of possible careers in athletic training, physical therapy, fitness and sport enterprises, education, sport science & coaching Such occupations include, aerobics instructor, cardiopulmonary rehabilitation specialist, exercise physiologist, occupational physiologist, personal trainer, strength, and conditioning specialist and more.

Course Outcomes (CO):

After taking this course a student will:

CO1: Demonstrate a sound foundational knowledge and understanding of the principles of biology, chemistry, and nutrition, and an advanced understanding of human anatomy and physiology as they relate to responses and adaptations to physical activity and exercise.

CO2: Demonstrate basic laboratory skills pertaining to assessments, laboratory methods, sound experimental and analytical practices, data acquisition and reporting in the exercise sciences.

CO3: Demonstrate knowledge of the importance and influence of physical activity, kinesiology, nutrition, and exercise on health and be an advocate for physically active lifestyles as a means to improve quality of life and reduce the risk and prevalence of lifestyle related diseases.

CO4: Plan, administer, and evaluate wellness and fitness programs, nutrition projects, and exercise physiology tracks based in sport, clinical, industrial, and/or corporate environments. CO5: Demonstrate requisite skills and abilities for meaningful employment in exercise science related areas or pursue graduate studies in an exercise therapy related area.

Course Contents:

S. No.	Topics	Hours
1	Therapeutic exercises – impact on physical function, classification, techniques, indications, contraindications, assessment, and evaluation of patient.	15H
	Range of motion & types of ROM exercises. Resistance exercises and adaptation of skeletal muscles.	
2	Principles of aerobic exercises & its physiological response, testing as basis of aerobic program. Determinants of exercise program. Stretching Techniques and its determinants. Peripheral and spinal joint mobilization techniques. Individual, group and mass exercises, maintenance exercises, plan of exercise-therapy tables and schemes	25H
3	Functional Re-education- techniques to re-educate ADL functions. Principles of Traction, physiological and therapeutic effects, classification, types, indications, contraindications, techniques of application, operational skills, and precautions. Taping and bandaging techniques. P.N.F: Detail theory of proprioceptive neuro muscular facilitation techniques.Co-ordination Exercises: Definition of coordination movements. Uncoordinated movements, Factors for coordinated movements, technique of coordination exercises. Techniques to improve static and dynamic balance.	26H
4	Posture: Types, factors responsible for good posture, factors for poor posture, principles of development of good posture, assessment of Posture. Gait: Analysis of normal gait with muscle work, various pathological gaits. 2point, 3point & 4point gait: Introduction, crutch measurement, crutch balance, various types of crutch gait in details. Breathing exercises: Physiology of respiration, types of breathing exercises,	20H

	technique if various types of breathing excises, its effects and uses. Pulmonary exercises & postural drainage	
5	Hydrotherapy: Introduction, various types of hydrotherapy units, construction and equipment used in hydrotherapy Principles, indications, contraindication, effects and uses of hydrotherapy. Precautions towards patient, towards therapist, equipment unit etc. Exercises for normal person – Importance and effects of exercise to maintain optimal health and its role in prevention of disease. Exercise prescription for different age groups/ occupational demands etc. Yoga-Definition-History-Principles-Concepts, General effects of yogic posture on the body.	14H

SUBJECT: EXERCISE THERAPY-II PRACTICAL SUBJECT

CODE: EXT291

CREDITS: 2

Course Contents:

S.No.	Topics	Hours
1	Assessment and evaluative procedures including motor, sensory, neuromotor. Coordination, vital capacity, limb length.	10H
2	Resistive Exercise.	10H
3	Range of motion exercise.	10H
4	Stretching.	10H
5	Traction techniques.	5H
6	Functional re-education.	10H
7	Taping and bandaging techniques.	5H
8	Assessment of Posture using plumb line.	5H
9	Assess and evaluate equilibrium/ balance and techniques to improve balance.	5H
10	Peripheral Joint Mobilization techniques.	10H
11	Breathing exercise and postural drainage	10H
12	Gait and crutch walking	5H
13	Application of PNF techniques and patterns.	5H

Suggested Reading:

Textbooks:

1. M. Dena Gardiner, Principles of Exercise Therapy. CBS, all chapters.
2. Progressive resisted exercises – by Margaret Hollis
3. Therapeutic Exercises- foundations and Techniques- Kisner and Colby.

References:

1.. Muscle Testing and Function- Kendall
2. Practical Exercise Therapy – Hollis.
3. Beard‟s Massage – Wood.
4. Motor control- theory and practical application- Shumway.
5. Hydrotherapy – Principles and practice – Campion.
6. Measurement of Joint Motion – A guide to goniometry – Norkin and White Davis.
7. PNF – Knott and Voss

SUBJECT: PATHOLOGY & MICROBIOLOGY SUBJECT CODE:

PAM201

CREDITS: 4

Course Objectives:

Demonstrate an investigative and analytic approach to clinical and pathological problems. Demonstrate applied knowledge of Pathology, by describing the four aspects of the major disease processes covered in the course:

1) Cause (etiology)
2) Mechanisms of development (pathogenesis)
3) Functional consequences of the molecular and morphologic changes (clinical significance)
4) Apply the basic and clinically supportive sciences appropriate to pathology (such as anatomy, biochemistry, histology/histopathology, cytogenetic, and physiology).

Course Outcomes (CO):

After taking this course a student will:

CO1: Gather and apply essential information from patient cases necessary to discuss clinic-pathologic processes in Small Group Discussions.

CO2: Develop a differential diagnosis when presented with clinical information or a histo-pathologic finding.

CO3: Utilize laboratory studies to diagnose and monitor disease states and conditions. CO4: Demonstrate the ability to support self-education (i.e., active learning).

CO5: Demonstrate the ability to find additional information when confronted with a question or unfamiliar term, particularly when preparing for case-based exercises.

CO6: Investigates new and exciting material about microbes and our world, including health concerns, microbial anatomy and physiology, genetics, epidemiology, and use of antimicrobialsand disinfectants.

CO7: Compare and contrast the characteristics for various microbes with regards to infections, treatment, and control. (This includes prions, viruses, bacteria, protozoans, and multicellular parasites) CO8: Explain the dynamics of commensal, opportunistic, and pathological relationships particularly between microbes and humans.

CO9: Evaluate and apply the proper methods of microbial control necessary in sample scenariosor case studies.

CO10: Describe microbial metabolic pathways in general terms and specifically evaluate the implications for food production and human disease.

Course Contents:

S. No.	Topics	Hours
	PATHOLOGY	
1	Aims and objectives of study of pathology.	2H
2	Brief outline of cell injury, degeneration, necrosis, and gangrene.	3H
3	Inflammation: Definition, vascular and cellular phenomenon difference between Transudate and exudates. Granuloma.	4H
4	Circulatory disturbances: Hemorrhage, Embolism Thrombosis Infraction, shock, Volkmann‟s ischemic contracture.	4H
5	Blood disorder: Anemia, Bleeding disorder.	3H
6	CVS: Heart and Blood vessels, Coronary heart disease.	3H
7	Respiratory System: Ch. Bronchitis, Asthma Bronchiectasis, Emphysema, COPD etc.	5H
8	Bones and Muscles: Arthritis & Spondyloarthropathy.	3H
9	PNS and Muscles: Neuropathies, Poliomyelitis & Myopathies etc.	4H
10	CNS: Infection, Demyelinating disease, Degenerative disease etc.	4H
11	Neoplasia.	3H
12	Growth and its disorders like hypertrophy hyperplasia & atrophy.	3H
13	Autoimmune diseases.	3H
14	Healing and repair.	3H
15	Diabetes mellitus and gout	3H

	MICROBIOLOGY	
1	Introduction and History of Microbiology	3H
2	General lectures on Microorganisms (brief).	3H
3	Sterilization and asepsis.	3H
4	Infection- Source of infection and Entry and its Spread	4H
5	Immunity- Natural and Acquired	4H
6	Allergy and hypersensitivity.	3H
7	Outline of common pathogenic bacteria and diseases produced by them. Respiratory tract infections. Meningitis. Enteric infections. Anaerobic infections. Urinary tract infections. Leprosy, tuberculosis, and miscellaneous infections. Wound infections. Sexually transmitted diseases. Hospital acquired infections.	22H
8	Virology- virus infections with special mention of Hepatitis.	4H
9	Poliomyelitis & rabies.	4H

Suggested Reading:

Textbook:

1) Textbook of Pathology, Harsh Mohan, Ivan Damjanov, Jaypee,
2) Textbook of Microbiology, R. Ananthanarayan, All chapters.
3) General Pathology – by Bhende

SUBJECT: PHARMACOLOGY SUBJECT CODE: PHA201 CREDITS: 4

Course Objectives:

This course introduces the student to basic pharmacology of common drugs used, their importance in the overall treatment including Physiotherapy. The student after completing the course will be able to understand the general principles of drug action and the handling of drugs by the body. The student will be aware of the contribution of both drug and physiotherapy factors in the outcome of treatment.

Course Outcomes (CO):

After taking this course a student will:

CO1: Possess a relevant knowledge in basic principles of pharmacology and its recent advances.
CO2: Understand the basic pharmacology of common drugs used, their importance in the overall treatment including Physiotherapy.

CO3: Understand the general principles of drug action and the handling of drugs by the body.
CO4: Understand the contribution of both drug and physiotherapy factors in the outcome of treatment.

