



# GALGOTIAS UNIVERSITY

## Syllabus of Bachelor of Physiotherapy

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School of Medical and Allied Sciences

**Name of School:** \_\_\_\_\_

Paramedical and Allied Health Sciences

**Department:** \_\_\_\_\_ (Division of Physiotherapy)

**Year:** \_\_\_\_\_ 2021-25

**Vision:** To be known globally for Physiotherapy education, interdisciplinary research and innovative therapeutic techniques in Rehabilitation.

**Mission:**

M1: To establish state-of-art facilities for physiotherapy education

M2: To collaborate with health care sector for curriculum development to inculcate clinical competencies and entrepreneurship skills

M3. To provide evidence based best practices in physical and rehabilitation therapy through research and innovation

**Program Educational Objectives:**

Graduate shall

- **PEO 1:** take up higher education for career growth and research.
- **PEO 2:** engage in evidence-based treatment and collaborate with other professionals in multidisciplinary team.
- **PEO 3:** provide solutions for improving quality of life with effective physiotherapy rehabilitation.

**Program Outcomes:**

1. Physiotherapy Knowledge: Coursework entitles independent physiotherapy assessment and treatment in any healthcare delivery centers in India by the graduates
2. Problem analysis: Evaluate patients for impairments and functional limitations and able to execute all routine physiotherapeutic procedures as per the evaluation.
3. Design/development of solutions: The graduate will utilize critical inquiry and evidence-based practice to make clinical decisions essential for autonomous practice
4. Leadership skills: the graduate will demonstrate the leadership skills in performing societal and professional upliftment.
5. Professional Identity: Graduates can find employment opportunities in hospitals/nursing homes/sports teams/fitness centers/Community Rehabilitation /Health planning boards/health promotions services in both private and public sectors as well as in independent physiotherapy clinics.
6. Physiotherapy and society: The graduate will function as an active member of professional and community organizations. The graduate will be a service-oriented advocate dedicated to the promotion and improvement of community health.

7. **Basic medical Knowledge:** the graduates will execute their basic medical knowledge in prevention, evaluation, treatment and rehabilitation of patient.
8. **Ethics:** The graduate will be a competent and reflective physiotherapy practitioner who can function safely and effectively while adhering to legal, ethical and professional standards of practice in a multitude of physiotherapy settings for patients and clients across the lifespan and along the continuum of care from wellness and prevention to rehabilitation of dysfunction
9. **Individual or team work:** The coursework is designed to train students to work as independent physiotherapists or in conjunction with a multidisciplinary team to diagnose and treat disorders as per the standard healthcare guidelines.
10. **Communication:** Communicates and educates the individual's family, community, and other professionals about positive health, prevention, wellness, and rehabilitation.
11. **Physiotherapy Patient evaluation & management:** Coursework will skill the graduate's physical/functional diagnosis, treatment planning, management, administration of physiotherapy treatment and for patient support
12. **Life-long Learning:** The graduate will demonstrate lifelong commitment to learning and professional development.

## Semester 1

S.No	Course Code	Name of the Course					Assessment Pattern		
			L	T	P	C	IA	CAT	ETE
1	BPHY1001	Human Anatomy – I	4	0	0	4	10	20	70
2	BPHY1002	Human Physiology -I	4	0	0	4	10	20	70
3	BPHY1003	Biochemistry	3	0	0	3	10	20	70
4	BPHY1004	Sociology	2	0	0	2	10	20	70
5	BPHY1005	Introduction to Healthcare Delivery System in India	2	0	0	2	50		
6	BPHY1008	Community orientation and clinical visit	0	0	2	1	50		
7	BPHP1009	Human Anatomy – I(Lab)	0	0	4	2	30		70
8	BPHY1010	Human Physiology -I(Lab)	0	0	2	1	30		70
9	BPHP1011	Biochemistry (Lab)	0	0	2	1	30		70
10	BPHP1012	Basic computer and information science (Lab)	0	0	4	2	50		
11	BLLUCT1001	Professional Communication-1	1	0	4	3	20	30	70
12	BPHY1013	Introduction to Yoga- Basic theory, science and techniques (Lab)	0	0	2	1	50		
		<b>TOTAL</b>	<b>16</b>	<b>0</b>	<b>20</b>	<b>26</b>			

## Semester II

S. No	Course Code	Name of the Course					Assessment Pattern		
			L	T	P	C	IA	CAT	ETE
1	BPHY2001	Human Anatomy – II	4	0	0	4	10	20	70
2	BPHY2002	Human Physiology – II	4	0	0	4	10	20	70
3	BPHY2003	General and Clinical Psychology	3	0	0	3	10	20	70
4	BPHY2004	Basic principles of Biomechanics	3	0	0	3	10	20	70
5	BPHY2005	Medical terminology and record keeping	2	0	0	2	50		
6	BPHY2006	Human Anatomy – II(Lab)	0	0	6	3	30		70
7	BPHP2007	Human Physiology – II(Lab)	0	0	2	1	30		70
8	BLLUCT1002	Professional Communication - 2	1	0	4	3	20	30	50
9	BPHY2009	Basic principles of Biomechanics (Lab)	0	0	2	1	30		70
10	BPHP2010	Clinical observation	0	0	4	2	30		70
		<b>TOTAL</b>	<b>17</b>	<b>0</b>	<b>18</b>	<b>26</b>			

## Semester III

S.No	Course Code	Name of the Course					Assessment Pattern		
			L	T	P	C	IA	CAT	ETE
1	BPHY3001	Pathology	3	0	0	3	10	20	70
2	BPHY3002	Microbiology	3	0	0	3	10	20	70
3	BPHY3003	Pharmacology	3	0	0	3	10	20	70
4	BPHY3004	Biomechanics and kinesiology	5	0	0	5	10	20	70
5	BPHY3005	Foundation of Exercise Therapy and therapeutic massage	3	0	0	3	10	20	70
6	BPHY3006	Introduction to quality and patient safety (Including Emergency care, BLS, Biomedical waste management, Infection prevention and control, etc.)	1	0	0	1	50		
7	BPHP3007	Pathology (Lab)	0	0	2	1	30		70
8	BPHP3008	Microbiology (Lab)	0	0	2	1	30		70

9	BPHP3009	Biomechanics and kinesiology (Lab)	0	0	4	2	30		70
10	BPHY3010	Foundation of Exercise Therapy and therapeutic massage (Lab)	0	0	4	2	30		70
11	BPHY4005	Bio physics (Lab)	0	0	2	1	30		70
12	BPHY4002	Bio physics	1	0	0	1	10	20	70
13	BPHP3012	Clinical Posting	0	0	4	2	50		
		<b>TOTAL</b>	<b>19</b>	<b>0</b>	<b>18</b>	<b>28</b>			

## Semester IV

S.No	Course Code	Name of the Course					Assessment Pattern		
			L	T	P	C	IA	CAT	ETE
1	BPHY4001	Exercise Therapy	5	0	0	5	10	20	70
2	BPHY4003	Electrotherapy (LMHF & Equipment care)	5	0	0	5	10	20	70
3	BPHP4004	Exercise Therapy (Lab)	0	0	6	3	30		70
4	BPHY4006	Electrotherapy (LMHF & Equipment care) (Lab)	0	0	8	4	30		70
5	BPHY4007	Medical/ Physiotherapy Law and Ethics	2	0	0	2	50		
6	BPHY4008	Clinical Education	0	0	6	3	50		
7	BCEUCT1001	Energy and Environmental Sciences	0	0	1	0.5	20		
8	BLEUCT1002	Creative / Liberal Arts – 0.5 Credit	0	0	1	0.5	20		
		<b>TOTAL</b>	<b>12</b>	<b>0</b>	<b>22</b>	<b>23</b>			

## Semester V

S.No	Course Code	Name of the Course					Assessment Pattern		
			L	T	P	C	IA	CAT	ETE
1	BPHY5001	Clinical Orthopedics & Traumatology	4	0	0	4	10	20	70
2	BPHY5002	General Surgery including burns and plastic surgery & Obstetrics and Gynecology	4	0	0	4	10	20	70
3	BPHY5003	General Medicine, Pediatrics & psychiatry	4	0	0	4	10	20	70
4	BPHY5004	Community Medicine	4	0	0	4	10	20	70
5	BPHY7003	Health Promotion and Fitness	1	0	0	1	10	20	70
6	BPHY5006	Diagnostic imaging for Physiotherapist	1	0	0	1	50		
7	BPHP5010	Clinical education	0	0	8	4	30		70
8	BLLUCT1003	Campus to corporate	3	0	0	3	20	30	50
		<b>TOTAL</b>	<b>21</b>	<b>0</b>	<b>8</b>	<b>25</b>			

## Semester VI

S.No	Course Code	Name of the Course					Assessment Pattern		
			L	T	P	C	IA	CAT	ETE

1	BPHY6001	Physiotherapy in Orthopedics & sports	4	0	0	4	10	20	70
2	BPHY6002	Physiotherapy in General Medicine and General surgery	4	0	0	4	10	20	70
3	BPHY6003	Clinical Neurology & Neurosurgery	3	0	0	3	10	20	70
4	BPHY6004	Professionalism and values	1	0	0	1	10	20	70
5	BPHT7005	Principles of Management (Management of physiotherapy center) + Administration and Teaching Skills	2	0	0	2	10	20	70
6	BPHP 6005	Physiotherapy in Orthopedics & sports (Lab)	0	0	4	2	30		70
7	BPHP6007	Clinical Neurology & Neurosurgery (Lab)	0	0	2	1	30		70
8	BPHP6008	Clinical Posting (One month)	0	0	8	4	50		
		<b>TOTAL</b>	<b>14</b>	<b>0</b>	<b>14</b>	<b>21</b>			

**Semester VII**

S.No	Course Code	Name of the Course					Assessment Pattern		
			L	T	P	C	IA	CAT	ETE
1	BPHY7001	Physiotherapy in Neurology & psychosomatic disorder	4	0	0	4	10	20	70
2	BPHY7002	Biostatistics & Research Methodology in Physiotherapy	4	0	0	4	10	20	70
3	BPHY7004	Clinical cardiovascular & pulmonary	4	0	0	4	10	20	70
4	BPHP7006	Physiotherapy in Neurology & psychosomatic disorder (Lab)	0	0	4	2	30		70
5	BPHP 7008	Clinical Posting (Critique inquiry, case presentation and discussion (Lab)	0	0	12	6	30		70
		<b>TOTAL</b>	<b>12</b>	<b>0</b>	<b>16</b>	<b>20</b>			

**Semester VIII**

S.No	Course Code	Name of the Course					Assessment Pattern		
			L	T	P	C	IA	CAT	ETE
1	BPHY8001	Physiotherapy in cardiovascular, pulmonary and intensive care	4	0	0	4	10	20	70
2	BPHP8002	Community Physiotherapy	3	0	8	4	10	20	70
3	BPHP8006	Physiotherapy in cardiovascular, pulmonary and intensive care (Lab)	0	0	4	2	30		70
4	BPHP8011	Clinical Posting	0	0	16	8	30		70
		<b>TOTAL</b>	<b>7</b>	<b>0</b>	<b>28</b>	<b>18</b>			
<b>INTERNSHIP (6 months)</b>									
		<b>Clinical Internship<sup>x</sup></b>	<b>0</b>	<b>0</b>	<b>960</b>				

Detailed Syllabus

School of Medical and Allied Sciences

<b>Name of The Course</b>	Human Anatomy-I			
<b>Course Code</b>	BPTHY1001			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	4	0	0	4

**Course Objectives**

1. To learn and understand the anatomical terminology in practice of physiotherapy.
2. To interpret the gross and fine structure of human body.
3. To interpret the anatomy of different organs associated to different organ systems.
4. To understand and interpret the knowledge of the structure of different glands

**Course Outcomes**

<b>CO1</b>	To use and learn terminology and language associated with histology
<b>CO2</b>	To use and learn terminology and language associated with embryology
<b>CO3</b>	To interpret the structure of various systems of the Human Body- especially system, Cardio-vascular and respiratory system
<b>CO4</b>	To interpret the structure of visceral organs of the human body
<b>CO5</b>	To study and interpret the endocrine system of the body
<b>CO6</b>	To imagine and predict surface anatomy of thorax , abdomen and pelvis.

**Continuous Assessment Pattern**

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test(CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
10	20	70	100

**Course Content:**

<b>Unit I: General Anatomy-I</b>	<b>12 Hours</b>
<b>General Anatomy:</b> anatomical positions of body, Common anatomical terminologies Bones- Composition, functions, classification and types according to morphology and development.	

Joints-definition-classification, structure of fibrous, cartilaginous joints, blood supply and nerve supply of joints.

- **Histology:**General Histology,
- study of the basic tissues of the body; Microscope, Cell, Epithelium, Connective Tissue, Cartilage, Bone,
- Muscular tissue,
- Nerve Tissue – TS & LS,
- Circulatory system – large sized artery, medium sized artery, large sized vein, lymphoid tissue, Skin and its appendages.

**Unit II:General Anatomy-II** **10 Hours**

- Ovum, Spermatozoa, fertilization and formation of the Germ layers and their derivations.
- Development of skin, Fascia, blood vessels, lymphatic,
- Development of bones, axial and appendicular skeleton and muscles,
- Neural tube, brain vessels and spinal cord,
- Development of brain and brain stem structures

**Unit III: Regional Anatomy: Thorax** **10 Hours**

- Cardio – Vascular System Mediastinum: Divisions and contents Pericardium:
- Thoracic Wall: position, shape and parts of the heart; conducting System; blood Supply and nerve supply of the heart; names of the blood vessels and their distribution in the body – region wise, Applied anatomy of thorax
- Respiratory system - Outline of respiratory passages: Nose and Paranasal sinuses , Larynx , Trachea ,Bronchi ,Mediastinum, Pleura and lungs: position, parts, relations, blood supply and nerve supply; Lungs – emphasize on bronchopulmonary segments , Respiratory movements.
- Diaphragm: Origin, insertion, nerve supply and action, openings in the diaphragm.
- Intercostal muscles and Accessory muscles of respiration: Origin, insertion, nerve supply and action.

**Unit IV: Abdomen and Pelvis** **10 Hours**



- Peritoneum: Parietal peritoneum, visceral peritoneum, folds of peritoneum, functions of peritoneum.
- Large blood vessels of the gut.
- Location, size, shape, features, blood supply,
- Nerve supply and functions of the following: stomach, liver, spleen, pancreas, kidney, urinary bladder, intestines, gall bladder.
- Pelvis: Position, shape, size, features,
- Blood supply and nerve supply of the male and female reproductive system.

**Unit V: Endocrine Glands** **10 Hours**

- Endocrine glands: Position, shape, size, function,
- blood supply and nerve supply of the following glands:
- Hypothalamus and pituitary gland,
- thyroid glands,
- parathyroid glands,
- Adrenal glands,
- Pancreatic islets, ovaries and testes, pineal glands, thymus.

**Unit VI: Surface anatomy**  
**8 hours**

- Thorax
- Abdomen and pelvis
- Cells and tissues – Anatomical nomenclature, Structure and reproduction of cell. Tissues: Epithelial, connective, Muscle and nervous.

**Suggested Reading**

1. B.D. Chaurasia's Handbook of General Anatomy 4<sup>th</sup> edition, CBS Publishers & distributors, 2013, ISBN: 978-8123916545
2. B.D. Chaurasia's Human Anatomy: Regional & Applied dissection and Clinical Upper limb & Thorax (volume-1) 4<sup>th</sup> edition, CBS Publishers & distributors, 2004, ISBN: 81-239-1155-6
3. B.D. Chaurasia's Human Anatomy: Regional & Applied dissection and Clinical Lower limb Abdomen and Pelvis (volume-2) 4<sup>th</sup> edition, CBS Publishers & distributors, 2004, ISBN: 81-239-1156-4

4. H.McMinn, John Pegington, Peter H. Abrahams. A Color Atlas of Human Anatomy 3<sup>rd</sup> edition, M, Mosby, 1996, ISBN: 978-0815158585
5. Richard S. Snell. Clinical Anatomy for Medical Students 6<sup>th</sup> edition, Lippincott Williams & Wilkins, 2000, ISBN: 9780781715744
6. Derek Field. Field's Anatomy, Palpation and Surface Marking 4<sup>th</sup> edition, Butterworth-Heinemann Ltd, 2006, ISBN: 978-0750688482

<b>Name of The Course</b>	<b>Human Physiology -I</b>			
<b>Course Code</b>	<b>BPHY1002</b>			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	4	0	0	4

**Course Objectives**

**The student is expected to study:**

1. The physiological functions of the systems of Human body with special emphasis on nerve- muscle, blood, cardiovascular, respiratory, digestive and endocrine system.
2. The physiological applied principles in the practice of physical therapy.
3. **The metabolic pathways**

**Course Outcomes**

<b>CO1</b>	Illustrate general and nerve muscle physiology.
<b>CO2</b>	Illustrate and identify the normal blood and cardiovascular physiology.
<b>CO3</b>	Demonstrate the respiratory physiology.
<b>CO4</b>	To utilize their knowledge for identification of pathological events occurring in the digestive system.
<b>CO5</b>	To interpret the common pathophysiology of the reproductive endocrine systems in an individual.
<b>CO6</b>	To develop knowledge of applied physiology

**Continuous Assessment Pattern**

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

**Course Content:**

<b>Unit I: General and Nerve Muscle Physiology</b> <b>10 hours</b>
<ul style="list-style-type: none"> <li>❖ Cell: Morphology. Organelles: their structure and functions</li> <li>❖ Transport Mechanisms across the cell membrane</li> <li>❖ Body fluids: Distribution, composition.</li> </ul> <p><b>Nerve Muscle Physiology</b></p> <ul style="list-style-type: none"> <li>❖ Introduction: Resting membrane potential. Action potential – ionic basis and properties.</li> <li>❖ Nerve: Structure and functions of neurons. Classification, Properties and propagation of nerve impulses. Nerve injury – degeneration and regeneration.</li> <li>❖ Neuroglia: Types and functions.</li> <li>❖ Muscle: Classification. Skeletal muscle: Structure. Neuromuscular junction: Structure. Neuromuscular transmission, myasthenia gravis. Excitation- Contraction coupling. Rigor mortis. Motor unit – EMG, Factors affecting muscle-tension.</li> </ul>
<b>Unit II: Blood and Cardiovascular System</b> <b>12 hours</b>
<ul style="list-style-type: none"> <li>❖ Introduction: Composition and functions of blood.</li> <li>❖ Plasma: Composition, formation, functions. Plasma proteins.</li> <li>❖ RBC: count and its variations. Erythropoiesis- stages, factors regulating Reticuloendothelial system (in brief) Haemoglobin –structure, function and derivatives Anemia (in detail), types of Jaundice. Blood indices, PCV, ESR.</li> <li>❖ WBC: Classification. Morphology, functions, count, its variation of each. Immunity</li> <li>❖ Platelets: Morphology, functions, count, its variations</li> <li>❖ Hemostatic mechanisms: Blood coagulation– factors, mechanisms. Their disorders. Anticoagulants.</li> <li>❖ Blood Groups: Landsteiner’s law. Types, significance, determination, Erythroblastosis foetalis.</li> </ul>

- ❖ Blood Transfusion: Cross matching. Indications and complications.
- ❖ Lymph: Composition, formation, circulation and functions.

**Cardiovascular System**

- ❖ Introduction: Physiological anatomy and nerve supply of the heart and blood vessels. Organisation of CVS. Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential. Properties.
- ❖ Conducting system: Components. Impulse conduction Cardiac Cycle: Definition. Phases of cardiac cycle. Pressure and volume curves. Heart sounds – causes, character. ECG: Definition. Different types of leads. Waves and their causes. P-R interval. Heart block.
- ❖ Cardiac Output: Definition. Normal value. Determinants. Stroke volume and its regulation. Heart rate and its regulation. Their variations
- ❖ Arterial Blood Pressure: Definition. Normal values and its variations. Determinants. Peripheral resistance. Regulation of BP.
  - Arterial pulse.
  - Shock – Definition. Classification– causes and features
  - Regional Circulation: Coronary, Cerebral and Cutaneous circulation.
  - Cardiovascular changes during exercise.

**Unit III: Respiratory System** **10 hours****Respiratory System –**

- ❖ Introduction: Physiological anatomy – Pleura, tracheo-bronchial tree, alveolus, respiratory membrane and their nerve supply. Functions of respiratory system. Respiratory muscles.
- ❖ Mechanics of breathing: Intrapleural and Intrapulmonary pressure changes during respiration. Chest expansion. Lung compliance: Normal value, pressure-volume curve, factors affecting compliance and its variations. Surfactant – Composition, production, functions. RDS

- ❖ Spirometry: Lung volumes and capacities. Timed vital capacity and its clinical significance. Maximum ventilation volume. Respiratory minute volume.
- ❖ Dead Space: Types and their definition.
- ❖ Pulmonary Circulation. Ventilation-perfusion ratio and its importance.
- ❖ Transport of respiratory gases: Diffusion across the respiratory membrane. Oxygen transport – Different forms, oxygen-haemoglobin dissociation curve. Factors affecting it. P50, Haldane and Bohr effect. Carbon dioxide transport: Different forms, chloride shift.
- ❖ Regulation of Respiration: Neural Regulation. Hering-breuer's reflex. Voluntary control.
- ❖ Chemical Regulation.
- ❖ Hypoxia: Effects of hypoxia. Types of hypoxia. Hyperbaric oxygen therapy. Acclimatization Hypercapnoea. Asphyxia. Cyanosis – types and features. Dysbarism
- ❖ Disorders of Respiration: Dyspnoea. Orthopnoea. Hyperpnoea, hyperventilation, apnoea, tachypnoea. periodic breathing – types Artificial respiration
- ❖ Respiratory changes during exercise.

**Unit IV: Digestive System** **10 hours**

- ❖ Introduction: Physiological anatomy and nerve supply of alimentary canal. Enteric nervous system
- ❖ Salivary Secretion: Saliva: Composition. Functions. Regulation. Mastication (in brief)
- ❖ Swallowing: Definition. Different stages. Function.
- ❖ Stomach: Functions. Gastric juice: Gland, composition, function, regulation. Gastrin: Production, function and regulation. Peptic ulcer. Gastric motility. Gastric emptying. Vomiting.
- ❖ Pancreatic Secretion: Composition, production, function. Regulation.
- ❖ Liver: Functions of liver. Bile secretion: Composition, functions and regulation. Gall bladder: Functions.
- ❖ Intestine: Succus entericus: Composition, function and regulation of secretion. Intestinal motility and its function and regulation.
- ❖ Mechanism of Defecation

**Unit-V: Endocrine System**  
**10 hours**

- ❖ Introduction: Major endocrine glands. Hormone: classification, mechanism of action. Functions of hormones
- ❖ Pituitary Gland: Anterior Pituitary and Posterior Pituitary hormones: Secretory cells, action on target cells, regulation of secretion of each hormone. Disorders: Gigantism, Acromegaly, Dwarfism, Diabetes insipidus. Physiology of growth and development: hormonal and other influences.
- ❖ Pituitary-Hypothalamic Relationship.
- ❖ Thyroid Gland: Thyroid hormone and calcitonin: secretory cells, synthesis, storage, action and regulation of secretion. Disorders: Myxedema, Cretinism, Grave's disease.
- ❖ Parathyroid hormones: secretory cell, action, regulation of secretion. Disorders: Hypoparathyroidism. Hyperthyroidism. Calcium metabolism and its regulation.
- ❖ Adrenal Gland: Adrenal Cortex: Secretory cells, synthesis, action, regulation of secretion of Aldosterone, Cortisol, and Androgens. Disorders: Addison's disease, Cushing's syndrome, Conn's syndrome, Adrenogenital syndrome.
- ❖ Adrenal Medulla: Secretory cells, action, regulation of secretion of adrenaline and noradrenaline. Disorders: Pheochromocytoma.
- ❖ Endocrine Pancreas: Secretory cells, action, regulation of secretion of insulin and glucagon. Glucose metabolism and its regulation. Disorder: Diabetes mellitus.
- ❖ Calcitriol, Thymus and Pineal gland (very brief).
- ❖ Local Hormones. (Briefly)

**Unit VI: Applied Physiology**  
**8 hours**

- Nervous system
- ❖ Muscles and Nervous System Functions
  - ❖ Neuromuscular transmission, Types of nerve fibers. Action potential, Strength-duration curve, ECG, EMG, VEP, NCV
  - ❖ Degeneration and regeneration of nerve, Reactions of denervation.
  - ❖ Receptor physiology
  - ❖ Synapse-structure
  - ❖ Reflexes

- ❖ Physiology of touch, pain, temperature and proprioception
- ❖ Function of Basal Ganglia, Thalamus, Hypothalamus, Pre-Frontal Lobe, Reticular activating system, cerebellum.
- ❖ Sensory/motor cortex
- ❖ Learning, memory and condition reflex
- ❖ Limbic system
- ❖ Physiology of voluntary movements
- ❖ A.N.S – Sympathetic / Parasympathetic system – adrenal medulla functions – Neurotransmitters.

#### Blood functions

- ❖ Thalassemia Syndrome, Hemophilia, VWF
- ❖ Anemia, Leukocytosis
- ❖ Bone marrow transplant
- ❖ Cardio vascular Functions: Blood flow through arteries, arterioles, capillaries, veins and venuoles.
- ❖ Circulation of Lymph, Oedema
- ❖ Factors affecting cardiac output.
- ❖ Circulatory adjustment in exercise and in postural and gravitational changes,
- ❖ Pathophysiology of fainting and heart failure.

#### Pulmonary Functions

- ❖ Properties of gases, Mechanics of respiration, Diffusion capacity, special features of pulmonary circulation and their application.
- ❖ Respiratory adjustments in exercises.
- ❖ Artificial respiration
- ❖ Breath sounds.

#### Digestive system

- ❖ Physiological basis of Peptic Ulcer, Jaundice, GIT disorders and Dietary fibers.

3. A.C.Guyton, J.E. Hall. Textbook of Medical Physiology 11<sup>th</sup> edition, Elsevier Saunders, 2006, ISBN: 9780721602400
4. R. L. Bijlani, S. Manjunatha. Understanding Medical Physiology: A textbook for Medical Students 4<sup>th</sup> edition, Jaypee Brothers Medical Publishers (P) Ltd, 2011, ISBN: 978-80704-81-4

<b>Name of The Course</b>	BIOCHEMISTRY			
<b>Course Code</b>	BPHY1003			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	3	0	0	3

#### Course Objectives

##### To study:

- The Clinical Biochemistry
- **The various metabolic pathways**
- **The basic knowledge and requirements of vitamins, minerals and nutrition.**

#### Course Outcomes

<b>CO1</b>	<b>To understand the clinical biochemistry.</b>
<b>CO2</b>	<b>To understand the importance of nutrition</b>
<b>CO3</b>	<b>To know the structure of electrolytes, acid base balance and water in the human body.</b>
<b>CO4</b>	<b>To have general understanding of the major types of biochemical molecules, including small, large and super-molecular components found in cells.</b>
<b>CO5</b>	<b>To have firm foundations about the fundamentals of vitamins, hormone, cell and molecular biology.</b>
<b>CO6</b>	<b>To develop understanding of recent advances in biochemistry</b>

#### Suggested Reading

1. Dr. A. K. Jain. Textbook of Physiology (Set of 2 Volumes) 5<sup>th</sup> Edition, Avichal Publishing Company, ISBN: 9788177393583
2. Dr. A. K. Jain. Manual Of Practical Physiology For Mbbs 4<sup>th</sup> edition, Avichal Publishing Company, ISBN: 9788178553153

#### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

**Course Content:****Unit I: Introduction to Biochemistry****7 Hours**

- ❖ **Biochemistry of Connective tissue**
  - Introduction
  - connective tissue proteins: Collagen, elastin - Structure and associated disorders
  - Glycoproteins
  - Proteoglycans.
- ❖ **Muscle Contraction -**
  - Contractile elements in muscle
  - Process of muscle contraction
  - Energy for muscle contraction
  -
- ❖ **Clinical Biochemistry –**
  - Normal levels of blood and urine constituents, Relevance of blood and urine levels of Glucose, Urea, Uric acid, Creatinine, Calcium, Phosphates, pH and Bicarbonate. Liver function tests, Renal function tests.

**Unit II: Introduction to Nutrition****9 Hours**

- ❖ **Nutrition –**
  - Introduction, Importance of nutrition Calorific values, Respiratory quotient – Definition, and its significance Energy requirement of a person - Basal metabolic rate: Definition, Normal values, factor affecting BMR Special dynamic action of food.
  - Physical activities - Energy expenditure for various activities. Calculation of energy requirement of a person
  - Balanced diet
    - Recommended dietary allowances
    - Role of carbohydrates in diet: Digestible carbohydrates and dietary fibers
    - Role of lipids in diet
    - Role of proteins in diet: Quality of proteins - Biological value, net protein utilization, Nutritional aspects of proteins-essential and non-essential amino acids. Nitrogen balance

**-Nutritional disorders.**

- ❖ **Carbohydrate Chemistry –**
  - Definition, general classification with examples, Glycosidic bond
  - Structures, composition, sources, properties and functions of Monosaccharides, Disaccharides, Oligosaccharides and Polysaccharides.
  - Glycosaminoglycan (mucopolysaccharides)
- ❖ **Lipid Chemistry –**
  - Definition, general classification
  - Definition, classification, properties and functions of Fatty acids, Triacylglycerol, Phospholipids, Cholesterol
  - Essential fatty acids and their importance
  - Lipoproteins: Definition, classification, properties, Sources and function Ketone bodies
- ❖ **Amino-acid Chemistry –**
  - Amino acid chemistry: Definition, Classification, Peptide bonds
  - Peptides: Definition, Biologically important peptides
  - Protein chemistry: Definition, Classification, Functions of proteins,
- ❖ **Nucleotide and Nucleic acid Chemistry –**
  - Nucleotide chemistry: Nucleotide composition, functions of free nucleotides in body.
  - Nucleic acid (DNA and RNA) chemistry: Difference between DNA and RNA, Structure of DNA (Watson and Crick model), Functions of DNA. Structure and functions of tRNA, rRNA, mRNA.

**I**

- ❖ **Electrolyte balance –**
  - Osmolarity. Distribution of electrolytes.
  - Electrolyte balance: Role of aldosterone, rennin angiotensin system and ANF.
- ❖ **Acid-Base balance –**
  - Acids, bases and buffers, pH. Buffer systems of the body, bicarbonate buffer system Role of lungs and kidneys in acid base balance, Acid base imbalance.
- ❖ **Water balance –**



Water distribution in the body, Body water, water turnover, Regulation of water balance: role of ADH and thirst Centre.

❖ **Enzymes –**

Definition, Active site, Cofactor (Coenzyme, Activator), Proenzyme. Classification with example, Factors effecting enzyme activity, Enzyme inhibition and significance, Isoenzymes, Diagnostic enzymology (clinical significance of enzymes), Inhibition and types of inhibitors, Clinical and therapeutic use of enzymes.

**Unit IV: Introduction to Metabolism**

**9 Hours:**

❖ **Lipid Metabolism –**

**Introduction to lipid metabolism, Lipolysis, Oxidation of fatty acids -oxidation of fatty acids**

- Lipogenesis - Denovo synthesis of fatty acids, chain elongation, desaturation, triacylglycerol synthesis, fat metabolism in adipose tissues
- Ketone body metabolism: Ketone body formation (ketogenesis), utilization (ketolysis), ketosis, Rothera's test.
- Cholesterol metabolism: synthesis, degradation, cholesterol transport e. Hypercholesterolemia and its effects (atherosclerosis and coronary heart diseases) Hypocholesterolemic agents, Common hyperlipoproteinemia, Fatty liver

❖ **Carbohydrate Metabolism –**

- Introduction, Glycolysis – Aerobic, Anaerobic Citric acid cycle, Substrate level phosphorylation.
- Glycogen metabolism – Glycogenesis, Glycogenolysis, Metabolic disorders glycogen, Gluconeogenesis, Cori cycle, Significance of HMP Shunt.
- Hormonal regulation of glucose, Glycosuria, Diabetes mellitus.
- Amino acid and Protein Metabolism - a. Catabolism of amino acids - Introduction, transamination, deamination, Fate of ammonia, transport of ammonia, Urea cycle b. Specialized products formed from amino acids - from glycine, arginine, methionine, phenylalanine and tyrosine.

❖ **Mineral Metabolism-**

- Definition, Sources, RDA, Digestion, absorption, transport, excretion, functions, disorder of Individual minerals - Calcium, phosphate, iron, Magnesium, fluoride, selenium, molybdenum, copper. Phosphate, calcium and iron in detail.

**Unit V: Introduction to Vitamins, Hormone & Cell**

**Biology**

**9**

**Hours**

❖ **Vitamins -**

- Definition, classification according to solubility, b. Individual vitamins - Sources, Coenzyme forms, functions, RDA, digestion, absorption and transport, deficiency and toxicity.

❖ **Hormone Action –**

- Definition, classification, Mechanism of hormone action. Receptors, signal transduction, second messengers and cell function.

❖ **Cell Biology –**

- Introduction, Cell structure, Cell membrane structure and function, various types of absorption. Intracellular organelles and their functions, briefly on cytoskeleton.

**Unit VI: Recent advances in Biochemistry**  
**8 Lectures**

- ❖ Keto diet and its dietary allowance.
- ❖ Recent advances in segregation of proteins, fats, etc.
- ❖ Biotechnology and its role in research
- ❖ Bioinformatics and its role in research

**Suggested Reading**

- **Textbook of Medical Biochemistry –Chatterjee and Shinde**
- **T.B of Biochemistry for medical students- Vasudevan D.M-Jaypee Bros.10th edition**
- **T.B of Biochemistry-Chatterjee M.N- Jaypee Bros 6<sup>th</sup> edition**

- **Clinical Biochemistry-Metabolic & Clinical Aspects-Marshall & Bangart-Churchill Livingstone.**
- **M.N. Chatterjea, Rana Shinde. Text Book of Medical Biochemistry 7<sup>th</sup> edition, Jaypee Brothers Medical Publishers (P) Ltd, 2007, ISBN: 9788184481341**
- **Robert K. Murray, Darryl K. Granner, Peter A. Mayes, Victor W. Rodwell, Harper's Illustrated Biochemistry 26<sup>th</sup> edition. Mcgraw-hill, 2003, ISBN: 9780071389**
- **Lehninger Principle of Biochemistry 5<sup>th</sup> edition, David L Nelson, Michael M Cox, W. H. Freeman publishers, 2008, ISBN: 978-0716771081**
- **Biochemistry Southerland-Churchill Livingstone**

	environment and emotions of the health of a person.
CO3	To understand the influence of society and social changes on the health and its rehabilitation

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

### Course Contents:

Unit I: Introduction to sociology	10 hours
<ul style="list-style-type: none"> <li>❖ <b>Meaning-Definition and scope of Sociology</b></li> <li>❖ Methods of Sociological investigations- Case study, social survey, questionnaire, Interview and opinion poll methods.</li> <li>❖ <b>Importance of its study with special reference to health care professionals.</b></li> <li>❖ Social Factors in Health and Disease-Meaning &amp; Role</li> <li>❖ Concept of Health, Concept of Culture</li> <li>❖ Culture and Health, Culture and Health Disorders</li> <li>❖ Application of knowledge of sociology in physiotherapy.</li> </ul>	
Unit II Family & Community	10 hours
<ul style="list-style-type: none"> <li>❖ Family-Meaning, definition and Functions, Changing family Patterns</li> <li>❖ Influence of family on the individual health, family and nutrition. The effects of sickness on family and psychosomatic disease and their importance to Physiotherapy.</li> <li>❖ Community Rural &amp; Urban Community-Meaning and features-Health hazards of both</li> </ul>	
Unit III: Social problems, change & security	10 hours
<p>Consequences of the following social problems in relation to sickness and Disability, remedies to prevent these problems.</p> <ul style="list-style-type: none"> <li>❖ Population explosion</li> <li>❖ Poverty and unemployment</li> <li>❖ Beggary</li> <li>❖ Juvenile delinquency, geriatric problems.</li> <li>❖ Prostitution</li> <li>❖ Alcoholism</li> </ul>	

<b>Name of The Course</b>	<b>SOCIOLOGY</b>			
<b>Course Code</b>	<b>BPHY1004</b>			
<b>Prerequisite</b>				
<b>Corequisite</b>				
<b>Antirequisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>

### Course Objectives

To study

1. the basic sociology concepts, principles and social process
2. social institutions in relation to the individual, family and community
3. the various social factors affecting the family in rural and urban communities in India.