Course Contents:

S. No.	Topics	Hours
1	General Pharmacology: Introduction and definitions, Nature, and sources of drugs: Dosage forms of drugs. Routes of drug administration, Pharmacokinetics (Absorption, Bioavailability, Distribution, Metabolism Excretion, first order Zero order Kinetics); Pharmacodynamics (sites and mechanisms of drug action in brief, Adverse drug reactions, Margin of safety of drugs and factors influencing dosage and drug response)	12H
2	Drugs Affecting ANS: General Introduction, Drug affecting parasympathetic nervous system, Drug affecting sympathetic nervous systems.	10H
3	Drugs Affecting Peripheral (Somatic) nervous System: Skeletal Muscle Relaxants: Local Anesthetics.	10H
4	Renal and CVS: Diuretics; Renin-angiotensin system and its inhibitors, Drug treatment of Hypertension, Angina pectoris, Myocardial infarction Heart failure, and hypercholesterolemia.	10H
5	Anti-inflammatory drugs and related autacoids: Histamine, Bradykinin, 5-HT, and their antagonists; Prostaglandin‟s and leukotriene; Non-steroidal Anti-inflammatory drug, Anti-rheumatic drugs and drugs used in gout.	10H
6	Drugs Affecting CNS: General anesthetics, Anxiolytics; Alcohol, Opioid analgesics. Drug dependence and abuse Antiepileptic drugs, Drug therapy for neurodegenerative disorders.	10H
7	Endocrines: Parathyroid hormone, Vitamin D, calcitonin, and drugs affecting Calcium balance, Thyroid and anti-thyroid drugs; Adrenocortical and anabolic steroids, Insulin and Oral Hypoglycemic agents.	10H
8	Drugs Affecting Respiratory System: Drug therapy of bronchial asthma and chronic obstructive pulmonary disease.	10H
9	Chemotherapy: Introduction; sulfonamides, Fluor quinolones, Penicillin, Cephalosporin, newer B-lactam antibiotic, aminoglycosides Macrolides and Newer antibiotics, Tetracycline Chloramphenicol, Chemotherapy of	10H

	Tuberculosis and leprosy, antiseptics-disinfectants.	
10	Miscellaneous Topics: Management of stroke, Toxicology and heavy metal poisoning, special aspects of pediatric and geriatric pharmacology; Drug interactions with drugs commonly used by physiotherapists; Hematinic, vitamins and antioxidants.	8H

Suggested Reading:
Textbook:

1. Essentials of Medical Phramacology, K.D. Tripathi, Jaypee
2. Pharmacology and Pharmaco therapeutics – R.S. Satoskar.

References:

1. Medical Pharmacology by Drill
2. Pharmacology principle of Medical practice – by Krantx & Carr

SUBJECT: COMMUNITY PHYSIOTHERAPY & REHABILITATION -I

SUBJECT CODE: CLR301

CREDITS: 4

Course Objectives:

This course introduces the student to education and prevention from various disabilities.

The students will be able to learn about clinical rehabilitation protocol.

Course Outcomes (CO):

After taking this course a student will:

CO1: Be able to understand the phase of disability process, explanation of its aims and principles.

CO2: Be able to find the phase of disability process, explanation of its aims and principles.

CO3: Be able to understand legislations for rehabilitation services for the disabled and P.W.D. acts & recent amendments.

CO4: Be able to know the contribution of social workers towards rehabilitation.

CO5: Be able to describe the principles of Management at the Medical Intensive Care Unit.

CO6: Acquire knowledge in vocational evaluation & goals for disabled, role of vocational counselor.

CO7: Be able to describe behavioral problems in the disabled, and its principle of management.

CO8: Be able to describe socio-economic rehabilitation: Outline of social implications of disability for the individual and for the community pre-vocational evaluation & role of V.C.GOVT. & NGO.

CO9: Discuss methods and team involvement in pre-vocational evaluation and training.

Course Contents:

S. No.	Topics	Hours
1	Introduction to rehabilitation medicine. Definition concerned in the phase of disability process, explanation of it aims and Principles, Scope of rehabilitation. Definition concerned with the causes of impairment functional limitation and disability. Disability prevention, limitation, and rehabilitation. Present rehabilitation Services.	**20H**
2	Legislations for rehabilitation services for the disabled & P.W.D acts & recent amendments. Legislations for rehabilitation services for the disabled and P.W.D. acts & recent amendments. Rehabilitation team and its members, their role. Community & rehabilitation including C.B.R., Advantages of C.B.R over I.B.R. Contribution of social worker towards rehabilitation. Vocational evaluation & goals For disabled, role of vocational counselor.	**30H**
3	Rural rehabilitation incorporated with primary health center. Principles of communication & its problems & management. Behavioral problems in the disabled its principle of management. And principals to overcome these. Architectural barriers possible modifications i n relation to different disabled conditions. Achieving functional independence, Home Evaluation.	**20H**
4	Occupational rehabilitation. Concepts in geriatric rehabilitation. Disability evaluation. Visual disability: definition and classification, mobility techniques, communication skills, prevention of blindness. Socio-economic rehabilitation: -Outline of social implications of disability for the individual and for the community pre- vocational evaluation & role of Vocational center govt. & NGO. Discuss Methods and team involvement in pre-vocational evaluation and training.	**30H**

5	Ergonomics: Injuries due to ergonomic alteration Ergonomic evaluation of workplace-mechanical stresses due to sedentary table work executives, clerk, inappropriate seating arrangement- vehicle drivers; constant standing- watchman-Defense forces, surgeon; Over-exertion in laborers, common accidents. Role of P.T.-in Industrial setup & Stress management-relaxation modes psychological hazards-e.g.-executives, monotonicity & dissatisfaction in job, anxiety of work completion with quality	10H

Practical

No.	Topics	Hours
1.	Assessment and Evaluation of Disability Using Standard Tools) (Disability Evaluation PWD act)	4H
2.	Home and Workplace Ergonomic Assessment with Modifications (including REBA/RULA application and adaptive equipment)	6H
3.	Geriatric and Occupational Rehabilitation Planning	6H
4.	Home modification assessment, home evaluation and recommendation plan	8H

Suggested Reading:

1. Textbook of Clinical Rehabilitation- S. Sunder
2. Orthotics in Rehabilitation : Mckee and Morgan – F. A. Davis
3. Orthotics and prosthetic and assistive devices for physiotherapists by sinha, sharma and tripathy jaypee brothers
4. Park's Textbook of Preventive & Social Medicine - K.Park
5. Physical Rehabilitation – Assessment and Treatment – Sullivan & Schmitz F. A. Davis.
6. Occupational Therapy and Physical Dysfunction. Principles, Skills and Practices – Hand Splinting- Tuner, Forster & Johnson – Churchill Living- stone
7. Piyush Gupta O.P.Ghai; T.B. of Preventive & social medicine 2nd edition CBS publishers & distributors 2007.

Recommended Reference Books for CPTR

1. Status of Disabled in India -2000-RCI publication
2. Legal Rights of disabled in India- Gautam Bannerjee
3. ICF –WHO Health Organisation 2001 publication
4. Training in the Community for the people with disability – Hallender Padmini
5. Mendes
6. Disabled Village Children—David Werner
7. Chorin C& M Desai, C Gonsalves, Women & the Law, Vol. I & II Socio - legal Information Centre Mumbai
8. Hand Splinting – Wilson – W. B. Saunders.
9. Atlas of Limb Orthotics and Limb Prosthetics American Academy of Orthopedic Surgeons – Mosby.
10. Krusens Handbook of Physical Medicine and Rehabilitation

SUBJECT: CLINICAL ORTHOPEDICS
SUBJECT CODE: CLO301
CREDITS: 4

Course Objectives:

This course introduces and enables the student to understand orthopedic conditions which commonly cause disability and their medical and surgical management. The students will be able to integrate the knowledge gained in clinical orthopedics with skills gained to apply these in clinical situations of dysfunction and Musculo-skeletal pathology.

Course Outcomes (CO):

After taking this course a student will:

CO1: Understand the basic orthopedic conditions which commonly cause disability and their management.

CO2: Know the aetiology, Classification, Pathology, Clinical Features, Relevant Investigations, Complications, Surgical & Non-Surgical Management of various Orthopedic Conditions.

Course Contents

S. No.	Topics	Hours
1	**Unit I- Orthopedic Introduction** Fractures and dislocations of upper limb, lower limb, and spine Radiological Examination	25 H
2	**Unit II – Deformities** Common congenital and acquired deformities of foot, knee, hip, shoulder, elbow, and wrist including hand and spine. Infective conditions and lesions of joints and bones. Osteomyelitis, tuberculosis, pyogenic infection. T.B. Joints. Pediatrics Musculo-skeletal conditions and management	25 H
3	**Unit III - Arthritis** Osteoarthritis, Rheumatoid arthritis, cervical and lumbar spondylosis, Ankylosing spondylitis. Neck and Low back ache, Sciatica, PIVD, Brachial Neuralgia	15 H
4	**Unit IV - Soft tissue Involvement** Sprains, Strains, Tenosynovitis, and Contractures. Peripheral nerve injuries-their management. Sports Injuries and its management	10 H
5	**Unit V- Surgical Procedures** Amputation Common sites, causes & management Arthroplasty of joints, joint replacement (total and partial) Osteotomy, Reconstructive surgeries for rehabilitation of Poliomyelitis, Leprosy, Crush injuries, Principle of Tendon transfer and its procedure. Trauma and trauma care	15 H
6	Unit VI - **Bone and Joint Tumors** Classification, Clinical features and Management of Benign and Malignant bone and joint tumors.	10 H

SUBJECT: CLINICAL ORTHOPEDICS PRACTICAL
SUBJECT CODE: CLO391
CREDITS: 2

PRACTICAL

1. Assessment and Evaluation of various conditions
2. Case demonstration of various conditions, Exposure to various orthopedics techniques & procedures.
3. General viva.