### Course Outcomes

CO1	To apply the principles of sociology for understanding the disease process and formulating a holistic treatment for the patients.
CO2	To understand the importance of the status of a person in society for his physical, mental and social health and the influence of the

- ❖ **Problems of women in employment**, Social change: Meaning, 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 security and social legislation in relation to the Disabled.
- ❖ Social worker- Meaning of social work; the role of a medical social worker.
- ❖ Socialization – Meaning, influence of social factor on personality, Socialization in hospitals and in the rehabilitation of patients.
- ❖ Role of primary and secondary social groups in the hospitals and rehabilitation settings.

### Suggested Reading

- Introduction to Sociology, Vidhya Bhushan, D.R. Sachdeva, Kitab Mahal Publishers, 2005, ISBN: 9788122501070
- The Structure of Sociological Theory 1<sup>st</sup> edition, J. H. Turner, Dorsey publisher, 1974, ASIN: B0039BDDEM
- Nation Building in India: culture, power & Society, Anand Kumar, Radiant publishers, 1999, ISBN: 9788170272281
- Social Psychology 12th edition, Robert A. Baron, Nyla R. Branscombe, Donn Byrne, Allyn & Bacon publishers, 2008, ISBN : 978-0205581498

<b>Name of The Course</b>	Introduction of Health Delivery System in India			
<b>Course Code</b>	BPTHY1005			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	2	0	0	2

### Course Objectives

1. To Study the National Health Policy, National health Program. and process a holistic treatment for the patients.
2. To Study the need for integration of various system of medicine.
3. To Study the Significance and impact of vital statistics on health Policy.

### Course Outcomes

<b>CO1</b>	To understand the importance of Health care delivery system & National health Program.
<b>CO2</b>	To understand the need for integration of various system of medicine.
<b>CO3</b>	To understand the importance of knowledge of Demography & Epidemiology.

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
50	-	-	50

### Course Content:

#### Unit I: Introduction to Healthcare delivery system & National Health Program

10 Hours

- Healthcare delivery system in India at primary, secondary and tertiary care
- Community participation in healthcare delivery system
- Health system in developed countries.
- Private Sector
- National Health Mission
- National Health Policy
- Issues in Health Care Delivery System in India
- Background objectives, action plan, targets, operations, achievements and constraints Various National Health Programme.
- Health scenario of India- past, present and future

#### Unit II: Introduction to AYUSH system of Medicine

10 Hours

Introduction to

- Ayurveda.
- Naturopathy



- Unani
- Siddha
- Homeopathy

**Need for integration of various system of medicine.**

### Unit III: Demography & Epidemiology

**10 Hours:**

- Demography – its concept
- Vital events of life & its impact on demography
- Significance and recording of vital statistics
- Census & its impact on health policy.
- Principles of Epidemiology
- Natural History of disease

4. Interactions with patients, family and communities.
5. concept of professionalism and ethics
6. understanding of role of physiotherapist in multidisciplinary team.
7. Immunization requirements of healthcare professionals.
8. Basic life support in skill labs.
9. personal hygiene and its importance.
10. COVID-19 community spread.

#### Suggested Readings:

- **Foundation of Community Medicine. CM Dhaar, Rubbani**
- **Community Medicine (With Recent Advances) by Suryakantha AH, Jaypee Publications**
- **A Comprehensive textbook of Community Medicine, Mathur**

**Principles & Practice of Community Medicine, Asma Rahim, Jaypee Publication**

<b>Name of The Course</b>	HUMAN ANATOMY LAB			
<b>Course Code</b>	BPHP1009			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	0	0	4	2

#### Course Objectives

<b>Name of The Course</b>	Community orientation and clinical visit			
<b>Course Code</b>	BPHY1008			
<b>Prerequisite</b>				
<b>Corequisite</b>				
<b>Antirequisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	0	0	2	1

#### Course Objectives:

1. To understand the community orientation programmes, Models of CBR.
2. To apply knowledge of physiotherapy during the clinical visits & health camps

#### Course Outcomes

CO1	To understand the community orientation
CO2	To apply knowledge during the clinical visits & health camps

#### Continuous Assessment Pattern

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test(CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
50	00	00	50

#### Course Contents:

<b>List of Practical</b>	<b>15 hours</b>
<ol style="list-style-type: none"> <li>1. Introduction to institution, Role of physiotherapist in society</li> <li>2. First aid, BLS</li> <li>3. National health goals and policies</li> </ol>	

1. To learn and understand the anatomical terminology in practice of physiotherapy.
2. To interpret the gross and fine structure of human body.
3. To interpret the anatomy of different organs associated to different organ systems.

Practical 9	To study about surface anatomy of Male reproductive system by specimen, models and charts.
Practical 10	To study about surface anatomy of Female reproductive system by specimen, models and charts.

### Course Outcomes

CO1	To learn terminology and histology of structures associated with bones of human body
CO2	To learn terminology and histology of structures associated with Joints of human body
CO3	To interpret the structural anatomy and muscle associated with the structure in Thorax
CO4	To interpret the structural anatomy and muscle associated with the structure in Abdominal cavity
CO5	To interpret the structural anatomy and muscle associated with the structure in human reproductive system

### Continuous Assessment Pattern

Internal Assessment (IA)	Mid Term Test (CAT)	End Term Test (ETE)	Total Marks
30	00	70	100

### List of Practical

75 hours

Practical 1	To study about the movements at different joints of human body.
Practical 2	To study about the Joint Classification.
Practical 3	To study about surface marking of Thorax and muscles associated to thorax.
Practical 4	To study about surface anatomy of respiratory system by specimen, models and charts.
Practical 5	To study about surface anatomy of cardio vascular system by specimen, models and charts.
Practical 6	To study about surface marking of Abdominal cavity and muscles associated to abdomen.
Practical 7	To study about surface anatomy of digestive system by specimen, models and charts.
Practical 8	To study about surface anatomy of urinary system by specimen, models and charts.

### Text Book (s):

1. B.D. Chaurasia's Handbook of General Anatomy 4<sup>th</sup> edition, CBS Publishers & distributors, 2013, ISBN: 978-8123916545
2. B.D. Chaurasia's Human Anatomy: Regional & Applied dissection and Clinical Upper limb & Thorax (volume-1) 4<sup>th</sup> edition, CBS Publishers & distributors, 2004, ISBN: 81-239-1155-6
3. B.D. Chaurasia's Human Anatomy: Regional & Applied dissection and Clinical Lower limb Abdomen and Pelvis (volume-2) 4<sup>th</sup> edition, CBS Publishers & distributors, 2004, ISBN: 81-239-1156-4

### Reference Book (s):

1. H.McMinn, John Pegington, Peter H. Abrahams. A Color Atlas of Human Anatomy 3<sup>rd</sup> edition, M, Mosby, 1996, ISBN: 978-0815158585
2. Richard S. Snell. Clinical Anatomy for Medical Students 6<sup>th</sup> edition, Lippincott Williams & Wilkins, 2000, ISBN: 9780781715744
3. Derek Field. Field's Anatomy, Palpation and Surface Marking 4<sup>th</sup> edition, Butterworth-Heinemann Ltd, 2006, ISBN: 978-0750688482

Name of The Course	Human Physiology -I(Lab)			
Course Code	BPHY1010			
Prerequisite				
Co-requisite				
Anti-requisite				
	L	T	P	C
	0	0	2	1

### Course Objectives

The student is expected to study:

1. The physiological functions of the systems of Human body with special emphasis on haematology and amphibian experiments.
2. The physiological principles in the practice of physical therapy.

### Course Outcomes

<b>CO1</b>	Utilize their knowledge for identification of various pathological events that are leading to the disease process.
<b>CO2</b>	To gain an understanding of the basics of clinical examination for diagnosis of the disease process.

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
30	00	70	100

### Course Content:

List of Practical	15 Hours
<ol style="list-style-type: none"> <li>1. Study of Microscope and its uses</li> <li>2. Determination of RBC count, WBC count, Differential leukocyte count</li> <li>3. Estimation of hemoglobin</li> <li>4. Determination of blood group, bleeding time, clotting time Demonstrations only</li> <li>5. Calculation of blood indices</li> <li>6. Determination of blood group, bleeding time, clotting time Demonstrations only</li> <li>7. Determination of ESR, PCV</li> <li>8. Simple muscle curve, Effect of increasing the strength of the stimuli, Effect of two successive stimuli.</li> <li>9. Effect of temperature on muscle contraction, Effect of load on muscle contraction</li> <li>10. Effect of Fatigue, Genesis of tetanus and clonus.</li> </ol>	

### Suggested Reading

1. Dr. A. K. Jain. Textbook of Physiology (Set of 2 Volumes) 5th Edition, Avichal Publishing Company, ISBN: 9788177393583

2. Dr. A. K. Jain. Manual of Practical Physiology For Mbbs 4<sup>th</sup> edition, Avichal Publishing Company, ISBN: 9788178553153
3. A.C.Guyton, J.E. Hall. Textbook of Medical Physiology 11<sup>th</sup> edition, Elsevier Saunders, 2006, ISBN: 9780721602400
4. R. L. Bijlani, S. Manjunatha. Understanding Medical Physiology: A textbook for Medical Students 4<sup>th</sup> edition, Jaypee Brothers Medical Publishers (P) Ltd, 2011, ISBN: 978-80704-81-4
5. Kim E.Barrett, Susan M Burman, Scott Boitano, Heddwen L. Brooks. Ganong's Review of Medical Physiology 24<sup>th</sup> edition, McGraw-Hill Medical Publishers, 2012, ISBN: 978-0071780032

<b>Name of The Course</b>	BIOCHEMISTRY LAB			
<b>Course Code</b>	BPHP1011			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	0	0	2	1

### Course Objectives

#### To study:

- The Clinical Biochemistry
- The various metabolic pathways
- The basic knowledge and requirements of vitamins, minerals and nutrition.

### Course Outcomes

<b>CO1</b>	To understand the clinical biochemistry.
<b>CO2</b>	To understand the importance of nutrition

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
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30	-	70	100
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**Course Content:**

<b>List of Practicals</b>	<b>15</b>
<b>hours</b>	
<ol style="list-style-type: none"> <li>To Study Biochemistry of Connective Tissues.</li> <li>To Study Muscle Contraction phenomena.</li> <li>To Study Clinical Biochemistry.</li> <li>To Study Balanced Diet plan for diabetics and weight loss</li> <li>To study about vitamins</li> <li>To Study Factors affecting Enzyme Activity</li> <li>To Study Nucleotide &amp; Nucleic acid Chemistry</li> <li>To study mechanism of hormone action.</li> <li>To study cell biology.</li> <li>To study structure of electrolytes</li> </ol>	

**Suggested Reading**

- Lab Manual provided by Subject Teacher
- Textbook of Medical Biochemistry –Chatterjee and Shinde**
- T.B of Biochemistry for medical students- Vasudevan**
- D.M-Jaypee Bros.10th edition**
- T.B of Biochemistry-Chatterjee M.N- Jaypee Bros 6<sup>th</sup> edition**

<b>Name of The Course</b>	Basic computer and information science (Lab)			
<b>Course Code</b>	BPHY1012			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

**Course Objectives**

- Computer technology.
- The course has focus on computer organization, computer operating system and software, and MS windows, Word processing, Excel data worksheet and PowerPoint presentation.

**Course Outcomes**

<b>CO1</b>	To know basic of computers
<b>CO2</b>	To apply the concept of windows & MS-word, power point and excel.

**Continuous Assessment Pattern**

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test(CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
<b>50</b>	<b>00</b>	<b>00</b>	<b>50</b>

**Course Content: 15 hours**

<b>Practical 1</b>	Data entry efficiency
<b>Practical 2</b>	Learning to use MS office: MS word
<b>Practical 3</b>	Learning to use of MS PowerPoint
<b>Practical 4</b>	Learning to use of MS excel 5 hours
<b>Practical 5</b>	Learning to use different operating system & its application.

**Suggested Reading**

- Introduction to Computers by Dr Darrell W Hajek
- (Lecture Notes in Computer Science 1491) W. Reisigs, G. Rozenberg (auth.), Wolfgang Reisig, GrzegorzRozenberg (eds.) - Lectures on Petri Nets I\_ Basic Models\_ Advances in Petri Nets-Springer-VerlagB.djvu
- Introduction to Computer Systems for Health Information Technology by Nanette B Sayles

<b>Name of The Course</b>	<b>Introduction to Yoga- Basic theory, science and techniques (Lab)</b>			
<b>Course Code</b>	<b>BPHY1013</b>			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

**Course Objectives**

1. The learn principles of yoga techniques e.g. asana, meditation, relaxation, stretching, strengthening

2. To understand the basic science

### Course Outcomes

CO1	Demonstrate the basic techniques of the beginner group of asanas and various groups of asanas according to the body position
CO2	Illustrate the Relaxation techniques of Yoga.

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
50			50

Course Content:  
hours

15

#### Practical 1:

Sukshma Vyayama/Sithilikarna Vyayama and Surya Namaskar s

- Loosening exercises of each part of the body particularly of the joints
- b. 12 step Surya namaskar with prayer and specific mantras

#### Practical 2: Yogic kriyas [Observation/ demonstration only]

- Neti (Jala Neti, Sutra Neti)
- Dhauti (Vamana Dhauti, Vastra Dhauti)
- Trataka
- Shankaprakshalana (Laghu & Deergha)

#### Practical 3:

##### Yogasanas

- a. Standing postures
  - Tadasana (Upward stretch posture)
  - Ardha Chakrasana (Half wheel posture)
  - Ardha Katicakrasana (Half lumber wheel posture)

- iv. Utkatasana (Chair posture)
- v. Pada Hastasana (Hand to toes posture)
- vi. Trikonasana (Triangle posture)
- vii. Parshva Konasana (Side angle posture)
- viii. Garudasana (Eagle posture)
- ix. Vrikshasana (Tree posture)

#### Practical 4: Pranayamas

##### b. Prone postures

- i. Makarasana (Crocodile posture)
- ii. Bhujangasana (Cobra posture)
- iii. Salabhasana (Locust posture)
- iv. Dhanurasana (Bow posture)
- v. Naukasana (Boat posture)
- vi. Marjalasana (Cat posture)

#### Practical 5: Pranayamas

- **Supine postures**
  - Ardha halasana/ Uttana Padasana
  - Sarvangasana (All limb posture)
  - Pawana muktasana (Wind releasing posture)
  - Matsyasana (Fish posture)
  - Halasana (Plough posture)
  - Chakrasana (Wheel posture)
  - Setu Bandhasana (Bridge posture)
  - Shavasana (Corpse posture)

#### Practical 6: Pranayamas

- **Sitting postures**
  - Parvatasana (Mountain posture)
  - Bhadrasana (Gracious posture)
  - Vajrasana (Adamantine posture)
  - Paschimottanasana (Back stretching posture)
  - Janushirasana (Head to knee posture)
  - Simhasana (Lion posture)
  - Gomukhasana (Cow head posture)
  - Ushtrasana (Camel posture)

**Practical 7: Pranayamas : practice of correct breathing and Yogic deep breathing**

- Kapalabhati
- Bhastrika
- Sitali
- Sitkari

**Practical 8: Meditative postures and Meditation techniques**

- Siddhasana (Accomplished pose)
- Padmasana (Lotus posture)
- Samasana
- Swastikasana (Auspicious posture)

**Practical 9: Pranayamas**

- Sadanta
- Ujjayi
- Surya Bhedana
- Chandra Bhedana
- Anuloma-Viloma/Nadishodana
- Bhramari

**Practical 10: Relaxation Techniques**

- Shavasana
- Yoga Nidra

- Dr. K. Ramesh Babu, “Aasana Sutras”, Home of Yoga Publication, Vizinagaram
- Swami Prabhavananda “Patanjali Yoga Sutras”, Sri Ramakrishna Math, Chennai, ISBN: 81-7823-108-5

<b>Name of The Course</b>	<b>Human Anatomy-II</b>			
<b>Course Code</b>	<b>BPHY2001</b>			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	4	0	0	4

**Course Objectives**

**The student is expected to study:**

1. Understanding of gross anatomy of various body parts.
2. Application of knowledge of anatomy to learn evaluation and application of physical therapy.
3. Major emphasis of learning is towards Musculo-skeletal, upper & lower extremity, head, neck, pelvis and nervous system.