Suggested Reading:

Textbook:

1. Textbook of Orthopedics- Maheswari.
2. Textbook of Orthopedics and Traumatology- M.N. Natarajan
3. Apley`s textbook of Orthopedics

References:

1. Outline of Fractures – John Crawford Adams.
2. Outline of Orthopedics- John Crawford Adams.

SUBJECT: MEDICINE AND PEDIATRICS
SUBJECT CODE: MEP301
CREDITS: 4

Course Objectives:

This course introduces the student to education and training in medicine, pediatric and psychiatric that will have transferability to other settings. The students will be able to describe neuromuscular, musculoskeletal, cardio-vascular & pulmonary conditions related to immunological conditions, nutritional deficiencies, infectious diseases, & genetically transmitted conditions.

Course Outcomes (CO):

After taking this course a student will:

CO1: Be able to describe Etiology, Pathophysiology, Signs & Symptoms & Management of the various Endocrinal, Metabolic, and Geriatric & Nutrition Deficiency conditions

CO2: Be able to describe Etiology, Pathophysiology, Signs & Symptoms, Clinical Evaluation & Management of the various rheumatological Cardiovascular, Respiratory & Neurological Conditions CO3: Acquire skill of clinical examination of Musculoskeletal, Pulmonary, cardiovascular & Neurological System.

CO4: Be able to interpret auscultation findings with special emphasis to pulmonary system, Chest X-ray, Blood gas analysis, P.F.T. findings, Blood studies done for Neurological & rheumatological conditions

CO5: Be able to describe the principles of Management at the Medical Intensive Care Unit. CO6: Acquire knowledge in brief about intra-uterine development of the fetus.

CO7: Be able to describe normal development & growth of a child, importance of Immunization & breastfeeding.

CO8: Be able to describe neuromuscular, musculoskeletal, cardio-vascular & pulmonary conditions related to immunological conditions, nutritional deficiencies, infectious diseases, & genetically transmitted conditions.

CO9: Acquire skill of clinical examination of a neonate /child with respect to neurological, musculoskeletal & respiratory function.

Course Contents:

S. No.	Topics	Hours
1	**Unit I (Medicine)**	20 H
	Introducing of Medicine.	
	Diseases of Respiratory System, Physiology, clinical presentation in relation to Chronic obstructive pulmonary disease, Bronchial asthma Pneumonia Bronchiectasis, Pleural effusion & Empyema thoracis Pneumothorax	
	Diseases of Kidney, Physiology, clinical presentation in relation to ARF CRF	
	Hematological Diseases. Anemia Physiology, clinical presentation in relation to Hemophilia	
	Endocrine & Metabolic Diseases. Vit. D & Calcium metal & parathyroid gland disorders	
2	**Unit II**	28 H
	Nutritional Diseases Physiology, clinical presentation in relation to Obesity	
	Connective Tissue Diseases, Physiology, clinical presentation in relation to Rheumatoid arthritis, Gout & other connective tissue disorders	
	Infectious Diseases: Tetanus Leprosy HIV & AIDS	
	Psychiatric Disorders: Classifications, Causes, Clinical manifestations, and treatment methods used in Psychiatry.	

	Cardiac Conditions a) Basic anatomy of heart, Coronary circulation, and development of heart b) Normal cardiac contraction and relaxation: mechanism and diagnosis. c) Physiology, clinical presentation in ischemic heart disease. d) Physiology, clinical presentation in Congestive heart failure. e) Physiology, clinical presentation in Peripheral Vascular disease & Deep vein thrombosis.	

	Unit III (Pediatrics)	12 H
3	Describe growth and development of child from birth to 12 year including physical, social, adaptive development.	
	List the maternal and neonatal factors contributing to high-risk pregnancy. The neonate: inherited diseases.	
	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.	
	Unit IV	20 H
4	Cerebral palsy: Define and briefly outline etiology of prenatal, perinatal, and postnatal causes, briefly mention pathogenesis, types of cerebral palsy (Classification), findings on examination, general examination of C.N.S, Musculoskeletal and respiratory system.	
	Briefly outline associated defects: Mental retardation, microcephaly, blindness, hearing and speech impairment, squint, and convulsions.	
	Prevention: Appropriate management of high-risk pregnancies, prevention of neonatal and postnatal infections, metabolic problems.	
	Muscular Dystrophy: Outline various forms, modes of inheritance and clinical manifestation physical finding in relation to disabilities progression of various forms and prognosis. Describe treatment goals in forms which are and are not fatal.	
	Unit V	20 H
5	Spina bifida, meningomyelocele: Outline development, clinical features lower limbs, bladder and bowel control, complications UTI & hydrocephalus.	
	Still's disease: Classification, pathology in brief, physical findings, course & prognosis. Outline treatment, prevention, and correction of	

	deformity.	
	Acute C.N.S. infections: Classify (Bacterial and viral) and outline the acute illness & Physiology, clinical presentation.	
	Normal diet of new-born and child: List dietary calorie, fat, protein, mineral and vitamin requirement in a normal child and in a child with malnutrition,	
	Lung infections: Physiology, clinical presentation in relation to bronchiectasis, lung abscess and bronchial asthma, cystic fibrosis ARDS	
	Intensive pediatric care & Physiology, clinical presentation.	

SUBJECT: MEDICINE AND PEDIATRICS Practical SUBJECT CODE: MEP391

CREDITS: 2

S. No.	Topics	Hours
1.	Clinical Examination techniques (general and systemic examination)	4H
2.	Chest examination	6H
3.	Geriatric Assessment	6H
4.	Paediatric Assessment (Milestone assessment and neurological reflexes)	8H
5.	Observation and case discussion of emergency and ICU based learning.	8H

Suggested Reading:

Textbooks:

1. Clinical Medicine: P. J. Mehta
2. Golwalla- Medicine for students
3. API – Text book of Medicine- 5 th edition
4. Essentials of Paediatrics- by O. P. Ghai – Inter Print publications

Reference:

1. Principles & Practice of Medicine – 16thedn – by Davidson

SUBJECT: NEUROLOGY & NEUROSURGERY
SUBJECT CODE: NNS301
CREDITS: 4

Course Objectives:

The course enables the students to understand etiology, pathophysiology, signs and symptoms and management of the various neurological and neurosurgical conditions.

Course Outcomes (CO):

After taking this course a student will:

CO1: Understand the basic neurological conditions which commonly cause disability and their management.

CO2: Know the aetiology, Classification, Pathology, Clinical Features, Relevant Investigations, Complications, Surgical & Non-Surgical Management of various Neurological Conditions.

Course Contents:

S. No.	Topics	Hours
	Neurology	
1	**Unit I: Neuroanatomy and Neurophysiology**	10 H
	General principles of neuroanatomy and neurophysiology.	
2	**Unit II : Infections and Movement Disorders**	25H
	Acute infection of CNS- Bacterial meningitis and its neurological sequelae.	
	TB infection of CNS	
	Viral and post viral neurological conditions	
	Parkinson's Disease and movement disorders: basal ganglia disorders, athetosis, dystonia, Huntington's disease	
	Cerebral palsy	
	Epilepsy	
3	**Unit III: Vascular and Traumatic Disorders**	20H
	Advances in cerebrovascular accident (stroke) classification and pathophysiology. Modern assessment techniques for stroke (neuroimaging and biomarkers) Evidence based stroke management (acute care, rehabilitation and secondary prevention)	
	Traumatic brain injury	
	Traumatic spinal cord injury	
4	**Unit IV: Neurodegenerative and Neuromuscular Disorders**	
	Multiple Sclerosis	
	Motor neuron diseases including ALS (amyotrophic lateral sclerosis)	
	Muscular Dystrophies	
	Cervical and lumbar disc lesions	

	Syringomyelia	
	Gullian Barre Syndrome	
	Acute Disseminated Encephalomyelitis	
5	**Unit V: Peripheral Nerve and Spinal Disorders**	
	Myasthenia Gravis	
	Diseases of Peripheral Nerves and Cranial Nerves	
	Diabetic Polyneuropathy	
	Cervical and Lumbar Spondylosis and Disc Prolapsed	
Neurosurgery		
6	**Unit VI**	25H
	Intracranial and Spinal Tumors	
	Common surgeries of Cranium and Brain	
	Common surgeries of Vertebral Column and Spinal Cord	
	Common surgeries of Peripheral Nerves	
	Surgical Interventions in Traumatic Head Injuries	
	Shunts	
	SOL Resection	
	Surgical Management of Spasticity	