**Course Outcomes**

<b>CO1</b>	Illustrate and identify the musculoskeletal anatomy and upper extremity anatomy
<b>CO2</b>	Interpret the anatomy of lower extremity and application of knowledge in patient evaluation and management
<b>CO3</b>	Identify and apply knowledge of trunk and pelvis anatomy in patient evaluation and management
<b>CO4</b>	Illustrate anatomy of head & neck anatomy and apply knowledge in evaluation and management of patient
<b>CO5</b>	Interpret the anatomy of nervous system and application of knowledge in patient evaluation and management
<b>CO6</b>	Imagine Surface markings

**Continuous Assessment Pattern**

**Suggested Reading**

- Swami SatyanandaSaraswati, ”Asana, Pranayama, MudraBandha”, Yoga Publication Trust, Thomson Press(India) Limited, 2013, ISBN: 978-81-86336-14-4
- Swami Muktibodhananda, “Hatha Yoga Pradipika”, Yoga Publication Trust, Yoga Publication Trust, Thomson Press(India) Limited, 2012, ISBN:978-81-85787-38-1
- Dr Swami Karmnanda , “Yogic Management of Common Diseases”, Yoga Publication Trust, Yoga Publication Trust, Thomson Press(India) Limited, 2013, ISBN: 978-81-85787-24-4



Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

**Course Content:**

<b>Unit I: Musculoskeletal Anatomy &amp; Upper extremity</b> <b>10 hours</b>	
<ul style="list-style-type: none"> <li>❖ Upper Extremity               <ol style="list-style-type: none"> <li>i. Osteology: Clavicles, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges.</li> <li>ii. Soft parts: Breast, pectoral region, axilla, front of arm, back of arm, cubital fossa, front of fore arm, back of fore arm, palm, dorsum of hand, muscles, nerves, blood vessels and lymphatic drainage of upper extremity.</li> <li>iii. Joints: Shoulder girdle, shoulder joint, elbow joints, radio ulnar joint, wrist joint and joints of the hand.</li> <li>iv. Arches of hand, skin of the palm and dorsum of hand.</li> </ol> </li> </ul>	
<b>Unit II: Lower Extremity</b> <b>12 hours</b>	<b>12</b>
<ul style="list-style-type: none"> <li>❖ Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges.</li> <li>❖ Soft parts: Gluteal region, front and back of the thigh (Femoral triangle, femoral canal and inguinal canal), medial side of the thigh (Adductor canal), lateral side of the thigh, popliteal fossa, anterior and posterior compartment of leg, sole of the foot, lymphatic drainage of lower limb, venous drainage of the lower limb, arterial supply of the lower limb, arches of foot, skin of foot.</li> <li>❖ Joints: Hip Joint, Knee joint, Ankle joint, joints of the foot.</li> </ul>	
<b>Unit III: Trunk &amp; Pelvis</b> <b>10 hours</b>	<b>10</b>

<ul style="list-style-type: none"> <li>❖ Osteology: Cervical, thoracic, lumbar, sacral and coccygeal vertebrae and ribs.</li> <li>❖ Soft tissue: Pre and Para vertebral muscles, intercostals muscles, anterior abdominal wall muscles, Inter-vertebral disc.</li> <li>❖ Pelvic girdle and muscles of the pelvic floor.</li> <li>❖ of various system of medicine.</li> </ul>	
<b>Unit IV: Head &amp; Neck</b> <b>10 hours</b>	<b>10</b>
<ul style="list-style-type: none"> <li>❖ Osteology: Mandible and bones of the skull.</li> <li>❖ Soft parts: Muscles of the face and neck and their nerve and blood supply-extra ocular muscles, triangles of the neck.</li> <li>❖ Gross anatomy of eyeball, nose, ears and tongue.</li> </ul>	
<b>Unit-V: Neuroanatomy</b> <b>10 hours</b>	
<ul style="list-style-type: none"> <li>❖ Cranial nerves</li> <li>❖ Peripheral nervous system</li> <li>❖ Peripheral nerve</li> <li>❖ Neuromuscular junction</li> <li>❖ Sensory end organs</li> <li>❖ Central Nervous System</li> <li>❖ Spinal segments and areas</li> <li>❖ Brain Stem</li> <li>❖ Cerebellum</li> <li>❖ Inferior colliculi</li> <li>❖ Superior Colliculi</li> <li>❖ Thalamus</li> <li>❖ Hypothalamus</li> <li>❖ Corpus striatum</li> <li>❖ Cerebral hemisphere</li> <li>❖ Lateral ventricles</li> <li>❖ Blood supply to brain</li> <li>❖ Basal Ganglia</li> <li>❖ The pyramidal system</li> <li>❖ Pons, medulla, extra pyramidal systems</li> <li>❖ Anatomical integration</li> </ul>	
<b>Unit VI: Surface Markings:</b> <b>8 hours</b>	<b>8</b>

**Surface markings of**

- ❖ Upper limb
- ❖ Lower limb
- ❖ Head and neck

**Suggested Reading**

1. B.D. Chaurasia's Handbook of General Anatomy 4<sup>th</sup> edition, CBS Publishers & distributors, 2013, ISBN: 978-8123916545
2. B.D. Chaurasia's Human Anatomy: Regional & Applied dissection and Clinical Upper limb & Thorax (volume-1) 4<sup>th</sup> edition, CBS Publishers & distributors, 2004, ISBN: 81-239-1155-6
3. B.D. Chaurasia's Human Anatomy: Regional & Applied dissection and Clinical Lower limb Abdomen and Pelvis (volume-2) 4<sup>th</sup> edition, CBS Publishers & distributors, 2004, ISBN: 81-239-1156-4
4. H.McMinn, John Pegington, Peter H. Abrahams. A Color Atlas of Human Anatomy 3<sup>rd</sup> edition, M, Mosby, 1996, ISBN: 978-0815158585
5. Richard S. Snell. Clinical Anatomy for Medical Students 6<sup>th</sup> edition, Lippincott Williams & Wilkins, 2000, ISBN: 9780781715744
6. Derek Field. Field's Anatomy, Palpation and Surface Marking 4<sup>th</sup> edition, Butterworth-Heinemann Ltd, 2006, ISBN : 978-0750688482

<b>Name of The Course</b>	Human Physiology – II			
<b>Course Code</b>	BPHY2002			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

**Course Objectives**

1. The physiological functions of the systems of Human body with special emphasis on renal system, reproductive system, nervous system, special senses and physiological effects of exercise
2. The physiological principles in the practice of physical therapy.

**Course Outcomes**

<b>CO1</b>	Illustrate and identify the renal system physiology.
<b>CO2</b>	Interpret the physiology of reproductive system.
<b>CO3</b>	Illustrate the physiology of the nervous system and interpret its role in normal function.
<b>CO4</b>	Interpret the physiology of special senses.
<b>CO5</b>	Illustrate and identify the physiology of exercise.
<b>CO6</b>	To develop understanding of applied physiology

**Continuous Assessment Pattern**

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test(CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
10	20	70	100

**Course Content:**

<b>Unit I: Renal System</b>	<b>10 hours</b>
<ul style="list-style-type: none"> <li>• Introduction: Nephrons – cortical and juxtamedullary. Juxta-glomerular apparatus. Glomerular membrane. Renal blood flow and its regulation. Functions of kidneys.</li> <li>• Mechanism of Urine Formation</li> <li>• Tubular Reabsorption</li> <li>• Tubular Secretion</li> <li>• Mechanism of concentrating and diluting the Urine</li> <li>• Acid-Base balance (very brief)</li> </ul>	
<b>Unit II: Reproductive system</b>	<b>10 Hours</b>
<ul style="list-style-type: none"> <li>• Introduction: Physiological anatomy reproductive organs</li> <li>• Male Reproductive System</li> <li>• Female Reproductive System</li> <li>• Menstrual Cycle</li> </ul>	
<b>Unit III: Nervous System</b>	<b>12 Hours</b>
<ul style="list-style-type: none"> <li>• Introduction: Organization of CNS – central and peripheral nervous system. Functions of nervous system.</li> <li>• Sensory Mechanism: Sensory receptors: function, classification and properties. Sensory pathway: The ascending/descending tracts</li> <li>• Sensory cortex. Somatic sensations: crude touch, fine touch, tactile localization, tactile discrimination, stereognosis, vibration sense, kinesthetic sensations.</li> <li>• Pain sensation: mechanism of pain.</li> </ul>	



<ul style="list-style-type: none"> <li>• Gate control theory of pain</li> <li>• Reflex Action: components, Bell-Magendie law, classification and Properties. Monosynaptic and polysynaptic reflexes, superficial reflexes, deep reflexes. Stretch reflex– structure of muscle spindle, pathway, higher control and functions. Inverse stretch reflex. Muscle tone – definition, and properties hypotonia, atonia and hypertonia. UMNL and LMNL</li> <li>• Sleep: REM and NREM sleep.</li> <li>• CSF: Formation, composition, circulation and functions. Lumbar puncture and its significance. Blood brain barrier. Hydrocephalus.</li> <li>• ANS: Features and actions of parasympathetic and sympathetic nervous system.</li> </ul>
<p><b>Unit IV: Special Senses</b> <span style="float: right;"><b>10</b></span> <b>Hours:</b></p>
<ul style="list-style-type: none"> <li>• Vision: Introduction: Functional anatomy of eye ball. Functions of cornea, iris, pupil, aqueous humor – glaucoma, lens – cataract, vitreous humor, rods and cones. Photopic vision. Scotopic vision.</li> <li>• Visual Pathway and the effects of lesions.</li> <li>• Visual Reflexes: Accommodation, Pupillary and Light.</li> <li>• Color vision – color blindness. Nyctalopia.</li> <li>• Audition: Physiological anatomy of the ear. Functions of external ear, middle ear and inner ear. Structure of Cochlea and organ of corti. Auditory pathway. Types of Deafness. Tests for hearing. Audiometry.</li> <li>• Taste: Taste buds. Primary tastes. Gustatory pathway.</li> <li>• Smell: Olfactory membrane. Olfactory pathway.</li> <li>• Vestibular Apparatus: Crista ampullaris and macula. Functions. Disorders</li> </ul>
<p><b>Unit V: Physiology of exercises</b> <span style="float: right;"><b>10</b></span> <b>Hours</b></p>
<ul style="list-style-type: none"> <li>• Effects of acute and chronic exercise on             <ol style="list-style-type: none"> <li>i. O<sub>2</sub> transport</li> <li>ii. Muscle strength/power/endurance</li> <li>iii. B.M.R. /R.Q.</li> <li>iv. Hormonal and metabolic effect</li> <li>v. Cardiovascular system</li> <li>vi. Respiratory system</li> <li>vii. Body fluids and electrolyte</li> </ol> </li> </ul>

<ul style="list-style-type: none"> <li>• Effect of gravity / altitude /acceleration / pressure on physical parameters</li> </ul>
<p><b>Unit VI: Applied Physiology</b> <span style="float: right;"><b>8</b></span> <b>hours</b></p>
<ul style="list-style-type: none"> <li>• Artificial Kidney: Principle of hemodialysis.</li> <li>• Micturition and type of incontinence (related articles)</li> <li>• Skin and temperature regulation</li> <li>• Pregnancy tests.</li> <li>• Placenta preservation, function of placenta</li> <li>• EEG: Waves and features</li> </ul>

**Suggested Reading**

3. **Dr. A. K. Jain. Textbook of Physiology (Set of 2 Volumes) 5th Edition, Avichal Publishing Company, ISBN: 9788177393583**
4. **A. K. Jain, Human Physiology & Biochemistry For Physical & Occupational Therapy, A, Avichal Publishing Company, 2006, ISBN: 9788178552743**
5. **A.C.Guyton, J.E. Hall. Textbook of Medical Physiology 11<sup>th</sup> edition, Elsevier Saunders, 2006, ISBN: 9780721602400**
6. **R. L. Bijlani, S. Manjunatha, Understanding Medical Physiology: A textbook for Medical Students 4<sup>th</sup> edition. Jaypee Brothers Medical Publishers (P) Ltd, 2011, ISBN: 978-80704-81-4**

<b>Name of The Course</b>	General and clinical psychology			
<b>Course Code</b>	BPHY2003			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	3	0	0	3

**Course Objectives**

1. Importance of Psychological Status of the Person in Health & Disease, Environmental & Emotional Influence on the Mind & Personality.
2. Acquire Knowledge as to How to Deal with the Patient.
3. Psycho-social Assessment of Patients in Various Developmental Stages.

## Course Outcomes

On course completion the student will be able to

<b>CO1</b>	To demonstrate knowledge of Psychological Maturation during human development, growth & alterations during ageing process.
<b>CO2</b>	To utilize the knowledge to become Perceptive, Socially aware & self-reflective.
<b>CO3</b>	Apply the knowledge to develop Emotional Competencies and understand psychological status of the person in health & disease.
<b>CO4</b>	To utilize the knowledge of Ego-Defence mechanism & learn counselling techniques to help those in need.
<b>CO5</b>	Demonstrate importance of health in the society & rehabilitation methods of patients which is related to the society.
<b>CO6</b>	To discuss psychological disorders

## Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

## Course Content:

UNIT-1. Introduction to Psychology & Growth and Development <b>10 hours</b>
Schools: Structuralism, functionalism, behaviorism, Psychoanalysis. Methods: Introspection, observation, inventory and experimental method. Psychology and physiotherapy Life span: Different stages of development (Infancy, childhood, adolescence, adulthood, middle age, old age). Heredity and environment: role of heredity and environment in physical and Psychological development, "Nature v/s Nurture controversy".
UNIT-II Sensation, attention and perception <b>10 hours</b>

Sensation: Vision, Hearing, Olfactory, Gustatory and Cutaneous sensation, movement, equilibrium and visceral sense. Attention: Types of attention, Determinants of attention (subjective determinants and objective determinants). Perception: Gestalt principles of organization of perception (principle of figure ground and principles of grouping), factors influencing perception (past experience and context). Illusion and hallucination: different types.
UNIT-III. Learning , Thinking, Motivation & Emotion <b>10 hours</b>
Learning:-Factors effecting learning. Theories of learning: trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory. The effective ways to learn: Massed/Spaced, Whole/Part, Recitation/Reading, Serial/Free recall, Incidental/Intentional learning, Knowledge of results, association, organization, and mnemonic methods. Thinking :- Reasoning: deductive and inductive reasoning. Problem solving: rules in problem solving (algorithm and heuristic). Creative thinking: steps in creative thinking, traits of creative people Motivation :- Motivation cycle (need, drive, incentive, reward). Classification of motives. Abraham Maslow's theory of need hierarchy Emotion :-Three levels of analysis of emotion (physiological level, subjective state, and overt behavior). Theories of emotion. Stress and management of stress.
UNIT-IV. Intelligence & Personality- Frustration & Conflicts <b>10 hours</b>
Intelligence :-Theories of intelligence. Distribution of intelligence. Assessment of intelligence. Personality :-Approaches to personality: type & trait, behavioristic, psychoanalytic and humanistic approach. Personality assessment: observation, situational test, questionnaire, rating scale, interview, and projective

techniques. Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjection, acting out.

Frustration & Conflicts :- Frustration: sources of frustration. Conflict: types of conflict. Management of frustration and conflict

UNIT-5. Social & Clinical psychology **10 hours**

Social Psychology:- Leadership: Different types of leaders. Different theoretical approaches to leadership. Attitude: development of attitude. Change of attitude. Clinical psychology :- Models of training, abnormal behavior assessment, clinical judgement, Psychotherapy, self-management methods, physiotherapist patient interaction, aggression, self imaging, stress management, assertive training, Group therapy, Body awareness, Pediatric, child and geriatric clinical psychology.

Unit VI- **Psychological disorders** **10 hours**

- Eating disorders
- Phobias
- Borderline personality disorder
- Seasonal affective disorder

6. Robert A. Baron, Nyla R. Branscombe, Donn Byrne. Social Psychology 12th edition, Allyn & Bacon publishers, 2008, ISBN : 978-0205581498

<b>Name of The Course</b>	BASIC PRINCIPLES OF BIOMECHANICS			
<b>Course Code</b>	BPHY2004			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	3	0	0	3

Course Objectives:

1. To study the basic concepts of human movement, and application of various biomechanical principles in the evaluation and treatment of disorders of musculoskeletal system.
2. Students are taught to understand the various quantitative and qualitative methods of movement. Mechanical principles of various treatment methods are studied.
3. To study posture and gait.

Course Outcomes:

On course completion the student Shall be able to:

CO1	To identify the mechanical principles of muscular and skeletal system reacting to various forces.
CO2	To assess the joint structure and principles of physics in the analysis of joint function and dysfunction
CO3	To assess the muscle structure and connective tissue behaviour in the analysis of muscle function and dysfunction
CO4	To interpret the structure and movement examination of thorax and chest wall in healthy and unhealthy individuals.
CO5	To identify the anatomical, function and dysfunction of Temporomandibular joint
CO6	To Imagine various biomechanical principles in Sports & Corporate.

**Continuous Assessment Pattern**

### Suggested Reading

1. Patricia F. Waller. Introduction to Psychology 4<sup>th</sup> edition, Clifford T. Morgan, Richard A. King , Paul G. Shinkman, McGraw-Hill Book, 1971, ISBN: 978-0-07-043085-3
2. Introduction to social Psychology- Akolkar- Oxford Publishing House.
3. Psychology and Sociology- Applied to Medicine- Porter & Alder- W.B Saunders.
4. Psychology: Six Perspectives, L. Dodge Farnald, SAGE Publications, 2007, ISBN: 978-1412938679
5. J. H. Turner. The Structure of Sociological Theory 1<sup>st</sup> edition, Dorsey publisher, 1974, ASIN: B0039BDDEM

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test(CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
10	20	70	100

Course contents:

Unit-1 Basic Concepts in Biomechanics.	10 lecture hours
Kinematics and Kinetics	
a. Types of Motion	
b. Location of Motion	
c. Direction of Motion	
d. Magnitude of Motion	

Unit-2 Joint structure and Function	<b>10 lecture hours</b>
a. Joint design	
b. Materials used in human joints	
c. General properties of connective tissues	
d. Human joint design	
e. Joint function	
f. Joint motion	
g. General effects of disease, injury and immobilization	
Unit-3 Muscle structure and function	<b>10 lecture hours</b>
a. Mobility and stability functions of muscles	
b. Elements of muscle structure	
c. Muscle function	
d. Effects of immobilization, injury and aging	
Unit-4 Biomechanics of the Thorax and Chest wall	<b>10 lecture hours</b>
a. General structure and function	
b. Rib cage and the muscles associated with the rib cage	
c. Ventilatory motions: its coordination and integration	
d. Developmental aspects of structure and function	
e. Changes in normal structure and function In relation to pregnancy, scoliosis and COPD	
Unit-5 The Temporomandibular Joint-	<b>10 lecture hours</b>
a. General features, structure, function and dysfunction	
Unit -6 Recent advances	<b>10 Lecture hours</b>
Ergonomics	
Biomechanics in Sports	

- e. Definition of Forces
- f. Force of Gravity
- g. Reaction forces
- h. Equilibrium
- i. Objects in Motion
- j. Force of friction
- k. Concurrent force systems
- l. Parallel force system
- m. Work
- n. Moment arm of force
- o. Force components
- p. Equilibrium of levers.