SUBJECT: NEUROLOGY & NEUROSURGERY Practical SUBJECT CODE: NNS391

CREDITS: 2

S. No.	Topics	Hours
1.	Mapping of Human Brain	4H
2.	Cranial Nerve Dysfunction Screening	6H
3.	Stroke Assessment using NIHSS	6H
4.	Reflex Testing and Tone Assessment in Neurological Patients	4H
5.	Gait Observation and Analysis (both quantitative and qualitative) in Neurological Disorders	8H
6.	Sensory Assessment	5H
7.	Dermatomal and Myotomal Assessment	2H
8.	Video-Based Discussion for Neurosurgical Cases	6H

Suggested Reading:

Textbooks:

1. Brain Aids to the Examination of the Peripheral Nervous System, 4th Revised ed, London, Saunders
2. Geraint Fuller, Neurological Examination Made Easy
3. Illustrated Neurology & Neurosurgery: Lindsay.
4. Textbook of Neurology- Victor Adams
5. Roger Barker, S Barasi, Neuroscience briefly
6. Michael Donaghy, Brain's Diseases of the Nervous System

References:

1. Kumar. Neurosurgery review.1st ed, New Delhi, Jaypee Brothers Medical Publishers(P) Ltd.2009
2. Ahuja. A short textbook of psychiatry, 6 ed, New Delhi, Jaypee Brothers Medical Publishers(P) Ltd.2009

SUBJECT: SURGERY INCLUDING OBSTETRICS & GYNAECOLOGY

SUBJECT CODE: SOG301
CREDITS: 4

Course Objectives:

The course enables the students to understand the causes of disorders of different systems of body and enable them to understand the principles behind the management of disorders related to above said areas.

Course Outcomes (CO):

After taking this course a student will:

CO1: Demonstrate a general understanding of the diseases that therapists would encounter in their practice. Understand the etiology and pathology, the patient's symptoms, and the resultant functional disability. Understand the limitations imposed by the diseases on any therapy.

CO2: Elaborate broad outline of goals of pharmacological and surgical therapy imparted in those diseases in which physical therapy will be an important component of overall management.

CO3: Understand the anatomy, physiology and various conditions in Obstetrics and Gynecological conditions relevant to Physiotherapy.

CO4: Assess and provide physiotherapeutic techniques in Obstetrics and Gynecological conditions for relief of pain, relaxation, conditioning, and posture.

Course Contents:

S. No.	Topics	Hours
	Unit I (General Surgery)	18 H
1	Principles of Preoperative management of surgical patients.	
	Principles of postoperative management of surgical patients	
	Common pre complications	
	Common post-operative complications	
	Shock – Definition, types, clinical features, pathology, and management	
2	**Unit II**	15H
	Hemorrhage- common sites, complication, clinical features, and management.	
	Management of hemorrhage	
	Surgical intensive care	
	Description of events frequently accompanying in general anesthesia, and	
	Blood transfusion	
	Physiological response of the body to surgery	
3	**Unit III**	22H
	Abdominal surgery: Incisions, complications, and management of various abdominal surgeries	
	Wounds and wound infections, Sinuses, and ulcers	
	Burns: Degrees of burns and, management and reconstructive surgery following burns and complications of Burns	
4	**Unit IV (Cardiothoracic Surgery)** Incisions for cardiothoracic surgery – General pre- and post-operative management of cardio-thoracic surgery – Various surgical procedures for various chest and cardiac conditions/diseases	15H
	Unit V (OBS and GYN)	15H

	Anatomy of pelvic organs mechanism & physiology of pelvic floor sphincter muscles.	
5	Pregnancy – stage of pregnancy – Labour – stage of Labour – delivery	
	Menopause effects in emotions and musculo-skeletal system & common gynecological disorders	
	Unit VI (Plastic Surgery) Principles of cineplasty, tendon transplant, cosmetic surgery, types of grafts, surgery of hand with emphasis on management of traumatic and leprosy	15H

Suggested Readings:

1. T.B. of surgery by S. Das
2. Clinical & Operative surgery by S. Das
3. Bailey & Love's short practice of Surgery.
4. . Nicki R. Colledge, Brian R. Walker, Stuart H. Ralston. Davidson's Principles and Practice of Medicine. 21st ed Churchill Livingstone, 2010
5. Anthony S. Fauci, Eugene Braunwald, Dennis L. Kasper, Stephen L. Hauser, Dan L. Longo, J. Larry Jameson, Joseph Loscalzo. Harrison's Principles of Internal Medicine, 17th ed. McGraw Hill Professional,2008
6. Michael Swash, Michael Glynn. Hutchinson's Clinical Methods. An Integrated Approach to Clinical Practice. Saunders,2007.
7. Textbook of Gynecology – by Dutta – New Central Book Agency
8. Textbook of Obstetrics – by Dutta – New Central Book Agency

SUBJECT: SURGERY INCLUDING OBSTETRICS & GYNAECOLOGY Practical SUBJECT CODE: SOG391

CREDITS: 2

S. No.	Topics	Hours
1.	Evaluation / presentation and recording of one case each in burns, wound & ulcer, post thoracic surgery, post abdominal surgery	4H
2.	ICU care and management	6H
3.	Demonstration of Pelvic floor muscle strengthening exercises	6H
4.	Management of Urinary and Faecal Incontinence	8H
5.	Observation and case discussion of one abdominal & one thoracic surgery & one surgery of skin graft / flap.	8H

SUBJECT: SOCIOLOGY AND PSYCHOLOGY
SUBJECT CODE: SOP301

CREDITS: 4

Course Objectives:

The course involves a description of some psychological parameters especially as they relate to physiotherapeutic practice and it will introduce students to the basic sociological concepts, principles and social process, social institutions and the various social factors affecting the family in rural and urban communities will be studied.

Course Outcomes (CO):

After taking this course a student will:

CO1: Apply some general psychological principles when dealing with patients.

CO2: Demonstrate and understanding of the role of sociocultural factors on health and disease and related to physiotherapy.

CO3: Recognize and help with the psychological factors involved in disability, pain, disfigurement, unconscious patients, chronic illness, death, bereavement, and medical surgical patients/conditions.

CO4: Understand the elementary principles of behavior for applying in the therapeutic environment.

CO5: Understand the concept of stress and its relationship to health, sickness, and one's profession.

Course Contents:

S. No.	Topics	Hours
	Sociology	
1	**Introduction**: Meaning- Definition and scope of sociology It's related to Anthropology, Psychology, Social Psychology. Methods of Sociological investigations- Case study, social survey, questionnaire, interview, and opinion poll methods. Importance of its study with special reference to Health Care Professionals	5H
2	**Social Factors in Health and disease situations:** Meaning of social factors Role of social factors in health and illness. Present Rehabilitation Services	3H
3	**Socialization:** Meaning and nature of socialization Primary, Secondary and Anticipatory socialization Agencies of socialization Social Groups: Concepts of social groups influence of formal and informal groups on health and sickness. The role of primary groups and secondary groups in the hospital and rehabilitation setup	5H
4	**Family:** The family, meaning and definitions. Functions of types of family Changing family patterns. Influence of family on the individual's health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy.	5H
5	**Community:** Rural community: Meaning and features –Health hazards of rurality, health hazards to tribal community. Urban community: Meaning and features- Health hazards of urbanities	4H
6	**Culture and Health:** Concept of Health Concept of Culture and Health Culture and Health Disorders	5H

7	**Social change:** Meaning of social changes. Factors of social changes. Human adaptation and social change. Social change and stress. Social change and deviance. Social change and health programme. The role of social planning in the improvement of health and rehabilitation. Social Problems of disabled. 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, geriatric problems, Problems of underprivileged	11 H
8	**Social Security:** Social security and social legislation in relation to the disabled **Social worker**: Meaning of Social Work, The role of a Medical Social Worker	3H
	Psychology	
1	**Definition of Psychology**: Science of mind, consciousness, and behavior Scope and branches of Psychology	5H
2	**Methods of Introspection, observation, and experimentation**	3H
3	**Hereditary and Environment** i. Relative importance of heredity and environment ii. Physical characteristics intelligence and personality. iii. Nature vs. nurture controversy	6H
4	**Learning**: Types of Learning- Trial and error, Classical Learning, Instrumental learning, Insight for Learning	6H
5	**Memory**: Steps of memory, Measurement of memory, Causes of forgetting, Concept of STM and LTM	6H
6	**Perceptual Process**: Nature of perceptual process, Structural and functional factors in perception, Illusion and Hallucination	6H

7	**Emotion**: Emotion and feeling, Physiological changes, Theories of emotion (James-Lange and Eonnon-Bird)	6H
8	**Motivation**: Motive: need and Drive, Types of motive: Physiological, Psychological and Social	2H
9	**Intelligence**: Definition: theory and assessment	5H
10	**Personality**: Definition: Types and measurements	5H

11	**Child Psychology** 1. Concept of child Psychology: Meaning: nature and subject matter of child Psychology, Practical importance of studying child Psychology for rehabilitation professionals 2. Methods of studying child development: Baby Biography, Case History, Behavior rating **Applied Psychology** Rehabilitation Psychology: Interpersonal Relationships, Family & 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.	7H

Suggestive Readings:

Textbooks:

1. Megre – Sociology Drydon Press Illinois.
2. Social Problems in India by Ram Ahuja
3. Psychology for Physiotherapists- Jaypee
4. Psychology for Physiotherapists- S K Mangal

References:

1. Sachdeva, & Bhushan – An Iintroduction to Sociology – Allahabad, Kitab Mahal Ltd.
2. Madan – India Social Problem Vol. 1. – Madaras Allied Publication – 1973
3. Kupuswamy-Social Changes in India – Vikas Delhi
4. Bharucha Erach-The Biodiversity of India, Mapin publishers
5. Cunningham WP-Environmental Encyclopedia, Jaico paul house

SUBJECT: RESEARCH METHODOLOGY & BIOSTATISTICS
SUBJECT CODE: RMB301
CREDITS: 2

Course Objectives:

The course involves a description of some psychological parameters especially as they relate to physiotherapeutic practice and it will introduce students to the basic sociological concepts, principles and social process, social institutions and the various social factors affecting the family in rural and urban communities will be studied.