Text Book (s)

- Principles of Exercise Therapy 4th edition, M. Dena Gardiner, CBS Publishers & Distributors Pvt Ltd, 2005, ISBN: 978-8123908939
- Joint Structure and Function: A Comprehensive Analysis 5th edition, Pamela K Levangie, Cynthia C Norkins, F. A. Davis Company, 2010, ISBN: 978-0803623620
- Therapeutic Exercise: Foundations and Techniques 6th edition, Carolyn Kisner, Lynn Allen Colby, F.A. Davis Company, 2012, ISBN: 978-0803625747

Reference Book (s)

- Practical Exercise Therapy, 4th edition, Margaret Hollis & Phyl Fletcher cooks, Wiley, 1999, ISBN: 9780632049738
- Clinical Kinesiology and Anatomy (Clinical Kinesiology for Physical Therapist Assistants), 5<sup>th</sup> edition ; Lynn Lippert, F.A. Davis Company, 2011, ISBN: 978-0-8036-2363-7
- Introduction to Physical Therapy 3rd edition, Michael A. Pagliarulo, Mosby, 2006, ISBN: 978-0323032841

<b>Name of the Course</b>	<b>Medical Terminology and Record Keeping</b>
<b>Course Code</b>	<b>BPHY2005</b>
<b>Prerequisite</b>	
<b>Co-requisite</b>	
<b>Anti-requisite</b>	

	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>

### Course Objectives

- 1.To study the various medical terminology
- 2.To study the basic knowledge of record keeping

### Course Outcomes

<b>CO1</b>	To utilize their knowledge in for maintaining various file according to the medical terminology
<b>CO2</b>	That will help in professional life to maintain the record of various patients according to the disease
<b>CO3</b>	Apply the knowledge of Terminology in different disease suffix, prefix, abbreviations

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
50			50

### Course Content:

<b>Unit I:</b> Introduction and Basic medical terminology <b>10 hours</b>
<ol style="list-style-type: none"> <li>a) Derivation of medical terms.</li> <li>b) Define word roots, prefixes, and suffixes.</li> <li>c) Conventions for combined morphemes and the formation of plurals</li> <li>d) Basic medical terms in health care and physiotherapy.</li> <li>e) Form medical terms utilizing roots, suffixes, prefixes, and combining roots.</li> <li>f) Interpret basic medical abbreviations/symbols.</li> </ol>
<b>Unit II: Procedure and diagnostic terms</b> <b>10 hours</b>
<ol style="list-style-type: none"> <li>a) Utilize diagnostic, surgical, and procedural terms and abbreviations related to the integumentary system, musculoskeletal system, respiratory system, cardiovascular system, nervous system, and endocrine system.</li> <li>b) Interpret medical records/reports. Lab (Pathological, Biochemistry) Radiological</li> </ol>

report (X –Ray, MRI Scan, CT scan, Ultrasound report)
<b>Unit III: Data management</b> <b>10 hours</b>
<b>Data entry and management on electronic health record system. Excel, Word, PDF, ETC.</b>

### Suggested Reading

1. Medical terminology for health professional by Anna Ehrlich ,Carol L,Schroeder,Laura EhrlichKatrina A. Schroeder.ISBN-13: 978-1418072520.ISBN-10: 1418072524
2. Medical terminology by David Anderson,Publisher: Medical Creations; 2 edition (November 14, 2016)
- 3.MEDICAL TERMINOLOGY FOR STUDENTS OF THE HEALTH PROFESSIONS 3/E By Bosman JP, Kritzinger JPK, Meiring JH, Schumann CJ, Abrahams PH, Greyling LMISBN: 9780627035951,publishing 2018.

<b>Name of The Course</b>	<b>Human Anatomy Lab-II</b>
<b>Course Code</b>	<b>BPHY2006</b>
<b>Prerequisite</b>	
<b>Co-requisite</b>	
<b>Anti-requisite</b>	
	<b>L    T    P    C</b>
	<b>0    0    6    3</b>

### Course Objectives

#### The student is expected to study:

1. Understanding of gross anatomy of various body parts.
2. Application of knowledge of anatomy to learn evaluation and application of physical therapy.
3. Major emphasis of learning is towards Musculo-skeletal, upper & lower extremity, head, neck, pelvis and nervous system.

### Course Outcomes



<b>CO1</b>	Illustrate and identify the musculoskeletal anatomy and upper extremity anatomy
<b>CO2</b>	Interpret the anatomy of lower extremity and application of knowledge in patient evaluation and management
<b>CO3</b>	Identify and apply knowledge of trunk and pelvis anatomy in patient evaluation and management
<b>CO4</b>	Illustrate anatomy of head & neck anatomy and apply knowledge in evaluation and management of patient
<b>CO5</b>	Interpret the anatomy of nervous system and application of knowledge in patient evaluation and management
<b>CO6</b>	Interpret the surface markings.

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

### Course Content:

List of Practical	90 hours
1.To Study the bones of Shoulder Girdle & its muscle attachment. 2.To Study the bones of Forearm & its muscle attachment. 3.To Study the bones of wrist & its muscle attachment. 4.To Study the bones of pelvic Girdle & its muscle attachment. 5.To Study the bones of leg & its muscle attachment. 6.To Study the bones of Foot & its muscle attachment. 7.To Study the bones of skull & muscle of the face. 8.To Study the structures of central nervous system & peripheral nervous system. 9.To study the anatomy of cranial nerves. 10.To study the anatomy of spinal cord-ascending & descending tracts. 11.To study the surface markings of upper limb 12. To study the surface markings of lower limb	

### Suggested Reading

1. B.D. Chaurasia's Handbook of General Anatomy 4<sup>th</sup> edition, CBS Publishers & distributors, 2013, ISBN: 978-8123916545
2. B.D. Chaurasia's Human Anatomy: Regional & Applied dissection and Clinical Upper limb & Thorax (volume-1) 4<sup>th</sup> edition, CBS Publishers & distributors, 2004, ISBN: 81-239-1155-6
3. B.D. Chaurasia's Human Anatomy: Regional & Applied dissection and Clinical Lower limb Abdomen and Pelvis (volume-2) 4<sup>th</sup> edition, CBS Publishers & distributors, 2004, ISBN: 81-239-1156-4
4. H.McMinn, John Pegington, Peter H. Abrahams. A Color Atlas of Human Anatomy 3<sup>rd</sup> edition, M, Mosby, 1996, ISBN: 978-0815158585
5. Richard S. Snell. Clinical Anatomy for Medical Students 6<sup>th</sup> edition, Lippincott Williams & Wilkins, 2000, ISBN: 9780781715744
6. Derek Field. Field's Anatomy, Palpation and Surface Marking 4<sup>th</sup> edition, Butterworth-Heinemann Ltd, 2006, ISBN : 978-0750688482

Name of The Course	Human Physiology-II (Lab)			
Course Code	BPTHY2007			
Prerequisite				
Co-requisite				
Anti-requisite				
	L	T	P	C
	0	0	3	1.5

### Course Objectives

- 1.The physiological functions of the systems of Human body with special emphasis on renal system, reproductive system, nervous system, special senses and physiological effects of exercise
- 2.The physiological principles in the practice of physical therapy.

### Course Outcomes

<b>CO1</b>	Utilize their knowledge for identification of various pathological events that are leading to the disease process.
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CO2	Apply the knowledge to identify various abnormalities in cardiovascular, respiratory and nervous system.
CO3	Demonstrate the examination of various physiological processes.

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

### Course Content:

<b>Practical 1</b>	Examination of Radial pulse and Recording of blood pressure
<b>Practical 2</b>	Examination of CVS
<b>Practical 3</b>	Examination of Respiratory system and Artificial Respiration Demonstrations
<b>Practical 4</b>	Examination of Sensory and motor system
<b>Practical 5</b>	Examination of reflexes
<b>Practical 6</b>	Examination of cranial nerves
<b>Practical 7</b>	Normal cardiogram of amphibian heart.
<b>Practical 8</b>	Properties of Cardiac muscle, ECG Demonstrations
<b>Practical 9</b>	Effect of temperature on cardiogram.
<b>Practical 10</b>	Spirometry Demonstrations

### Suggested Reading

7. Dr. A. K. Jain. Textbook of Physiology (Set of 2 Volumes) 5th Edition, Avichal Publishing Company, ISBN: 9788177393583
8. A. K. Jain, Human Physiology & Biochemistry For Physical & Occupational Therapy, A, Avichal Publishing Company, 2006, ISBN: 9788178552743
9. A.C.Guyton, J.E. Hall. Textbook of Medical Physiology 11<sup>th</sup> edition, Elsevier Saunders, 2006, ISBN: 9780721602400
10. R. L. Bijlani, S. Manjunatha, Understanding Medical Physiology: A textbook for Medical Students 4<sup>th</sup> edition. Jaypee Brothers Medical Publishers (P) Ltd, 2011, ISBN: 978-80704-81-4

<b>Name of The Course</b>	<b>Basic principles of biomechanics (practical)</b>			
<b>Course Code</b>	<b>BPHY2009</b>			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	0	0	2	1

### Course Objectives

- 1.To understand the basic principles of biomechanics.
- 2.Describe the relation between the movement and force system on the anatomical structure of body.
- 3.To relate the changes of force because of the mobility and stability of normal and abnormal structures.

### Course Outcomes

On course completion the student will be able to

<b>CO1</b>	To demonstrate the change of normal structure and function in relation to the change of forces.
<b>CO2</b>	To assess the joint structure and principles of physics in the analysis of joint function and dysfunction.

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
30		70	100

### Course Content:

**15 hours**

List of Practical
<ol style="list-style-type: none"> <li>1. To demonstrate body levers.</li> <li>2. To Study different force systems(GRF, moment arm) in various instruments(shoulder wheel, shoulder ladder, balancing board etc).</li> <li>3. To study different types of pulley's &amp; anatomical pulley's.</li> <li>4. To study basic Human joint design.(concavo-convex rule).</li> <li>5. To study different joints with relation to design, axis/planes of motion &amp; ROM.</li> </ol>

6. To study general structure, types of muscles & their functions.
7. To Study biomechanical properties of muscles.(extensibility, strength, endurance etc).
8. To study biomechanical properties of muscle in special cases(aged, diseased, disorder, contractures etc)
9. To Study Biomechanics of thoracic cage & breathing pattern. (bucket handle, pump handle)
10. To study biomechanics of abnormal breathing pattern.(pregnancy, scoliosis, COPD etc).

### Suggested Reading

- Principles of Exercise Therapy 4<sup>th</sup> edition, M. Dena Gardiner, CBS Publishers & Distributors Pvt Ltd, 2005, ISBN: 978-8123908939
- Joint Structure and Function: A Comprehensive Analysis 5<sup>th</sup> edition, Pamela K Levangie, Cynthia C Norkins, F. A. Davis Company, 2010, ISBN: 978-0803623620
- Therapeutic Exercise: Foundations and Techniques 6<sup>th</sup> edition, Carolyn Kisner, Lynn Allen Colby, F.A. Davis Company, 2012, ISBN: 978-0803625747
- Carol A. Oatis. Kinesiology: The Mechanics and Pathomechanics of Human Movement 2nd edition, Lippincott Williams & Wilkins, 2008, ISBN: 978-0781774222

### Reference Book (s)

- Practical Exercise Therapy, 4th edition, Margaret Hollis & Phyl Fletcher cooks, Wiley, 1999, ISBN: 9780632049738
- Clinical Kinesiology and Anatomy (Clinical Kinesiology for Physical Therapist Assistants), 5th edition ; Lynn Lippert, F.A. Davis Company, 2011, ISBN: 978-0-8036-2363-7
- Introduction to Physical Therapy 3rd edition, Michael A. Pagliarulo, Mosby, 2006, ISBN: 978-0323032841

<b>Name of The Course</b>	<b>Clinical observation including clinical psychology</b>
<b>Course Code</b>	<b>BPHP2010</b>
<b>Prerequisite</b>	
<b>Corequisite</b>	
<b>Antirequisite</b>	
	<b>L T P C</b>

	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>
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### Course Objectives

1. To sensitize potential learners with essential knowledge, this will lay a sound foundation for their learning across the under-graduate program and across their career
2. To ensure the attention of a student and make them more receptive such as group activities, interactive fora, role plays, and clinical bed-side demonstrations.

### Course Outcomes

<b>CO1</b>	<b>Understanding of basic clinical psychology of patient</b>
<b>CO2</b>	<b>Understanding the bedside assessment of a patient or to the course of the disease</b>
<b>CO3</b>	<b>Understanding of different departments in a hospital</b>
<b>CO4</b>	<b>Understanding basic knowledge of modality and its implementation</b>
<b>CO5</b>	<b>Understanding basic knowledge of exercise therapy and its implementation</b>

### Continuous Assessment Pattern

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test(CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
<b>30</b>	<b>00</b>	<b>70</b>	<b>100</b>

### Course Contents:

<b>Unit-1</b>
Basic principles of application of physical therapy in Psychotic Disorders, Tests of Intelligence, Personality test, Problem solving ability. The community orientation and clinical visit will include visit to the entire chain of healthcare delivery system -Sub center, PHC, CHC, SDH, DH and Medical college, private hospitals, dispensaries and clinics.
<b>Unit-2</b>
The student will also be briefed regarding information about a patient's clinical status



including signs, symptoms, and course of a disease
<b>Unit-3</b>
Clinical visit to their respective professional department within the hospital.
<b>Unit-4</b>
The students will learn about the construction and principle of working of various electrotherapeutic modalities and will be explained the indications, contraindications and harmful effects of the same. They will be taught to perform a check for all modalities. This will enable the students to apply these modalities for therapeutic purpose efficiently.
<b>Unit-5</b>
Develop the skills of the students in areas like assessment of physical parameters (joint range of motion, muscle strength etc.) and principles of exercise therapy (strengthening, stretching, goniometry etc.) and its application.
<b>Hands on practice</b>
<ul style="list-style-type: none"> <li>• Mobilization Mulligan technique</li>   <li>• <b>Topic presentation on patient psychology</b></li> <li>• Case presentation</li> </ul>

<b>Course Code</b>	BPHY3001			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	3	0	0	3

### Course Objectives

1. The deviations in the structure and functions of tissues and body organs when diseased
2. Describe the classification and characteristics of disease producing micro-organisms
3. Explain the various types of immunity

### Course Outcomes

CO1	To demonstrate an understanding of the inflammation in human body and the immune system and its related pathologies.
CO2	To demonstrate the structure of musculoskeletal system, Alimentary tract and Endocrine system in human body and the related pathologies
CO3	To show how cardio-respiratory, hepato-biliary and lymphatic system is employed in the human body the function it carries and the pathologies related to it
CO4	To utilize the basic principles of central nervous system in the human body, how it functions and the applied pathology it suffers from
CO5	To demonstrate the various types of cancers and its pathology
CO6	To illustrate type of corona virus and pathology

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

### Course Content:

<b>Unit I: Cell injuries, Inflammation and Repair, Immunopathology and Infectious diseases</b>
Introduction to Pathology
Cell injuries –
a. Aetiology and Pathogenesis with a brief recall

### Suggested Reading

#### Text Book (s):

- Textbook of rehabilitation by S. Sunders

Tidy's Physiotherapy, 12th edition, Ann M. Thomson, Alison T. Skinner, Joan

<b>Name of The Course</b>	<b>PATHOLOGY</b>
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of important aspects of normal cell structure.

Reversible cell injury: Types, Sequential changes, Cellular swellings, vacuolation, Hyaline changes, Mucoïd changes.

Irreversible cell injury: Types of Necrosis & Gangrene, Autolysis. Pathologic calcification:

Dystrophic and Metastatic. Intracellular Accumulations - Fatty changes, Protein accumulations, Glycogen accumulations,

b. Pigments - Melanin / Hemosiderin.

c. Extra cellular accumulations: Amyloidosis - Classification, Pathogenesis, Pathology including special stains.

Inflammation and Repair –

a. Acute inflammation: features, causes, vascular and cellular events.

b. Inflammatory cells and Mediators. Chronic inflammation: Causes, Types, Classification nonspecific and granulomatous with examples.

c. Repair, Wound healing by primary and secondary union, factors promoting and delaying the process.

d. Healing in specific site including bone healing.

Immunopathology –

a. Immune system: General concepts.

b. Hypersensitivity: type and examples, antibody and cell mediated tissue injury with examples. . Secondary immunodeficiency including HIV infection. Auto-immune disorders: Basic concepts and classification, SLE.

c. AIDS-Aetiology, Modes of transmission, Diagnostic procedures, handling of infected material and health education.

Infectious diseases –

a. Mycobacterial diseases: Tuberculosis, Leprosy and Syphilis.

b. Bacterial disease: Pyogenic, Diphtheria, Gram negative infection, Bacillary dysentery.

c. Viral diseases: Poliomyelitis, Herpes, Rabies,

Measles, Ricktsia, Chlamydial infection, HIV infection.

d. Fungal disease and opportunistic infections.

Parasitic diseases: Malaria, Filaria, Amoebiasis, Kala-azar, Cysticercosis, Hydatid cyst

Unit II: Unit-2: Circulatory Disturbances, Growth Disturbances and Neoplasia, Nutritional Disorders, and Genetic Disorders

Circulatory Disturbances –

1. Hyperemia/Ischemia and Haemorrhage  
Edema: Pathogenesis and types. Chronic venous congestion: Lung, Liver, Spleen, Systemic Pathology Thrombosis and Embolism: Formation, Fate and Effects.
2. Infarction: Types, Common sites.
3. Shock: Pathogenesis, types, morphologic changes.

Growth Disturbances and Neoplasia

- a. Atrophy, Hypertrophy, Hyperplasia, Aplasia, Hypoplasia, Metaplasia, Malformation, agenesis, dysplasia.
- b. Precancerous lesions.
- c. Neoplasia: Definition, classification, Biological behaviour : Benign and Malignant, Carcinoma and Sarcoma.
- d. Malignant Neoplasia: Grades and Stages, Local & Distant spread.
- e. Carcinogenesis: Environmental carcinogens, chemical, viral, occupational. Heredity and cellular oncogenes and prevention of cancer.
- f. Benign & Malignant epithelial tumours Eg. Squamous papilloma, Squamous cell carcinoma, Malignant melanoma. Benign & Malignant mesenchymal tumours Eg: Fibroma, Lipoma, Neurofibroma, Fibrosarcoma, Liposarcoma, Rhabdomyosarcoma, Teratoma.

Nutritional Disorders –

- a. Protein energy malnutrition: Marasmus, Kwashiorkor, and Vitamin deficiency disorders, classification with specific examples.