Course Outcomes (CO):

After taking this course a student will:

CO1: Enumerate the steps in Physiotherapy research process

CO2: Describe the importance & use of biostatistics for research work.

CO3: Describe the PICO format, methods of reviewing literature, formulating hypothesis, collecting data, writing research proposal and research ethics

CO4: Describe study designs, define sampling techniques and discuss the concept of probability and probability distribution, application of inferential statistics and descriptive analysis

CO5: Demonstrate skill of preparing a research proposal, data tabulation, graphical representation of data and research report

S. No.	Topics	Hours
1	**Unit I – Research Methodology** 1. Introduction to Research methodology: Meaning of research, objectives of research, Motivation in research, Types of research & research approaches, Research methods vs. methodology, Criteria for good research, ethics of research 2. Research problem: Statement of research problem., Statement of purpose and objectives of research problem, Necessity of defining the problem , hypothesis , limitations , delimitations significance of the study 3. Research design: Meaning of research design, Need for research design, Features for good design, Different research designs, Basic principles of research design 4. Sampling: Sampling fundamentals, need for sampling & some fundamental definitions, important sampling distributions, Criteria for selecting sampling procedure, Implications for sample design, steps in sampling design, characteristics of good sample design, Different types of sample design 5. Measurement & scaling techniques: Measurement in research-Measurement scales, sources of error in measurement, reliability, validity , sensitivity and specificity of a measurement tool Technique of developing measurement tools, Meaning of scaling, its classification. Important scaling techniques. 6. Methods of data collection: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules. Format of scientific documents. (Structure of protocols, formats reporting in scientific journals, systematic reviews and meta-analysis). 7. Computer technology: Introduction to Computers, computer application in research, Introduction to data analysis software's	20H

	Unit II- Biostatistics	
2	**1.** Introduction: Meaning, definition, characteristics of statistics., Importance of the study of statistics, Branches of statistics, Statistics and health science including physiotherapy, Parameters and Estimates, Descriptive and inferential statistics, Variables and their types, Measurement scales. **2.** Tabulation of Data: Basic principles of tabulation and graphical representation, Types of diagrams – histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, and Normal probability curve. Pie chart **3.** Measure of Central Tendency: Need for measures of central Tendency, Definition and calculation of mean – ungrouped and grouped, Meaning, interpretation and calculation of median ungrouped and grouped., Meaning and calculation of mode, Comparison of the mean, median and mode, Guidelines for the use of various measures of central tendency. **4.** Probability and Standard Distributions: Meaning of probability of standard distribution, the binominal distribution, the normal distribution, Divergence from normality – skew ness, kurtosis. **5.** Sampling techniques: sample size, calculation of sample size for survey, and experimental research designs, Sampling variation and tests of significance. Type I and type II errors, Power. **6.** Testing of hypothesis: Basic concepts concerning testing of hypothesis, Procedure of hypothesis testing, measuring the power of hypothesis test, Tests of hypothesis, parametric and non-parametric tests for difference , correlation and association	20H
	Unit III- Evidence Based Practice	

3	1. **Introduction to Evidence Based practice** Definition, background, importance, model of Evidence Based Physiotherapy, role of evidence based practitioner 2. **Exploring different terminologies** Validity, reliability, Randomized Control Trial, Systemic Review, Meta-Analysis, Case Study, Diagnostic research study, Prognostic Research study, Intervention research study,	5H

Recommended Readings:

1. Foundations of Clinical Research: Applications to Evidence Based Practice – Leslie G. Portney
2. Research Methodology: Methods and Techniques- C.R. Kothari
3. Research Methods for Clinical Therapists- Carolyn Hicks

DEPARTMENT OF PHYSIOTHERAPY
UNIVERSITY OF ENGINEERING AND MANAGEMENT, JAIPUR

SUBJECT: PT in NEUROLOGY & NEUROSURGERY SUBJECT

CODE: PTN401

CREDITS: 4

MARKS DISTRIBUTION: Maximum: 100 Marks (Internal: 30 MARKS; External: 70 Marks) Course

Objectives:

The course deals with physiotherapeutic management of neurological and neurosurgical conditions. The subject serves to integrate the knowledge gained by the students in neurology and neurosurgery with skills to apply these in clinical situations of dysfunction and neurological pathology. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify disabilities due to neurological dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore neurological function.

Course Outcomes (CO):

After taking this course a student will:

CO1: Acquire knowledge of normal neurodevelopment with specific reference to locomotion.

CO2: Assess, identify, and analyze neuro motor and psychosomatic dysfunction in terms of alteration in the muscle tone, power, coordination, involuntary movements, sensations, perceptions etc.

CO3: Correlate the assessment findings with provisional diagnosis and investigations such as EMG/NCS and arrive at Physical and functional diagnosis with clinical reasoning in various neuromuscular disorders.

CO4: Plan, prescribe and execute short term and long-term treatment with special reference to relief of neuropathic and psychosomatic pain and use of various physiotherapeutic techniques/ modalities, including ergonomic advice and parent education in neuro pediatric cases.

CO5: Prescribe appropriate orthoses/splints and fabricate temporary protective and functional splints.

Course Contents:

S. No.	Topics	Hours	CO
	Review of Neuro Anatomy and Neurophysiology		
1	Review the basic anatomy of the brain and spinal cord including Blood supply of the brain and spinal cord, anatomy of the visual pathway, connections of the cerebellum and extra-pyramidal system	15 H	
	Relationship of the spinal cord segments, long tracts of the spinal cord, the brachial and lumbar plexuses, and cranial nerves.		
	Neurological Assessment and Diagnostic Techniques		
	Physiotherapy evaluation of neurological patients: Assessment of higher functions, Sensory assessment (superficial, deep and combined cortical sensations), Cranial nerve assessment, Tonal assessment, Reflex examination, Assessment of various neurological gaits, Functional evaluation, Pediatric neurological assessment		
	Diagnostic Procedures: Electrodiagnostic procedures (EMG, NCV) and their interpretations. Investigative procedures for neurological disorders (CT, MRI, PET scans). Evoked Potentials (VEP,SSEP,BAER)		
2	**Unit II: PT in Congenital and Developmental Neurological Disorders**	10 H	
	Hydrocephalus, Spina Bifida, Craniovertebral junction anomalies, Arnold Chiari malformation, Dandy Walker Syndrome, Cerebral Palsy, Down Syndrome		
3	**Unit III: PT in Vascular, Traumatic and Demyelinating Neurological Disorders**	15 H	
	Cerebrovascular accidents (Stroke), Traumatic Brain Injury, Spinal Cord Injuries		
	Transverse myelitis, Syringomyelia, Meningitis and encephalitis, Tuberculosis infection of central nervous system, Poliomyelitis, Multiple Sclerosis, Acute disseminated encephalomyelitis, Brain abscess, Tabes Dorsalis Acute disseminated encephalomyelitis		
4	**Unit IV: PT in Neurodegenerative, Movement and Vestibular Disorders**	10 H	
	Parkinson's Disease, Myopathies, Motor neuron disease, Dementia (Alzheimer's,		

	Lewy Body), Motor neuron disease, Extra pyramidal tract lesions, Ataxia, Myasthenia Gravis, Epilepsy, Vestibular System Dysfunction, Disc Prolapse, Herniation of Brain,		
5	**Unit V: PT in Peripheral Nerve, Muscular and Neurosurgical Conditions**	**15 H**	
	Peripheral Nerve Injuries, Polyneuropathy, Diabetic Neuropathy, Bell's Palsy, facial palsy, and Trigeminal Neuralgia, Gullian Barre Syndrome, Muscular Dystrophy, Intracranial and spinal tumors, Pre- and Post-operative management of neurological conditions, Neurosurgical Intensive Care		
6	**Unit VI: Physiotherapy Approaches and Emerging Trends**	**15 H**	
	Specialized Physiotherapy Approaches: Bobath Approach**,** Brunnstrom Approach**,** Motor Relearning Programme**,** Rood's Approach**,** Proprioceptive Neuromuscular Facilitation (PNF)**,** Sensory Integration		
	Emerging Trends and Research in Neurological Physiotherapy Recent advancements in neurorehabilitation, Evidence based practice in neurophysiotherapy, Neuroplasticity and its application in rehabilitation, Robotics, Virtual Reality, and AI in neurorehabilitation		