Genetic Disorders – Basic concepts of genetic disorders and some common examples and congenital malformation
Unit III: Unit-3: Hepato-biliary, Cardiovascular, Respiratory system and Endocrine pathology
<p>Hepato – biliary pathology.</p> <ol style="list-style-type: none"> <li>Jaundice: Types, aetio-pathogenesis and diagnosis. Hepatitis: Acute, Chronic, neonatal.</li> <li>Alcoholic liver disease</li> <li>Cirrhosis: Post necrotic, Alcoholic, Metabolic and Portal hypertension Liver abscesses; Pyogenic, parasitic and Amoebic. Tumours of Liver</li> </ol> <p>Cardiovascular Pathology</p> <ol style="list-style-type: none"> <li>Congenital Heart disease: Atrial septal defect, Ventricular septal defect, Fallot's tetralogy, Patent ductus arteriosus.</li> <li>Endocarditis. Rheumatic Heart disease.</li> <li>Vascular diseases: Atherosclerosis, Monckeberg's medial calcification, Aneurysm and Arteritis and tumours of Blood vessels.</li> <li>Ischemic heart Disease: Myocardial infarction. Hypertension and hypertensive heart Disease.</li> </ol> <p>Respiratory system:</p> <ol style="list-style-type: none"> <li>Pneumonia, Bronchitis, Bronchiectasis, Asthma, Tuberculosis, Carcinoma of lungs, Occupational lung diseases.</li> </ol> <p>Endocrine pathology:</p> <ol style="list-style-type: none"> <li>Diabetes Mellitus: Types, Pathogenesis, Pathology, Laboratory diagnosis Non-neoplastic lesions of Thyroid: Iodine deficiency goitre, autoimmune Thyroiditis, Thyrotoxicosis, myxoedema, Hashimoto's thyroiditis.</li> </ol> <p>Tumours of Thyroid: Adenoma, Carcinoma: Papillary, Follicular, Medullary, Anaplastic. Adrenal diseases:</p>

cortical hyperplasia, atrophy, tuberculosis, tumours of cortex and medulla
Unit IV: Unit IV: Neuropathology, Haematology and Musculoskeletal System
<p>Neuropathology</p> <ol style="list-style-type: none"> <li>Inflammations and Infections: TB Meningitis, Pyogenic Meningitis, viral meningitis and Brain Abscess</li> <li>Tuberculosis, Cysticercosis</li> <li>CNS Tumors, Astrocytoma, Neuroblastoma, Meningioma, Medulloblastoma</li> </ol> <p>Haematology –</p> <ol style="list-style-type: none"> <li>Constituents of blood and bone marrow, Regulation of haematopoiesis. Anaemia: Classification, clinical features &amp; lab diagnosis.</li> <li>Nutritional anaemias: Iron deficiency anaemia, Folic acid, Vit. B 12 deficiency anaemia including pernicious anaemia. Haemolytic Anaemias: Classification and Investigations. Hereditary haemolytic anaemias: Thalassemia, Sickle cell anaemia, Spherocytosis and Enzyme deficiencies.</li> <li>Acquired haemolytic anaemias <ol style="list-style-type: none"> <li>Alloimmune, Autoimmune</li> <li>Drug induced, Microangiopathic Pancytopenia - Aplastic anaemia.</li> </ol> </li> <li>Haemostatic disorders, Vascular and Platelet disorders &amp; lab diagnosis. Coagulopathies – <ol style="list-style-type: none"> <li>Inherited</li> <li>Acquired with lab diagnosis.</li> </ol> </li> <li>Leukocytic disorders: Leucocytosis, Leukopenia, Leukemoid reaction.</li> <li>Leukaemia: Classification, clinical manifestation, pathology and Diagnosis. Multiple myeloma and dysproteinaemias.</li> <li>Blood transfusion; Grouping and cross matching, untoward reactions, transmissible infections including HIV &amp; hepatitis, Blood-components &amp; plasma-pheresis.</li> </ol> <p>Musculoskeletal System</p> <ol style="list-style-type: none"> <li>Osteomyelitis, acute, chronic, tuberculous, mycetoma</li> <li>Metabolic diseases: Rickets/Osteomalacia, osteoporosis, Hyperparathyroidism, Paget's disease.</li> <li>Tumours Classification: Benign, Malignant, Metastatic and synovial sarcoma. Arthritis: Suppurative, Rheumatoid. Osteoarthritis, Gout, Tuberculous</li> </ol>

**Unit V:Unit-5: Dermatopathology and Lymphatic System, and Alimentary tract pathology**

**Dermatopathology**

a. Skin tumors: Squamous cell carcinoma, Basal cell carcinoma, Melanoma

**Lymphatic System**

Diseases of the gall bladder: Cholecystitis, Cholelithiasis, Carcinoma. Lymphadenitis - Nonspecific and granulomatous. Causes of Lymph Node enlargements. Reactive Hyperplasia, Primary Tumours - Hodgkin's and Non-Hodgkin's Lymphomas, Metastatic Tumours.

Causes of Splenic Enlargements.

**Alimentary tract:**

Oral Pathology: Ulcers, leucoplakia, Carcinoma, oral cavity diseases and tumour of salivary gland & oesophagus and precancerous lesions, Oesophagus inflammatory, functional disorders and tumours.

Stomach: Gastritis, Ulcer & Tumours.

Tumours and tumour like condition of the small and large Intestine: Polyps, carcinoid, carcinoma, Lymphoma

**Unit VI: Pathology of corona**

a. Etiologic and pathogenesis of COVID-19

b. Path-physiology of COVID-19

3 0 0 3

**Course Objectives**

1. To demonstrate an understanding of the general microbiology.
2. To demonstrate an understanding of the immune system and its role & pathogenesis.
3. To demonstrate the understanding of bacteriology in the human body and its pathogenesis.

**Course Outcomes**

CO1	To demonstrate an understanding of the general microbiology.
CO2	To demonstrate an understanding of the immune system and its role & pathogenesis.
CO3	To demonstrate the understanding of bacteriology in the human body and its pathogenesis.
CO4	To utilize the basic principles of mycology and virology.
CO5	To understand the clinical microbiology.
CO6	To create latest trends in microbiology

**Continuous Assessment Pattern**

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

**Course Content:**

Unit I: Introduction	8 Hours
<ul style="list-style-type: none"> <li>• Definitions: infections, parasite, host, vector, fomite, contagious disease, infectious disease, epidemic, endemic, pandemic, Zoonosis, Epizootic, Attack rate.</li> <li>• Normal flora of the human body.</li> <li>• Routes of infection and spread; endogenous and exogenous infections; source at reservoir of infections.</li> <li>• Bacterial cell. Morphology limited to recognizing bacteria in clinical samples Shape, motility and arrangement. Structures, which are virulence, associated.</li> </ul>	

**Suggested Reading:**

1. HarshMohan.TextbookofPathology 5th edition, Anshan Publishers, 2005, ISBN : 978-1904798194
2. R. Ananthanarayan, C.K. Panikar. Text Book of Microbiology, Orient Blackswan, 2005, ISBN: 9788125028086
3. Vinay Kumar, Abul K. Abbas, Jon C. Aster. Robbin's Basic Pathology 9th edition, Saunders, 2012, ISBN: 978-1437717815
4. Prescott's Microbiology 8th edition, Joanne M.Willey, Linda M. Sherwood, Christopher J. Woolverton, McGraw-Hill, 2010, ISBN: 978-0077402563

<b>Name of The Course</b>	BPHY3002
<b>Course Code</b>	Microbiology
<b>Prerequisite</b>	
<b>Co-requisite</b>	
<b>Anti-requisite</b>	
	L T P C

<ul style="list-style-type: none"> <li>• Physiology: Essentials of bacterial growth requirements.</li> <li>• Sterilization, disinfection and universal precautions in relation to patient care and disease prevention. Definition of asepsis, sterilization, disinfection.</li> <li>• Antimicrobials: Mode of action, interpretation of susceptibility tests, resistance spectrum of activity.</li> </ul>
<b>Unit II: Immunology</b> <b>9</b>
<b>Hours</b>
<p><b>a) Basic principles of immunity immunobiology</b></p> <ul style="list-style-type: none"> <li>• Lymphoid organs and tissues.</li> <li>• Antigen, Antibodies, antigen and antibody reactions.</li> </ul> <p><b>b) Immunity</b></p> <ul style="list-style-type: none"> <li>• Humoral immunity and its role in immunity.</li> <li>• Cell mediated immunity and its role in immunity.</li> <li>• Immunology of hypersensitivity.</li> <li>• Measuring immune functions.</li> </ul>
<b>Unit III: Bacteriology</b> <b>10</b>
<b>Hours</b>
<p><b>a) Introduction</b></p> <ul style="list-style-type: none"> <li>• Morphology, classification according to pathogenicity, mode of transmission, methods of prevention, collection and transport of samples for laboratory diagnosis, interpretation of laboratory reports.</li> </ul> <p><b>b) Staphylococci, Streptococci and Pneumococci.</b></p> <p><b>c) Mycobacteria</b></p> <ul style="list-style-type: none"> <li>• Tuberculosis, M.leprae, atypical mycobacteria, Enterobacteriaceae,</li> </ul> <p><b>d) Vibrios</b></p> <ul style="list-style-type: none"> <li>• V. cholerae and other medically important vibrio's, Campylobacters and Helicobacters, Pseudomonas.</li> </ul> <p><b>e) Bacillus anthracis, Sporing and non-sporing anaerobes</b></p> <ul style="list-style-type: none"> <li>• Clostridia, Bacteroides and Fusobacteria.</li> </ul>

<b>Unit IV: Virology &amp; Mycology</b> <b>10</b>
<b>Hours</b>
<p><b>a) General Virology</b></p> <ul style="list-style-type: none"> <li>• General properties: Basic structure and broad classification of viruses.</li> <li>• Pathogenesis and pathology of viral infections.</li> <li>• Immunity and prophylaxis of viral diseases.</li> <li>• Principles of laboratory diagnosis of viral diseases.</li> <li>• List of commonly used antiviral agents.</li> </ul> <p><b>b) Mycology</b></p> <ul style="list-style-type: none"> <li>• General properties of fungi.</li> <li>• Classification based on disease: superficial, subcutaneous, deep mycoses opportunistic infections including Mycotoxins, systemic mycoses.</li> <li>• General principles of fungal diagnosis, Rapid diagnosis.</li> <li>• Method of collection of samples.</li> <li>• Antifungal agents.</li> </ul>
<b>Unit V: Applied Microbiology</b> <b>8</b>
<b>Hours</b>
<ul style="list-style-type: none"> <li>• Streptococcal infections: Rheumatic fever and Rheumatic heart disease, Meningitis.</li> <li>• Tuberculosis</li> <li>• Pyrexia of unknown origin, leprosy</li> <li>• Sexually transmitted diseases, Poliomyelitis</li> <li>• Hepatitis</li> <li>• Acute-respiratory infections, Central nervous System infections, Urinary tract infections.</li> <li>• Pelvic inflammatory disease, Wound infection, Opportunistic infections, HIV infection.</li> <li>• Malaria, Filariasis, Zoonotic diseases.</li> </ul>
<b>Unit VI: Medical microbiology</b>
<ul style="list-style-type: none"> <li>• Microbial Cosmetics</li> <li>• Microbial detection in Cosmetics</li> <li>• Microbial products</li> <li>• Nanotechnology methods for microbial detection</li> </ul>

**Suggested Reading**

1. R. Ananthanarayan, C.K. Panikar. Text Book of Microbiology, Orient Blackswan, 2005, ISBN: 9788125028086

2. Prescott's Microbiology 8<sup>th</sup> edition, Joanne M. Willey, Linda M. Sherwood, Christopher J. Woolverton, McGraw-Hill, 2010, ISBN: 978-0077402563

3. Dr. D. R. Arora. Textbook of Microbiology 2<sup>nd</sup> edition, CBS Publishers, 2003, ISBN: 9788123909233

Name of The Course	Pharmacology			
Course Code	BPHY3003			
Prerequisite				
Co-requisite				
Anti-requisite				
	L	T	P	C
	3	0	0	3

### Course Objectives

#### The student is expected to study:

1. To study understand pharmaco-kinetics, pharmacodynamics.
2. To be Oriented in the usage of common drugs with (indications, contraindications, side effects)
3. Identify the drug actions that may affect the physical therapy treatment.

### Course Outcomes

CO1	To demonstrate & understand the mechanism of actions of various drugs in general
CO2	To identify the effect of drugs that may alter or enhance the physical therapy treatment and thus modify the treatment accordingly.
CO3	Apply the knowledge of drug with the various systems of human body and with physical therapy treatment, eg pain management, Arthritis, post-surgery.
CO4	To utilize the knowledge of pharmacodynamics anatomy and physiology to understand the drug action on the human body in the management of pain, infection, hypertension, thyroids etc.

CO5	Demonstrate application of various drug & physiotherapy in general rehabilitation process in various medical condition
CO6	To adapt current trends in pharmacology

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

### Course Content:

#### Unit I:

#### General Pharmacology 8 Hours

- ❖ Introduction, Definitions, Classification of drugs, Sources of drugs, Routes of drug administration, Distribution of drugs, Metabolism and Excretion of drugs Pharmacokinetics, Pharmacodynamics, Factors modifying drug response, Adverse effects.
- ❖ **Autonomic Nervous system** – General considerations – The Sympathetic and Parasympathetic Systems, Receptors, Somatic Nervous System
- ❖ Cholinergic and Anti-Cholinergic drugs, Adrenergic and Adrenergic blocking drugs, Peripheral muscle relaxants.

#### Unit II: Cardiovascular Pharmacology 8 hours

- ❖ Drugs used in the treatment of heart failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors Antihypertensive Drugs: Diuretics, Beta Blockers, Calcium Channel Blockers, ACE Inhibitors, Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct acting Vasodilators
- ❖ Antiarrhythmic Drugs
- ❖ Drugs used in the treatment of vascular disease and tissue ischemia: Vascular Disease, Hemostasis Lipid-Lowering agents, Antithrombotic, Anticoagulants and Thrombolytics Ischemic Heart Disease – Nitrates, Beta-Blockers, Calcium Channel Blockers, Cerebral Ischemia Peripheral Vascular Disease.



**Unit III: Neuropharmacology, Disorder of movement, inflammatory and immune diseases**  
8 hours

**Neuropharmacology**

- ❖ Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines
- ❖ Antianxiety Drugs: Benzodiazepines, Other Anxiolytics
- ❖ Drugs Used in Treatment of Mood Disorders: Monoamine Oxidase Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants, Lithium
- ❖ Antipsychotic drugs

**Disorders of Movement –**

- ❖ Drugs used in Treatment of Parkinson's disease
- ❖ Antiepileptic Drugs
- ❖ Spasticity and Skeletal Muscle Relaxants

**Inflammatory/Immune Diseases -**

- ❖ Non-narcotic Analgesics and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs, Aspirin, Nonaspirin NSAIDs, drug Interacts with NSAIDs
- ❖ Glucocorticoids: Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use of Glucocorticoids
- ❖ Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis, Gout
- ❖ Drugs Used in the Treatment of Neuromuscular Immune/Inflammatory Diseases: Myasthenia gravis, Idiopathic Inflammatory Myopathies, systemic lupus Erythematosus, Scleroderma, Demyelinating Disease
- ❖ Respiratory Pharmacology: Obstructive Airway Diseases, Drugs used in Treatment of Obstructive Airway Diseases, Allergic Rhinitis

**Unit IV: Digestion and Metabolism** 5 hours

- ❖ Gastrointestinal Pharmacology: Peptic Ulcer Disease, Constipation, Diarrhea Drugs Used in Treatment of Diabetes Mellitus: Insulin, Oral Hypoglycaemic.

**Unit-V: Geriatrics** 6 hours

- ❖ Pharmacology and the geriatric Population: Adverse effects of special concern in the Elderly, Dementia, Postural hypotension.

**Unit VI: Latest trends** 8 hours

- Recent toxicological studies
- Pharmacoepidemiology and drug safety
- Clinical Pharmacology
- Pharmacogenetics and pharmacogenomics

**Suggested Reading**

1. K.D. Tripathi. Essentials of Medical Pharmacology 6<sup>th</sup> edition, Jaypee Brothers Medical Publishers, 2008, ISBN: 9788184480856
2. Gaddum's Pharmacology 8<sup>th</sup> edition, John H. Gaddum, Oxford University Press, 2008, ISBN: 9780192613073
3. Nirmala N. Rege, R.S. Satoskar, S.D. Bhandarkar. Pharmacology & Pharmacotherapeutics Revised 19<sup>th</sup> Edition, Popular Prakashan (P) Ltd., 2006, ISBN: 9788179912515
4. Laurence Brunton, Bruce Chabner, Bjorn C. Knollmann. Goodman and Gilman's The Pharmacological Basis of Therapeutics, 12<sup>th</sup> edition, McGraw-Hill Professional, 2010, ISBN: 978-0071

<b>Name of The Course</b>	Biomechanics and Kinesiology			
<b>Course Code</b>	BPHY 3004			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	5	0	0	5

**Course Objectives**

Students must study and learn to correlate: -

1. Muscle, Joint structure and function
2. Joint complexes of upper-lower limb and spine.
3. Kinematics

### Course Outcomes

<b>CO1</b>	To demonstrate & Biomechanics of the Vertebral column muscles & joint clinically.
<b>CO2</b>	To Analyse the biomechanics of the shoulder, elbow & wrist complex in a clinical setting.
<b>CO3</b>	To Analyse the biomechanics of the hip, knee & ankle joint complex in a clinical setting.
<b>CO4</b>	To analyse the posture & gait of the vertebral column complex clinically
<b>CO5</b>	To kinematics and kinetics of the trunk and upper extremities in relation to gait
<b>CO6</b>	To gain the knowledge of kinematics and kinesiology

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

### Course Content:

<b>Unit I: Biomechanics of the vertebral column</b>	<b>12 Hours</b>
<ul style="list-style-type: none"> <li>• General structure and functions</li> <li>• Regional structure and function – Cervical region, thoracic region, lumbar region, sacral region</li> <li>• Muscles of the vertebral column</li> <li>• General effects of injury and aging.</li> </ul>	
<b>Unit II: Upper Limb</b>	<b>12 Hours</b>
<ul style="list-style-type: none"> <li>• Shoulder complex structure and components of the shoulder complex and their integrated function</li> <li>• Elbow complex - Structure and function of the elbow joint – humero-ulnar and radioulnar joint articulation, superior and inferior of radioulnar joint, mobility and stability of the elbow</li> </ul>	

complex; the effects of immobilization and injury.