SUBJECT: PT in NEUROLOGY & NEUROSURGERY PRACTICAL SUBJECT CODE: PTN491

CREDITS: 2

S. No.	Practical	Hours
1	Evaluation of higher functions, sensory testing, cranial nerve assessment, tone, reflexes, and gait analysis using real-case scenarios.	5H
2	Implementing of standardized neurological scales.	5H
3	Various techniques of Physiotherapy of the above-mentioned conditions/diseases should be demonstrated and practiced by the students	
4	Demonstration on EMG, NCV and their interpretation.	5H
5	Demonstration of Brunnstrom's, Bobath, and Proprioceptive Neuromuscular Facilitation (PNF), Constraint-Induced Movement Therapy (CIMT), MRP, Sensory Integration and Mirror Therapy.	15H
6	Practical analysis of neurological gaits and their gait training.	8H
7	Demonstration of LSVT BIG exercises for Parkinson's disease.	5H
8	Demonstration of maneuvers for BPPV.	4H
9	Development and Implementation of AI, VR and robotic based devices.	10H

Essential Readings:

1. Tidy's physiotherapy.
2. Cash's Textbook of Neurology for Physiotherapists
3. Neurological Rehabilitation by D Umphred
4. Physical Rehabilitation Assessment and Treatment – O'Sullivan Schmitz
5. Elements of Pediatric Physiotherapy-Eckersley

SUBJECT: PT in MEDICAL CONDITIONS AND PEDIATRICS SUBJECT CODE: PTM401

CREDITS: 4

Course Objectives:

The course provides knowledge in assessing and planning physiotherapy interventions for various Medical and Pediatric conditions. The student must be able to reassess the patient as necessary, to monitor the patient regarding treatment, to monitor the patient's vital signs, and to provide appropriate interventions to the patient.

Course Outcomes (CO):

After taking this course a student will:

CO1: Identify, discuss and analyze cardiovascular and pulmonary dysfunction based on pathophysiological principles and arrive at the appropriate physical and functional diagnosis. CO2: Acquire knowledge of rationale of basic investigative approaches in the medical system and surgical intervention regimes related to cardiovascular and pulmonary impairment.

CO3: Execute the effective physiotherapeutic measures (with appropriate clinical reasoning) with special emphasis to breathing retraining, nebulization, humidification, bronchial hygiene, general mobilization, and exercise conditioning in general medical and surgical conditions.

CO4: Acquire knowledge of the overview of patients care at the intensive care area, artificial ventilation, suctioning, positioning for bronchial hygiene and continuous monitoring of the patient at the intensive care area.

CO5: Acquire the skill of evaluation and interpretation of functional capacity using simple exercise tolerance tests, symptom limited tests.

CO6: Select strategies for cure, care, and prevention to adopt restorative and rehabilitative measures for maximum possible functional independence of a patient at home, workplace and in community.

CO7: Acquire the skill of basic cardiopulmonary resuscitation.

CO8: Acquire the knowledge of evaluation and physiotherapy treatment for obstetrics and gynecological conditions.

CO9: Acquire the knowledge of various conditions where physiotherapy plays a vital role in the

Rehabilitation (psychiatry, dermatology, and ENT conditions)

CO10: Assess the various degrees of burns, plan and implement physiotherapy techniques for the rehabilitation of a burn and wound patient.

Course Contents

S. No.	Topics	Hours
1	**Unit I (General Medicine)**	20 H
	Brief review of the following medical condition and various modalities of Physiotherapy, aims, mean and techniques of physiotherapy should be Taught.	
	Edema- classification and management, Skin Conditions - Acne, psoriasis, alopecia, leucoderma, leprosy, STDs, Deficiency disease- Rickets, Vitamin Deficiency Syndrome, osteoporosis, osteomalacia, Obesity, Non-articular rheumatism, Connective tissue disorders	
	Unit II (Respiratory)	20 H
	Review of mechanism of normal respiration, Chest examination including auscultation, Pulmonary function testing Physiotherapy management of COPD, asthma, lung abscess, bronchiectasis, emphysema etc, Pleurisy, empyma, pneumonia etc, Bacterial diseases, Paralysis of diaphragm and vocal	
	cords, Chest deformities, Segmentectomy, Wedge Resection, Pleurodesis, Decortication	
	Unit III (Cardiovascular)	
	Congestive Heart Failure, Myocardial Infraction, CTVS, CABG, Peripheral vascular diseases, Gangrene, Deep Vein Thrombosis (DVT), coronary artery disease (CAD), Myocardial Infarction (MI), Hypertension, Valvular Heart Disease, Cardiomyopathies, Peripheral Arterial Disease (PAD) (DVT), Post-cardiac surgery (valve replacement, etc.) PT management of the above given conditions.	
	Unit IV Pediatrics and Geriatrics	

	Pediatrics : Common congenital and acquired musculoskeletal, neurological, hereditary, metabolic disorders, **Geriatrics**: Identification, assessment, and management of geriatric musculoskeletal, cardio-pulmonary, neurological, somatosensory; injuries and accidents Specifically, to aged	
	Unit V (Psychiatric disorders)	
	Senile dementia, Psychosis, Psychoneurosis	

SUBJECT: PT in MEDICAL CONDITIONS AND PEDIATRICS PRACTICAL

SUBJECT CODE: PTM491

CREDITS: 2

S. No.	Practical Topic	Hours
1	Auscultation of lungs	4
2	Pulmonary function testing (PFT)	4
3	Breathing exercises	3
4	Cardiovascular assessment techniques	4
5	Edema measurement and management	3
6	Physiotherapy techniques for osteoporosis	4
7	Pediatric milestone assessment	3
8	Dementia cognitive evaluation	3
9	Fall risk assessment in geriatrics	4
10	Chest physiotherapy techniques	4

Essential Readings:

1. Tidy's physiotherapy.
2. Cash's Textbook of Chest, Heart, Vascular Disorders for Physiotherapists.
3. The Brompton Guide to chest physiotherapy DU Gasket [Completed]
4. Physical Rehabilitation Assessment and Treament – O'Sullivan Schmitz
5. Elements in Pediatric Physiotherapy – Pamela M Eckersley
6. Essentials of Cardiopulmonary Physical Therapy by Hillegass and Sadowsky
7. Cardiao pulmonary Symptoms in physical Therapy practice Cohen and Michel
8. Chest Physiotherapy in Intensive Care Unit by Mackenzi
9. Cash's Textbook of General Medicine and Surgical conditions for Physiotherapists.
10. Physiotherapy in Psychiatry
11. Physical Therapy for the Cancer patient by M.C Garvey
12. Physiotherapy in Obstetrics and Gynecology by Polden

SUBJECT: PT in SURGICAL CONDITIONS
SUBJECT CODE: PTS401

CREDITS: 4

Course Objectives:

The course provides knowledge in assessing and planning physiotherapy interventions for various General, Medical and Surgical conditions. The student must be able to reassess the patient as necessary, to monitor the patient regarding treatment, to monitor the patient's vital signs, and to provide appropriate interventions to the patient.

Course Outcomes (CO):

After taking this course a student will:

CO1: Identify, discuss, and analyze cardiovascular and pulmonary dysfunction based on pathophysiological principles and arrive at the appropriate physical and functional diagnosis.

CO2: Acquire knowledge of rationale of basic investigative approaches in the medical system and surgical intervention regimes related to cardiovascular and pulmonary impairment.

CO3: Execute the effective physiotherapeutic measures (with appropriate clinical reasoning) with special emphasis to breathing retraining, nebulization, humidification, bronchial hygiene, general mobilization, and exercise conditioning in general medical and surgical conditions.

CO4: Acquire knowledge of the overview of patients care at the intensive care area, artificial ventilation, suctioning, positioning for bronchial hygiene and continuous monitoring of the patient at the intensive care area.

CO5: Acquire the skill of evaluation and interpretation of functional capacity using simple exercise tolerance tests, symptom limited tests.

CO6: Select strategies for cure, care, and prevention to adopt restorative and rehabilitative measures for maximum possible functional independence of a patient at home, workplace and in community. CO7: Acquire the skill of basic cardiopulmonary resuscitation.

CO8: Acquire the knowledge of evaluation and physiotherapy treatment for obstetrics and gynecological conditions.

CO9: Acquire the knowledge of various conditions where physiotherapy plays a vital role in the rehabilitation (psychiatry, dermatology, and ENT conditions)

CO10: Assess the various degrees of burns, plan and implement physiotherapy techniques for the rehabilitation of a burn and wound patient.

Course Contents

S. No.	Topics	Hours
1.	Brief review of the following surgical conditions and various physiotherapeutic modalities, aims, means and techniques of physiotherapy should be taught	10 H
2.	Postural drainage & respiratory physiotherapy in CVTS including principles of cardiac rehabilitation, Physiotherapy in patients on ventilators	10 H
3.	Pre- and post-operative physiotherapy management of the following conditions. a. Thoracotomy b. Lobectomy c. Thoracoplasty d. Pneumonectomy e. Decortication f. Herniorrhaphy g. Nephrectomy h. Radical Mastectomy i. Abdominal Surgeries	15 H
5.	Orientation about atelectasis, pneumothorax & another post-operative Complications	10 H
6.	Pre- and post-operative physiotherapy management of pediatrics and adult cardiac surgery including vascular surgery	10 H
7.	Burn & its classification Physiotherapy management, Pre and Postoperative Physiotherapy of skin grafting, PT in Wound management	2 H
8.	Physiotherapy of cases after Reconstructive surgery of hand	5 H

9.	Physiotherapy in obstetrics, Pregnancy (pre and post-natal), and women health, Physiotherapy in PID, stress incontinence, prolapse uterus	5 H

SUBJECT: PT in SURGICAL CONDITIONS PRACTICAL

SUBJECT CODE: PTS491

CREDITS: 2

S. No.	Practical	Hours
1	Practical session on Active Cycle of Breathing Techniques (ACBT) and Use of incentive spirometry.	5H
2	Practical session on physiotherapy techniques for patients on ventilators (Positioning, ROM, communication).	5H
3	Practical session on incision splinting, deep breathing, and coughing Techniques post-thoracotomy/lobectomy/pneumonectomy.	6H
4	Practical session on positioning and early mobilization strategies post-Abdominal surgery/herniorrhaphy/nephrectomy.	6H
5	Practical analysis of limb volume measurement and upper quadrant Exercises post-radical mastectomy.	4H
6	Demonstration on burn assessment (%TBSA, depth) and anti-deformity positioning/splinting, scar massage techniques and pressure garment application.	8H
7	Practical session on hand assessment and basic splint fabrication post-reconstructive surgery.	4H
8	Practical session on diastasis recti assessment, pelvic floor muscle techniques, antenatal and postnatal exercise prescription and modification.	7H

Essential Readings:

1. Tidy's physiotherapy.
2. Cash’s Textbook of Chest, Heart, Vascular Disorders for Physiotherapists.
3. The Brompton Guide to chest physiotherapy DU Gasket [Completed]
4. Physical Rehabilitation Assessment and Treatment – O’Sullivan Schmitz
5. Elements in Pediatric Physiotherapy – Pamela M Eckersley
6. Essentials of Cardiopulmonary Physical Therapy by Hillegass and Sadowsky
7. Cardiopulmonary Symptoms in physical Therapy practice Cohen and Michel
8. Chest Physiotherapy in Intensive Care Unit by Mackenzi
9. Cash’s Textbook of General Medicine and Surgical conditions for Physiotherapists.
10. Physiotherapy in Psychiatry
11. Physical Therapy for the Cancer patient by M.C Garvey
12. Physiotherapy in Obstetrics and Gynecology by Polden

SUBJECT: PT in ORTHOPAEDIC CONDITIONS

SUBJECT CODE: PTO401

CREDITS: 4

Course Objectives:

The course integrates the knowledge gained by the students in orthopedics and traumatology with skills to apply these in clinical situations of dysfunction and musculoskeletal pathology. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify disabilities due to musculoskeletal dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore musculoskeletal function.

Course Outcomes (CO):

After taking this course a student will:

CO1: Identify, discuss, and analyze musculoskeletal dysfunction in terms of biomechanical, kinesiological and biophysical basis and correlate the same with the provisional diagnosis, routine radiological and electrophysiological investigations and arrive at appropriate physical and functional diagnosis with clinical reasoning.

CO2: Describe as well as acquire the skill of executing short- and long-term physiotherapy treatment by selecting appropriate modes of mobilization/ manipulation, electrotherapy, therapeutic exercise and appropriate ergonomic advice for the relief of pain, restoration / maintenance of function & / or rehabilitation for maximum functional independence in ADLs at home & workplace.

CO3: Understand the nature of sports injuries, able to evaluate and treat sports injuries, understand the role of physiotherapist in training and rehabilitating a sports person.

CO4: Prescribe appropriate walking aids, orthoses, and prosthesis

Course Contents:

S. No.	Topics	Hours
1	**Unit I (Introduction)**	15 H
	PT assessment for orthopedic conditions - SOAP format. Subjective - history taking, informed consent, personal, past, medical and socioeconomic history, chief complaints, history of present illness. Pain assessment- intensity, character, aggravating and relieving factors, site and location. Objective- on observation - body built swelling, muscle atrophy, deformities, posture and gait. On palpation- tenderness-grades, muscle spasm, swelling- methods of swelling assessment, bony prominences, soft tissue texture and integrity, warmth and vasomotor disturbances. On examination ROM – active and passive, resisted isometric tests, limb length-apparent, true and segmental, girth measurement, muscle length testing-tightness, contracture and flexibility, manual muscle testing, peripheral neurological examination-dermatomes, myotomes and reflexes, special tests and functional tests. Prescription of home program. Documentation of case records and follow up.	
	Unit II	
2	Principles of pre-and post-operative PT assessment, goals, precautions and PT management of Orthopaedic surgeries: Arthrodesis, Osteotomy, Arthroplasty-partial and total - Excision arthroplasty, excision arthroplasty with implant, interposition arthroplasty and total replacement; Tendon transplant, soft tissue release- tenotomy, myotomy, lengthening; Arthroscopy, Spinal stabilization, Re-attachment of limbs, External fixators, Synovectomy.	
	UNIT III	

3	Degenerative and inflammatory conditions: Definition, signs and symptoms, clinical features, path physiology, radiological features, deformities, medical, surgical management. PT assessment and management and home program for the following conditions: Osteoarthritis - emphasis mainly on knee, hip and hand, Rheumatoid Arthritis, Ankylosing spondylitis, Gout, Perthes disease, Periarthritis shoulder, Infective conditions: Definition, signs and symptoms, clinical features, pathophysiology, radiological features, medical, surgical management. PT assessment and management for following conditions- Osteomyelitis: acute and chronic, Septic arthritis, pyogenic arthritis, TB spine and major joints - knee and hip.	
4	**UNIT IV Conservative and/peri-operative PT management in**	
	Classification – types of displacements methods of immobilization, Healing of fractures and factors influencing union, non-union, delayed union etc. Specific fracture of U/L & L/L Bones and their complete physiotherapeutic management. Traumatic conditions of upper limb shoulder arm elbow forearm wrist and hand upper limb fractures and dislocations. sprains Hand Injuries: Flexor tendon, Extensor tendon, Compartment Syndrome, Reflex sympathetic dystrophy, Non traumatic conditions of upper limb conservative and post-operative PT management of Shoulder instabilities, TOS, RSD, Impingement syndrome - AC joint injuries - Rotator cuff tears- Subacromial decompression Carpal tunnel syndrome deformities, Traumatic conditions of lower limb: pelvis, hip knee ankle and foot fractures and dislocations, lower limb hip knee ankle and foot Tendonitis and bursitis, Plica syndrome, patellar dysfunction and Hoffa's syndrome Deformities of lower limb: CTEV, CDH, pes planus, pes cavus, coxa vara, genu varum, valgum and recurvatum,	
5	Pre and peri operative PT management following upper limb surgeries: Total shoulder replacement Hemi replacement Repair of ruptured extensor tendons. Total wrist arthroplasty Flexor and extensor tendon lacerations Excision of radial head -. Total elbow arthroplasty, lower limb surgeries - hemi and total hip replacement -. - Lateral retinacular release, chondroplasty ACL and PCL reconstruction surgeries Management. Realignment of extensor mechanism, Meniscectomy and meniscal repair TKR Patellectomy Ligamentous tears	85 H

	UNIT V	
6	Amputations of upper limb Definition, levels, indications, types, PT assessment, aims, management pre and post operatively. PT management with emphasis on stump care and bandaging. Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management, Physiotherapy in relation to amputation, Amputations of lower limb Definition, levels, indications, types, PT assessment, aims, management pre and post operatively. PT management with emphasis on stump care and bandaging. Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management	
	Conservative and/peri-operative PT management in	
7	Traumatic conditions of spine: SPINAL FRACTURES cervical thoracic lumber Spinal CORD INJURY Intervertebral disc prolapsed (PIVD) sprain contusion, Non traumatic condition of spine: Cervical and lumbar spinal disorders: spondylosis, spondylolisthesis, Stenosis Cervical spondylosis, Lumbar spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacroiliac joint dysfunction, Sacralisation, Lumbarisation, Intervertebral disc prolapse, Coccydynia, Spina bifida occulta, Thoracic Outlet Syndrome TB SPINE, non-specific low back pain Ankylosis spondylitis Scoliosis, kyphosis, Lordosis, sway back, torticollis, Pre and peri operative PT management following spine surgeries, Physiotherapeutic management of fracture of spine with paraplegia and without neuro deficit.	
	Diseases of Bones and Joints – Introduction, Causes, Clinical features, Types, Complications, Investigations and Management - medical and surgical of the following conditions: 1. Infective: Osteomyelitis, TB Spine and other major joints 2. Perthes, Slipped Capital Femoral Epiphysis, Avascular Necrosis 3. Metabolic: Rickets, Osteomalacia	

Suggested Readings:

Textbooks:

1. Orthopedic physical therapy by Donatelli
2. Cash's Textbook of Orthopedics and Rheumatology for Physio Therapists Jaypee bros
3. Manual mobilization of extremity joints by Fredy Kaltenborn, Maitland.
4. Therapeutic Exercise by Kolby and Kisner
5. Therapeutic Exercises by O'Sullivan
6. Taping Techniques – Rose Mac Donald

References:

1. Neural tissue mobilization -Butler.
2. Zulunga et al. Sports Physiotherapy-W.B. Saunders.
3. Brokner and Khan, Clinical sports medicine -McGraw Hill
4. Reed Sports injuries, Assessment and Rehabilitation- W.B. Sounders.
5. Gould: Orthopedic sports physical therapy