- Wrist joint- The wrist and hand complex: Structural components and functions of the wrist complex; structure of the hand complex; functional position of the wrist and hand.
- Muscles and ligaments of upper joint.

### Unit III: Biomechanics of the hip, Knee, Ankle joint its stability

**12 Hours**

- The hip complex: structure and function of the hip joint; hip joint pathology- arthrosis, fracture, bony abnormalities of the femur
- The knee complex: structure and function of the knee joint – tibiofemoral joint and patellofemoral joint; effects of injury and disease.
- The ankle and foot complex.: structure and function of the ankle joint, subtalar joint, talocalcaneo navicular joint, transverse tarsal joint, tarso metatarsal joints, metatarsophalangeal joints, interphalangeal joints, structure and function of the plantar arches, muscles of the ankle and foot, deviations from normal structure and function – Pes Planus and Pes Cavus

### Unit IV: Analysis of posture and gait

**12 Hours**

- Analysis of Posture and Gait – Static and dynamic posture, postural control, kinetics and kinematics of posture,
- Ideal posture analysis of posture, effects of posture on age, pregnancy, occupation and recreation; occupation and recreation.
- general features of gait, gait initiation, kinematics and kinetics of gait, energy requirements

### Unit V: Kinematics & Kinetics

**12 Hours**

- Kinematics and kinetics of the trunk and upper extremities in relation to gait.
- Stair case climbing and running, effects of age, gender, assistive devices, disease, muscle weakness, paralysis, asymmetries of the lower extremities.
- Injuries and mal alignments in gait.



<ul style="list-style-type: none"> <li>• Movement Analysis : ADL activities like sitting – to standing, lifting, various grips, pinches</li> </ul>
<b>Unit VI: Muscle Action in Sport and Exercise - Biomechanical view</b> <span style="float: right;"><b>8 Hours</b></span>
<ul style="list-style-type: none"> <li>• Neural Contributions to Changes in Muscle Strength - Mechanical Properties and Performance in Skeletal Muscles - Muscle-Tendon Architecture and Athletic Performance.</li> <li>• Eccentric Muscle Action in Sport and Exercise - Stretch–Shortening Cycle of Muscle Function - Biomechanical Foundations of Strength and Power Training</li> </ul>

1. Pamela K. Levangie, Cynthia C. Norkin. **Joint structure & function: A Comprehensive Analysis 5<sup>th</sup> edition**, F. A. Davis Company, 2010, ISBN: 978-0803623620

2. Laura Smith, Elizabeth Weiss, Don Lehmkuhl. **Brunnstrom’s Clinical Kinesiology 5<sup>th</sup> edition**, F.A. Davis Company, 1996, ISBN: 978-0803679160

3. Carol A. Oatis. **Kinesiology: The Mechanics and Pathomechanics of Human Movement 2nd edition**, Lippincott Williams & Wilkins, 2008, ISBN: 978-0781774222

4. Freddy M Kaltenborn, Eileen Vollowitz. **Manual Mobilization of the Joints - The Extremities 7th edition**, Orthopedic Physical Therapy Products, 2011, ISBN: 978-82705

**Suggested Reading**

<b>Name of The Course</b>	<b>Foundation of Exercise Therapy and therapeutic massage</b>			
<b>Course Code</b>	BPHY3005			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	3	0	0	3

**Continuous Assessment Pattern**

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

**Course Objectives**

**The student is expected to study:**

1. Various methods of assessment of the physical parameters like joint ROM, muscle strength etc
2. The principles of exercise therapy e.g., relaxation, stretching, resisted exercises, massage.

**Course Outcomes**

<b>CO1</b>	Assess the Principle of Exercise therapy
<b>CO2</b>	Asses a patient applying the techniques of measuring range of motion for a joint, tests for neuromuscular efficiency, techniques of MMT
<b>CO3</b>	To interpret the principles of relaxation training used for rehabilitation
<b>CO4</b>	To illustrate the principles of types of resisted exercises for assessment
<b>CO5</b>	To illustrate the principles of massage therapy
<b>CO6</b>	To design latest trends in the field of exercise

**Course Content:**

<b>Unit-I: Introduction to Exercise Therapy</b>	<b>12 hours</b>
<ol style="list-style-type: none"> <li>1. Aim of exercise therapy</li> <li>2. Techniques of exercise therapy</li> <li>3. Approach to patient’s problem</li> <li>4. Assessment of patient’s condition- measurement of vital parameters,</li> <li>5. Starting position - fundamental and derived position, planning of treatment.</li> </ol>	
<b>Unit-II Methods of Testing</b>	<b>12 hours</b>
<ol style="list-style-type: none"> <li>a). Functional tests</li> <li>b). Measurement of Joint range: ROM-Definition, Normal ROM for all peripheral joints &amp; spine, Goniometer-parts, types, principles, uses, Limitations of goniometry, Techniques for measurement of ROM for all peripheral joints</li> </ol>	

<p>c). Tests for neuromuscular efficiency</p> <p>i. Electrical tests</p> <p>ii. Manual Muscle Testing: Introduction to MMT, Principles &amp; Aims, Indications &amp; Limitations, Techniques of MMT for group &amp; individual: Techniques of MMT for upper limb / Techniques of MMT for lower limb / Techniques of MMT for spine.</p> <p>iii. Anthropometric Measurements: Muscle girth – biceps, triceps, forearm, quadriceps, calf</p> <p>iv. Static power Test</p> <p>v. Dynamic power Test</p> <p>vi. Endurance test</p> <p>vii. Speed test</p> <p>d.) Tests for Co-ordination</p> <p>e.) Tests for sensation</p> <p>f.) Pulmonary Function tests</p> <p>g.) Measurement of Limb Length: true limb length, apparent limb length, segmental limb length</p> <p>h). Measurement of the angle of Pelvic Inclination</p>	
<b>Unit III: Relaxation</b>	<b>8</b>
<b>hours</b>	
<p>1) Definitions: Muscle Tone, Postural tone, Voluntary Movement,</p> <p>2) Degrees of relaxation,</p> <p>3) Pathological tension in muscle,</p> <p>4) Stress mechanics, types of stresses, Effects of stress on the body mechanism,</p> <p>5) Indications of relaxation, Methods &amp; techniques of relaxation</p> <p>6) Principles &amp; uses: General, Local, Jacobson's, Mitchel's, additional methods.</p>	
<b>Unit IV: Active, Passive, Free exercise, Active-Assisted Exercise and Types of Resisted Exercise</b>	<b>15</b>
<b>hours</b>	
<ul style="list-style-type: none"> <li>● Passive Movements</li> </ul> <p>a. Causes of immobility, Classification of Passive movements, Specific definitions related to</p>	

<p>passive movements, Principles of giving passive movements, Indications, contraindications, effects of uses , Techniques of giving passive movements.</p> <ul style="list-style-type: none"> <li>● Active Movements</li> </ul> <p>a. Definition of strength, power &amp; work, endurance, muscle actions.</p> <p>b. Physiology of muscle performance: structure of skeletal muscle, chemical &amp; mechanical events during contraction &amp; relaxation, muscle fiber type, motor unit, force gradation.</p> <p>c. Causes of decreased muscle performance</p> <p>d. Physiologic adaptation to training: Strength &amp; Power, Endurance.</p> <p>e. Types of active movements</p> <ul style="list-style-type: none"> <li>● Free exercise: <ul style="list-style-type: none"> <li>Classification, principles, techniques, indications, contraindications, effects and uses</li> </ul> </li> <li>● Active Assisted Exercise: <ul style="list-style-type: none"> <li>principles, techniques, indications, contraindications, effects and uses</li> </ul> </li> </ul> <p>Assisted-Resisted Exercise: principles, techniques, indications, contraindications, effects and uses</p> <ul style="list-style-type: none"> <li>● Resisted Exercise: Definition, principles, indications, contraindications, precautions &amp; techniques, effects and uses</li> </ul> <p>Types of resisted exercises: Manual and Mechanical resistance exercise, Isometric exercise, Dynamic exercise: Concentric and Eccentric, Dynamic exercise: Constant versus variable resistance, Isokinetic exercise, Open-Chain and Closed-Chain exercise.</p>	
<b>Unit V: Therapeutic Massage</b>	<b>12</b>
<b>hours</b>	
<p>1. History and Classification of Massage Technique</p> <p>2. Principles, Indications and Contraindications</p> <p>3. Technique of Massage Manipulations</p> <p>4. Physiological and Therapeutic Uses of Specific Manipulations</p>	
<b>Unit VI: Mindfulness plus marathons</b>	<b>8</b>
<b>hours</b>	
<p>Concept of Mindfulness plus marathons</p>	

### Suggested Reading

- M. Dena Gardiner. Principles of Exercise Therapy 4<sup>th</sup> edition, , CBS Publishers & Distributors Pvt Ltd, 2005, ISBN: 978-8123908939
- Margaret Hollis & Phyl Fletcher Cooks. Practical Exercise Therapy 4<sup>th</sup> edition, Wiley Publishers, 1999, ISBN: 9780632049738
- Carolyn Kisner, Lynn Allen Colby. Therapeutic Exercise: Foundations and Techniques 6<sup>th</sup> edition, F.A. Davis Company, 2012, ISBN: 978-0803625747
- Pamela K Levangie, Cynthia C Norkins. Joint Structure and Function: A Comprehensive Analysis 5<sup>th</sup> edition, , F. A. Davis Company, 2010, ISBN: 978-0803623620

<b>Name of The Course</b>	<b>Introduction to quality and patient safety</b>			
<b>Course Code</b>	<b>BPHY3006</b>			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	1	0	0	1

### Course Objectives

#### The student is expected to study:

1. To study the fundamentals of patient safety, evaluation of quality and quality measures and principles of quality improvement.
2. To understand the basic concepts of quality in health Care and develop skills to implement sustainable quality assurance programs in the health system.
3. To study about the basic life support and emergency care

### Course Outcomes

<b>CO1</b>	To develop the basic concepts of quality care and basic emergency care.
<b>CO2</b>	To illustrate the prevention of harm to workers, property, the environment and the general public.

### Continuous Assessment Pattern

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test(CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
50	00	00	50

#### Course Content:

#### Unit I: Quality care and Emergency care, Infection prevention and control

- ❖ **Quality assurance and management**
  - Concepts of Quality of Care
  - Quality Improvement Approaches
  - Standards and Norms
  - Quality Improvement Tools
  - Introduction to NABH guidelines
- ❖ **Basics of emergency care and life support skills**
  - Vital signs and primary assessment
  - Basic emergency care – first aid and triage
  - Ventilations including use of bag-valve-masks (BVMs)
  - Choking, rescue breathing methods
  - One- and Two-rescuer CPR
  - Using an AED (Automated external defibrillator).
  - Managing an emergency including moving a patient

#### Unit II: Bio-medical waste management and Disaster preparedness and management

- Definition of Biomedical Waste
- Waste minimization
- BMW – Segregation, collection, transportation, treatment and disposal (including color coding)
- Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste
- BMW Management & methods of disinfection
- Modern technology for handling BMW

- Use of Personal protective equipment (PPE)
- Monitoring & controlling of cross infection (Protective devices)
- Fundamentals of emergency management,
- Psychological impact management,
- Resource management,
- Preparedness and risk reduction,
- Key response functions (including public health, logistics and governance, recovery, rehabilitation and reconstruction), information management, incident command and institutional mechanisms.

### Suggested Reading

1. CM Francis, Mario C De Souza. Hospital Administration, 3/e, 2004, JappeBrothers, ISBN9788171797219
2. Aspi F Golwalla, Sharukh A Golwalla. A Handbook of Emergencies, 8/e, 2015, JappeBrothers, ISBN9789351524724
3. Singh Anantpreet, Kaur Sukhjit, Biomedical Waste Disposal.1/e, 2008, JappeBrothers, ISBN978935025554

Name of The Course	Pathology (Lab)			
Course Code	BPHP3007			
Prerequisite				
Co-requisite				
Anti-requisite				
	L	T	P	C
	0	0	2	1

### Course Objectives

1. To describe the classification and characteristics of disease producing micro-organisms.
2. To describe the histopathological changes in various conditions.

### Course Outcomes

CO1	To interpret the different type of cytological and specimen slides.
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CO2	To demonstration of slides of common histopathological, and specimens and charts and their interpretations
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### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
30		70	100

### Course Content:

1. Demonstration of slides of common histopathological and specimens
2. Demonstration of slides of common haematological and and specimens
3. Determination of Erythrocyte Sedimentation Rate (ESR)
4. Charting and interpretation of cytological slides and specimens
5. Blood Collection
6. Use of antiseptics, disinfectants and insecticides in a tissue culture processing laboratory
7. Reception and labelling of histological specimens
8. To learn mounting of stained smears
9. Demonstration of instruments used for dissection
10. Pulmonary function test

### Suggested Reading

1. Harsh Mohan. Textbook of Pathology 5th edition, Anshan Publishers, 2005, ISBN : 978-1904798194
2. R. Ananthanarayan, C.K. Panikar. Text Book of Microbiology, Orient Blackswan, 2005, ISBN: 9788125028086
3. Vinay Kumar, Abul K. Abbas, Jon C. Aster. Robbins's Basic Pathology 9th edition, Saunders, 2012, ISBN: 978-1437717815
4. Prescott's Microbiology 8th edition, Joanne M. Willey, Linda M. Sherwood, Christopher J. Woolverton, McGraw-Hill, 2010, ISBN: 978-0077402563

Name of The Course	Microbiology (Lab)			
Course Code	BPHP3008			
Prerequisite				
Co-requisite				
Anti-requisite				
	L	T	P	C
	0	0	2	1

## 10. Demonstration of Fungus

### Course Objectives

#### The student is expected to study:

1. To study the important facts, concepts, and the investigative procedures of a microbiology laboratory.
2. To study the proper use and maintenance of the research grade laboratory equipments.
3. To study the fundamental laboratory methodology.

### Course Outcomes

<b>CO1</b>	To demonstrate the various equipment and sterilization equipment used in microbiology.
<b>CO2</b>	To demonstrate the culture process and motility.

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
30		70	100

### Course Content:

List of Practical	30 Hours
<ol style="list-style-type: none"> <li>1. Demonstration of Microscopes and its uses</li> <li>2. Principles of common sterilization equipment</li> <li>3. Uses of common sterilization equipment</li> <li>4. Demonstration of common sterilization equipment</li> <li>5. Demonstration of common culture media</li> <li>6. Demonstration of motility by hanging drops method</li> <li>7. Demonstration of Gram Stain</li> <li>8. Demonstration of ZN Stain</li> <li>9. Demonstration of Serological test: ELISA</li> </ol>	

### Suggested Reading

1. R. Ananthanarayan, C.K. Panikar. Text Book of Microbiology, Orient Blackswan, 2005, ISBN: 9788125028086
2. Talaro, K., Chess, B., Foundations in Microbiology, 8th Ed.
3. Lammert, John M., Techniques in Microbiology A Student Handbook.
4. Prescott's Microbiology 8<sup>th</sup> edition, Joanne M. Willey, Linda M. Sherwood, Christopher J. Woolverton, McGraw-Hill, 2010, ISBN: 978-0077402563
5. Dr. D. R. Arora. Textbook of Microbiology 2<sup>nd</sup> edition, CBS Publishers, 2003, ISBN: 9788123909233

Name of The Course	Biomechanics (Lab)			
Course Code	BPHP3009			
Prerequisite				
Co-requisite				
Anti-requisite				
	L	T	P	C
	0	0	4	2

### Course objective:

The student is expected to study:

1. Interpret the alignment of the body in erect standing posture and its variability
2. Illustrate the current understanding of the muscle needed to control erect standing
3. Interpret common postural faults

### On course completion the student will be able to:

<b>CO1</b>	<b>To Differentiate normal and abnormal posture.</b>
<b>CO2</b>	<b>To Interpret normal and abnormal gait analysis</b>

### Continuous Assessment Pattern

Internal Assessment (IA)	Mid Term Test (CAT)	End Term Test (ETE)	Total Marks
30		70	100

**Course Contents:**

List of Practical	30 Hours
	<ol style="list-style-type: none"> <li>1. Identify normal and abnormal posture.</li> <li>2. Gait Deviations – types, causative factors</li> <li>3. General features of gait, gait initiation</li> <li>4. Kinematics and kinetics of gait</li> <li>5. Kinematics and kinetics of the trunk and upper extremities in relation to gait Stair and running</li> <li>6. Effects of age, gender, assistive devices, disease, muscle weakness, paralysis, asymmetries of the lower extremities, injuries and malalignments in gait</li> <li>7. Normal gait with its parameters and identify abnormal gait with the problems in it.</li> <li>8. Movement analysis</li> <li>9. Biomechanics of hip joint</li> <li>10. Different Joints as a lever</li> </ol>

**Text Books:**

- Pamela K. Levangie, Cynthia C. Norkin. Joint structure & function: A Comprehensive Analysis 5<sup>th</sup> edition, F. A. Davis Company, 2010, ISBN: 978-0803623620

**Reference Books:**

- Florence Peterson Kendall, Elizabeth Kendall McCreary, Patricia GeiseProvance, Mary McIntyre Rodgers, William Anthony Romani. Muscles: Testing and Function, with Posture and Pain 5<sup>th</sup> edition, Lippincott Williams & Wilkins, 2005, ISBN: 978-0781747806

- Laura Smith, Elizabeth Weiss, Don Lehmkuhl. Brunnstrom's Clinical Kinesiology 5<sup>th</sup> edition, F.A. Davis Company, 1996, ISBN: 978-0803679160
- Carol A. Oatis. Kinesiology: The Mechanics and Pathomechanics of Human Movement 2nd edition, Lippincott Williams & Wilkins, 2008, ISBN: 978-0781774222
- Freddy M Kaltenborn, Eileen Vollowitz. Manual Mobilization of the Joints - The Extremities 7th edition, Orthopedic Physical Therapy Products, 2011, ISBN: 978-8270540709

Name of The Course	Foundation of Exercise Therapy and therapeutic massage (Lab)			
Course Code	BPHY3010			
Prerequisite				
Co-requisite				
Anti-requisite				
	L	T	P	C
	0	0	4	2

**Course Objectives****The student is expected to study:**

1. Various methods of assessment of the physical parameters like joint ROM, muscle strength etc.
2. The principles of exercise therapy e.g., relaxation, stretching, resisted exercises, massage.