SUBJECT: PT in ORTHOPAEDIC CONDITIONS PRACTICAL SUBJECT

CODE: PTO491

CREDITS: 2

S. No.	Practical	Hours
1	Long /short case examination of patients focusing on history taking examination observation, palpation, special tests, investigations, identification of abnormalities in radiograph, diagnosis, functional diagnosis, differential diagnosis & documentation.	10H
2	Planning and execution of management protocol for various conditions of upper limb, lower limb, and spine in various clinical settings with respect to adult and Paediatric conditions	10H
3	Active exercise regimen	5H
4	Passive mobilization procedures	5H
5	Selection of electrotherapeutic modalities	4H
6	Patient education Functional training programme	5H
7	Orthotic and prosthetic checkout and training Ergonomic advice	7H
8	Bedside case presentations and case discussions	10H

Textbooks:

1. Orthopedic physical therapy by Donatelli
2. Cash's Textbook of Orthopedics and Rheumatology for Physio Therapists Jaypee bros
3. Manual mobilization of extremity joints by Fredy Kaltenborn, Maitland.
4. Therapeutic Exercise by Kolby and Kisner
5. Therapeutic Exercises by O'Sullivan
6. Taping Techniques – Rose Mac Donald

References:

1. Neural tissue mobilization -Butler.
2. Zulunga et al. Sports Physiotherapy-W.B. Saunders.
3. Brokner and Khan, Clinical sports medicine -McGraw Hill
4. Reed Sports injuries, Assessment and Rehabilitation- W.B. Sounders.
5. Gould: Orthopedic sports physical therapy

SUBJECT: REHABILITATION SCIENCES IN
Physiotherapy-II SUBJECT
CODE: RSP 401 CREDITS: 4

Course Objectives:

This course introduces the student to education and prevention from various disabilities. The students will be able to learn about clinical rehabilitation protocol.

Course Outcomes (CO):

After taking this course a student will:

CO1: Be able to understand the phase of disability process, explanation of its aims and principles, scope of rehabilitation.

CO2: Be able to understand legislations for rehabilitation services for the disabled and P.W.D. acts & recent amendments.

CO3: Be able to know the contribution of social workers towards rehabilitation.

CO4: Be able to describe the principles of Management at the Medical Intensive Care Unit.CO6: Acquire knowledge in vocational evaluation & goals for disabled, role of vocational counselor. CO5: Be able to describe behavioral problems in the disabled, and its principle of management. CO6: Be able to describe socio-economic rehabilitation: Outline of social implications of disability for the individual and for the community pre-vocational evaluation & role of V.C., GOVT. & NGO.

CO7: Discuss methods and team involvement in pre-vocational evaluation and training.

Course Contents:

S. No.	Topics	Hours
1	**Unit I Prosthesis and Orthotics**	**40 H**
	Definition and Basic Principles,	
	Designing and Construction of Upper & Lower extremity Orthotics & Spinal Orthotics.	
	Prescription and design of footwear & its modification	
	Wheelchairs	
	Ambulatory Aids & Assistive Devices	
	Measurement and P.O.P. cast techniques	
	Low-cost thermo-labile material for construction of orthotic	
2	**Unit II Ethics**	**30 H**
	The implications of and confirmation to the roles of professional conduct	
	Legal responsibility for their actions in the professional context and understanding liability and obligations in case of medico legal action	
	A wider knowledge of ethics relating to current social and medical policy in the provision of health care	
3	**Unit III Functional Outcome Measures**	**20 H**
	Functional Assessment and Functional Independence, scales & its clinical uses. Functional Independent Measure, Sylivan index, PEDI, Gross Motor Function all the scales to be used in physiotherapy	
4	**Unit IV Women's health and Child Care**	**10H**
	Women in India and Social issue having impact on physical Function Legal rights and benefits related to health Immunization and breast-feeding	

Suggested Reading:

1. Textbook of Clinical Rehabilitation- S. Sunder
2. Textbook of community-based rehabilitation S. Nagar
3. Chorin C& M Desai, C Gonsalves, Women & the Law, Vol. I & II Socio - legal Information Centre Mumbai
4. Hand Splinting – Wilson – W. B. Saunders.
5. Atlas of Limb Orthotics and Limb Prosthetics American Academy of Orthopedic Surgeons –Mosby.
6. Krusens Handbook of Physical Medicine and Rehabilitation

Subject: Sports Physiotherapy
Subject Code: SPT401

Credits: 4

Course Objectives: This course integrates the study and application of components of sports medicine, including but not limited to:

- Sports medicine careers
- Prevention of athletic injuries
- Recognition, evaluation, and immediate care of athletic injuries
- Rehabilitation and management skills
- Taping and wrapping techniques
- Emergency procedures
- Nutrition
- Sports psychology
- Therapeutic modalities
- Therapeutic exercise

Course Outcomes (COs): After completing this course, students will be able to:

- **CO1**: Assess and provide physiotherapeutic techniques in sports conditions for pain relief, relaxation, conditioning, and posture.
- **CO2**: Recognize, evaluate, and provide immediate care to athletic injuries and aid in rehabilitation.

S. No.	Topics	Hours
1	**Unit I** Pre-exercise evaluation, Diet and nutrition, Measurement of fitness components and sports skills – a) Measurement of muscular strength and endurance b) Measurement of flexibility c) Determination of exercise endurance	**30 H**
2	**Unit II** Sports Injuries Spine – PIVD, Kissing spine, cervical whiplash injuries, facet joint syndrome, SI joint dysfunction Hip – Muscle strain, piriformis syndrome, ITB syndrome, osteitis pubis Knee – Menisci, cruciate, collateral, osteochondritis, chondromalacia patellae, biceps femoris tendonitis, swimmer's knee, patellofemoral pain syndrome Leg & Ankle – Shin splint, Achilles tendonitis & rupture, TA bursitis, ankle sprain, plantar fasciitis, turf toe syndrome Head & Face – Maxillofacial injuries, helmet compression syndrome	**35 H**
3	**Unit III** Sports Injuries Shoulder – Instability, rotator cuff injury, biceps tendonitis and rupture, pectoralis major rupture, scapular dyskinesis, acromioclavicular joint injuries Elbow – Tennis elbow, golfer's elbow, Wrist and Hand – Carpal tunnel syndrome, gamekeeper's thumb, Principles of injury prevention, Principles of training & rehabilitation in sports injuries, Sports in Special Age Groups -Female athlete – Female athletic triad, Younger athlete (Musculo-skeletal problems, management, children with chronic illness and nutrition), Older athlete- Physiological changes with aging, benefits, risks of exercise in elderly, exercise prescription guidelines for elderly	**35H**

SUBJECT: Sports Physiotherapy Practical

COURSE CODE: SPT491

CREDITS: 2

S. No.	Practical Component	Hours
1	Assessment of muscular strength, endurance, and flexibility using field tests	2
2	On-field evaluation of acute sports injuries (e.g., ankle sprain, shoulder dislocation)	2
3	Manual muscle testing and joint range of motion assessment	2
4	Application of taping and wrapping techniques for injury management	2
5	Postural and biomechanical assessment using standard tools	2
6	Design and implementation of sport-specific rehabilitation protocols	2
7	Use of therapeutic modalities like TENS, ultrasound, cryotherapy	2
8	Functional testing and return-to-sport evaluation	2
9	Exercise prescription for female, pediatric, and elderly athletes	2
10	Documentation and communication of injury reports (SOAP notes)	2

Essential Readings:

1. Taping Techniques – Rose Mac Donald
2. Zuluaga et al. Sports Physiotherapy- W.B. Saunders.
3. Brukner and Khan, Clinical sports medicine McGraw Hill
4. Reed Sports injuries, Assessment and Rehabilitation W.B. Sounders.
5. Gould: Orthopedic sports physical therapy Moshy
6. C Norris Sports injuries Diagnosis and Management
7. Principles of athletic training- William Prentice
8. Rehabilitation techniques in Sports medicine- William Prentice
9. Psychological dymanics of Sports Exercise- Diane L. Gill, Kavon Williams, Human Kinetics
10. Physiology of sport and Exercise. Jack H. Wilmore

External Courses:

1. NPTEL course on Introduction to Exercise Physiology & Sports Performance : https://onlinecourses.nptel.ac.in/noc24_hs86/preview
2. NPTEL course on sports psychology: https://onlinecourses.nptel.ac.in/noc24_hs83/preview

Course Title: Project Work: (PW)

PW 1.0. RESEACH PROJECT-

1. The candidate shall submit a project under the supervision of a Physiotherapy faculty during internship The project may be a case study or of recent technique or literature reviews and etc. to make the student to have research mind and to facilitate for higher studies

2. The interns shall maintain the record of work which is to be verified and certified by the Physiotherapy faculty under whom he/she works. Based on the record of work and project, The Internship completion shall be reported in the form of grades by the HOD/ principle while issuing "Certificate of Satisfactory Completion" of internship following which University shall award the BPT degree

3. All internees will be assessed based on their satisfactory attendance, performance in the postings/and the presentation of the logbook and project. The credits and hours of internship will be mentioned in transcript

4. The internship assessment weightage will be based on following criteria: Domains (% of the total marks)

a) Attendance (10%)

b) Log book (60%)

c) Project (30%) of the internship assessment