**Course Outcomes**

CO1	Assess the Principle of Exercise and massage therapy
CO2	Asses a patient applying the techniques of measuring range of motion for a joint, tests for neuromuscular efficiency, techniques of MMT
CO3	To interpret the principles of relaxation training and resisted exercises

**Continuous Assessment Pattern**

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
30		70	100

**Course Content:**



**List of Practical:**

1. Different test methods
2. Demonstrate relaxation techniques.
3. Demonstrate to apply the technique of passive movements
4. Demonstrate various techniques of Active movements
5. Demonstrate massage technique application according to body parts.
6. Demonstrate various resisted exercises.
7. Demonstrate use of active assisted movements.
8. Demonstrate normal ROM of joints of upper limb
9. Demonstrate normal ROM of joints of lower limb
10. Demonstrate MMT techniques

- To understand the concept and basic principles to know electrotherapy equipment is given under this topic.
- The student will be taught about physics related to electrotherapy and application on human body tissues.

**Course Outcomes**

CO1	To demonstrate knowledge and understanding of physical principles, structure and properties of matter and electricity.
CO2	To apply the principles magnetism & Ohm's law, A.C & D.C Current
CO3	To utilize the knowledge of current electricity and its chemical effects in human body.

**Continuous Assessment Pattern**

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

**Course Contents:**
**Unit I: Physical principle and electrical supply  
8 hours**

- ❖ Structure and properties of matter-solids, liquids and gases, adhesion, surface tension, viscosity, density and elasticity.
- ❖ Structure of atom, molecules, elements and compound
- ❖ Electricity: Definition and types. Therapeutic uses. Basic physics of construction. Working & Importance of currents in treatment.
- ❖ Static Electricity: Production of electric charge. Characteristic of a charged body & Characteristics of lines of forces. Potential energy and factors on which it depends. Potential difference and EMF.
- ❖ Current Electricity: Units of Electricity: farad, Volt, Ampere, Coulomb, Watt, Condensers: Definition, principle, Types- construction and working, capacity & uses
- ❖ Brief outline of main supply of electric current

**Suggested Reading**

- M. Dena Gardiner. Principles of Exercise Therapy 4<sup>th</sup> edition, CBS Publishers & Distributors Pvt Ltd, 2005, ISBN: 978-8123908939
- Margaret Hollis & Phyl Fletcher Cooks. Practical Exercise Therapy 4<sup>th</sup> edition, Wiley Publishers, 1999, ISBN: 9780632049738
- Carolyn Kisner, Lynn Allen Colby. Therapeutic Exercise: Foundations and Techniques 6<sup>th</sup> edition, F.A. Davis Company, 2012, ISBN: 978-0803625747
- Pamela K Levangie, Cynthia C Norkins. Joint Structure and Function: A Comprehensive Analysis 5<sup>th</sup> edition, F. A. Davis Company, 2010, ISBN: 978-0803623620

<b>Name of The Course</b>	<b>BIOPHYSICS</b>			
<b>Course Code</b>	<b>BPHY4002</b>			
<b>Prerequisite</b>				
<b>Corequisite</b>				
<b>Antirequisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>

**Course Objective:  
To Study**

- ❖ Dangers-short circuit, electric shocks: Micro/Macro shocks
- ❖ Precaution-safety devices, earthing, fuses etc.
- ❖ First aid and initial management of electric shock
- ❖ Burns: electrical & chemical burns, prevention and management

## Unit II: MAGNETISM.

7 hours

- ❖ Magnetism: Definition. Properties of magnets. Electromagnetic induction. Transmission
  - by contact. Magnetic field and magnetic forces. Magnetic effects of an electric field.
- ❖ Conductors, Insulators, Potential difference, Resistance and intensity
- ❖ Ohm's law and its application to DC and AC currents. Fuse: construction, working and
  - application.
- ❖ Transmission of electrical energy through solids, liquids, gases and vacuum.
- ❖ Rectifying Devices-Thermionic valves, Semiconductors, Transistors, Amplifiers,
  - transducer and Oscillator circuits.
- ❖ Display devices and indicators-analogue and digital.
- ❖ Transformer: Definition, Types, Principle, Construction, Eddy current, working uses
- ❖ Chokes: Principle, Construction and working, Uses

- Susan L. Michlovitz. Thermal Agents in Rehabilitation, F a Davis Co, 1990, ISBN: 978-0803661653
- Angela Forster. Clayton's Electrotherapy: Theory & Practice 8th edition, CBS Publishers & Distributors, 2007, ISBN: 978-8123908595
- Joseph Kahn. Principles and Practice of Electro Therapy 4th edition, Churchill Livingstone, 2000, ISBN: 978-0443065538
- Roger M. Nelson, Karen W Hayes, Dean P. Currier. Clinical Electrotherapy 3rd edition, Appleton & Lange publishers, 1999, ISBN: 9780838514917

<b>Name of The Course</b>	<b>BIOPHYSICS (lab)</b>			
<b>Course Code</b>	<b>BPT4005</b>			
<b>Prerequisite</b>				
<b>Corequisite</b>				
<b>Antirequisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

### Course Objectives

#### To study

- To understand the concept and basic principles to know electrotherapy equipment is given under this topic.
- The student will be taught about physics related to electrotherapy and application on human body tissues.

### Course Outcomes

CO1	To utilize the knowledge of current electricity and its chemical effects in human body tissue.
CO2	Apply the knowledge of electrical supply and their dangers, precaution, first aid and initial management of electric shock.

### Suggested Reading

- Val Robertson, Alex Ward, John Low, Ann Reed. Electro therapy explained: Principles & practice 4th edition, Butterworth-Heinemann publishers, 2006, ISBN: 978-0750688437
- Sheila Kitchen, Sarah Bazin. Electrotherapy: Evidence Based Practice 11th edition, Churchill Livingstone, 2002, ISBN: 9780443072161
- M.H. Cameron. Physical Agents in Rehabilitation: From Research to Practice 4th edition, Saunders, 2012, ISBN: 978-1455728480

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
30		70	100

### Course Contents:

### List of Experiments

1	Electricity: Definition and types, therapeutic uses. Basic Physics of construction working.
2	To understand the basic principle of Magnetism, its transmission, magnetic field, effects and forces
3	Ohms law, its application to AC and DC currents. Fuse: construction, working and application.
4	To understand electromagnetic Radiation its physical principle and their relevance to physiotherapy practice
5	To understand electric currents its physical principle and their relevance to physiotherapy practice
6	To understand about the thermal agents its physical principle, transmission, difference between superficial and deep heat.
7	To understand about electric shock, causes, types and precautions.
8	To understand about Earthing.
9	To understand about Electric currents.
10	To understand about first aid and initial management.

### Suggested Reading

- Val Robertson, Alex Ward, John Low, Ann Reed. Electrotherapy explained: Principles & practice 4<sup>th</sup> edition, Butterworth-Heinemann publishers, 2006, ISBN: 978-0750688437
- Sheila Kitchen, Sarah Bazin. Electrotherapy: Evidence Based Practice 11<sup>th</sup> edition, Churchill Livingstone, 2002, ISBN: 9780443072161
- M.H. Cameron. Physical Agents in Rehabilitation: From Research to Practice 4<sup>th</sup> edition, Saunders, 2012, ISBN: 978-1455728480.

- Susan L. Michlovitz. Thermal Agents in Rehabilitation, F a Davis Co, 1990, ISBN: 978-0803661653
  - Angela Forster. Clayton's Electrotherapy: Theory & Practice 8th edition, CBS Publishers & Distributors, 2007, ISBN: 978-8123908595
  - Joseph Kahn. Principles and Practice of Electro Therapy 4th edition, Churchill Livingstone, 2000, ISBN: 978-0443065538
- Roger M. Nelson, Karen W Hayes, Dean P. Currier. Clinical Electrotherapy 3rd edition, Appleton & Lange publishers, 1999, ISBN: 9780838514917**

Name of The Course	CLINICAL Posting (15 days)			
Course Code	BPHP 3012			
Prerequisite				
Corequisite				
Antirequisite				
	L	T	P	C
	0	0	4	2

### Course Objectives

**1. To sensitize potential learners with essential knowledge, this will lay a sound foundation for their learning across the under-graduate program and across their career**

2. To ensure the attention of a student and make them more receptive such as group activities, interactive fora, role plays, and clinical bedside demonstrations.

### Course Outcomes

CO1	<b>Understanding of community and health care workers.</b>
CO2	<b>Understanding the bedside assessment of a patient or to the course of the disease</b>
CO3	<b>Understanding of different departments in a hospital</b>
CO4	<b>Understanding basic knowledge of modality and its implementation.</b>

<b>CO5</b>	Understanding basic knowledge of exercise therapy and its implementation
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### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
50	00	00	50

### Course Contents:

<b>Unit-1</b>
The community orientation and clinical visit will include visit to the entire chain of healthcare delivery system -Sub centre, PHC, CHC, SDH, DH and Medical college, private hospitals, dispensaries and clinics.
<b>Unit-2</b>
The student will also be briefed regarding information about a patient's clinical status including signs, symptoms, and course of a disease
<b>Unit-3</b>
Clinical visit to their respective professional department within the hospital.
<b>Unit-4</b>
The students will learn about the construction and principle of working of various electrotherapeutic modalities and will be explained the indications, contraindications and harmful effects of the same. They will be taught to perform a check for all modalities. This will enable the students to apply these modalities for therapeutic purpose efficiently.
<b>Unit-5</b>
develop the skills of the students in areas like assessment of physical parameters (joint range of motion, muscle strength etc) and principles of exercise therapy (strengthening, stretching, goniometry etc) and its application.

### Suggested Reading

### Text Book (s):

- Textbook of rehabilitation by S. Sunders
- **Tidy's Physiotherapy, 12th edition, Ann M. Thomson, Alison T. Skinner, Joan Piercy, Butterworth-Heinemann, 1991, ISBN: 978-0750613460**
- Carolyn Kisner, Lynn Allen Colby. Therapeutic Exercise: Foundations and Techniques 6<sup>th</sup> edition, F.A. Davis Company, 2012, ISBN: 978-0803625747
- **Val Robertson, Alex Ward, John Low, Ann Reed. Electro therapy explained: Principles & practice 4<sup>th</sup> edition, Butterworth-Heinemann publishers, 2006, ISBN: 978-0750688437**

### Reference Book (s)

- **Susan L. Michlovitz. Thermal Agents in Rehabilitation, F a Davis Co, 1990, ISBN: 978-0803661653**
- **David J. Magee. Orthopedic Physical Assessment 5<sup>th</sup> edition, Elsevier Health Sciences, 2008, ISBN: 978-0721605715**

<b>Course Code</b>	BPHY 4001			
<b>Name of Course</b>	Exercise Therapy			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	5	0	0	5

### Course Objectives

#### To study:

1. Various methods of assessment of the physical parameters like joint ROM, muscle strength etc
2. The principles of exercise therapy e.g. co-ordination, re-education, strengthening, mobilization.

### Course Outcomes

CO 1	To demonstrate knowledge and understanding of specific exercise & PNF.
CO 2	To utilize the knowledge of Suspension therapy, Hydrotherapy & Functional Re-education Exercises.
CO 3	Apply the knowledge of Aerobic & Stretching Exercises.
CO 4	To utilize the knowledge of Manual therapy & Peripheral joint mobilization.
CO 5	Demonstrate application of Balance & co-ordination, posture & walking aids.
CO 6	Evaluate recent advances in exercise therapy

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

### Course Content:

<p><b>Unit I: Introduction to specific exercise &amp; PNF</b></p> <p><b>12 Hours</b></p> <ul style="list-style-type: none"> <li>Specific exercise regimens           <ol style="list-style-type: none"> <li>Isotonic: de Lormes, Oxford, MacQueen, Circuit weight training</li> <li>Isometric: BRIME (Brief Resisted Isometric Exercise), Multiple Angle</li> <li>Isometrics Isokinetic regimens</li> </ol> </li> <li>Proprioceptive Neuromuscular Facilitation           <ol style="list-style-type: none"> <li>Techniques of facilitation</li> <li>Mobility: Contract relax, Hold relax, Rhythmic initiation</li> <li>Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization</li> <li>Stability: Alternating isometric, rhythmic stabilization</li> <li>Skill: timing for emphasis, resisted progression</li> <li>Endurance: slow reversals, agonist reversal</li> </ol> </li> </ul>
<p><b>Unit II: Suspension therapy, Hydrotherapy, Functional Re-education &amp; Individual and Group Exercises</b></p> <p><b>12 Hours</b></p> <ul style="list-style-type: none"> <li>Suspension Therapy           <ol style="list-style-type: none"> <li>Definition, principles, equipment &amp; accessories, Indications &amp; contraindications, Benefits of suspension therapy</li> </ol> </li> </ul>

b. Types of suspension therapy: axial, vertical, pendular  
 Techniques of suspension therapy for upper limb  
 Techniques of suspension therapy for lower limb

- Hydrotherapy
  - Definitions, Goals and Indications, Precautions and Contraindications, Properties of water, use of special equipment, techniques, Effects and uses, merits and demerits.
- Functional Re-education
  - Lying to sitting: Activities on the Mat/Bed, Movement and stability at floor level; Sitting activities and gait; Lower limb and Upper limb activities.

Individual and Group Exercises
 

- Advantages and Disadvantages, Organization of Group exercises, Recreational Activities and Sports

### Unit III: Aerobic & Stretching Exercises

**12 Hours**

- Aerobic Exercise
  - Definition and key terms; Physiological response to aerobic exercise, Examination and evaluation of aerobic capacity – Exercise Testing, Determinants of an Exercise Program, The Exercise Program, Normal and abnormal response to acute aerobic exercise, Physiological changes that occur with training, Application of Principles of an Aerobic conditioning program for patients – types and phases of aerobic training.

Stretching
 

- Definition of terms related to stretching; Tissue response towards immobilization and elongation, Determinants of stretching exercise, Effects of stretching, Inhibition and relaxation procedures, Precautions and contraindications of stretching, Techniques of stretching

### Unit IV: Manual therapy & Peripheral joint mobilization

**12Hours**

- Manual Therapy & Peripheral Joint Mobilization
  - Schools of Manual Therapy, Principles, Grades, Indications and Contraindications, Effects and Uses – Maitland, Kaltenborn, Mulligan
  - Biomechanical basis for mobilization, Effects of joint mobilisation, Indications and contraindications, Grades of mobilization, Principles of mobilization, Techniques of mobilization for upper limb, lower limb, Precautions.

Basics in Manual Therapy & Applications with Clinical reasoning
 

- Examination of joint integrity
  - Contractile tissues
  - Non contractile tissues
- Mobility - assessment of accessory movement & End feel
- Assessment of



articular & extra-articular soft tissue status i. Myofascial assessment ii. Acute & Chronic muscle hold iii. Tightness iv. Pain-original & referred d. Basic principles, Indications & Contra-Indications of mobilization skills for joints & soft tissues. i. Maitland ii. Mulligan iii. Mckenzie iv. Muscle Energy Technique v. Myofascial stretching vi. Cyriax vii. Neuro Dynamic Testing

**Unit V: Balance & co-ordination, posture & walking**

**aids 8 Hours**

- Balance - Definition a. Physiology of balance: contributions of sensory systems, processing sensory information, generating motor output b. Components of balance (sensory, musculoskeletal, biomechanical) c. Causes of impaired balance, Examination & evaluation of impaired balance, Activities for treating impaired balance: mode, posture, movement, Precautions & contraindications, Types Balance retraining.
- Co-ordination Exercise a. Anatomy & Physiology of cerebellum with its pathways Definitions: Co-ordination, Inco-ordination b. Causes for Inco-ordination, Test for co-ordination: equilibrium test, non-equilibrium test Principles of co-ordination exercise. c. Frenkel's Exercise: uses of Frenkel's exercise, technique of Frenkel's exercise, progression, home exercise.
- Posture a. Definition, Active and Inactive Postures, Postural Mechanism, Patterns of Posture, Principles of re-education: corrective methods and techniques, Patient education.
- Walking Aids a. Types: Crutches, Canes, Frames; Principles and training with walking aids.

Unit VI: Recent Advances in exercise therapy 4 hours

Use of techno body for gait rehabilitation  
Recent advances in exercise prescription  
Rehabilitation Robotics  
Cupping therapy

- **Margaret Hollis & Phyl Fletcher Cooks. Practical Exercise Therapy 4<sup>th</sup> edition, Wiley Publishers, 1999, ISBN: 9780632049738**
- **Carolyn Kisner, Lynn Allen Colby. Therapeutic Exercise: Foundations and Techniques 6<sup>th</sup> edition, F.A. Davis Company, 2012, ISBN: 978-0803625747**

Name of The Course	Electrotherapy (LMHF & Equipment care)			
Course Code	BPHY4003			
Prerequisite				
Co-requisite				
Anti-requisite				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	5	0	0	5

**Course Objective:**

1. To study about the Principles, Techniques, Effects, Indication and Contra-Indication of various therapeutic modalities.
2. To study about the importance of dosage parameter of various electro therapeutic modalities in the restoration of physical function.

**Course Outcomes**

<b>CO1</b>	To apply the principles of therapeutic low frequency currents in clinical practice.
<b>CO2</b>	To apply the principles of common electrodiagnostic tools for clinical evaluation.
<b>CO3</b>	To apply the principles of therapeutic medium frequency currents in clinical practice.
<b>CO4</b>	To determine the therapeutic effects, methods of application, dosimetry, indication and contraindication of High frequency currents.

**Suggested Reading**

- **1.M. Dena Gardiner. Principles of Exercise Therapy 4<sup>th</sup> edition, CBS Publishers & Distributors Pvt Ltd, 2005, ISBN: 978-8123908939**



CO5	To determine the therapeutic effects, methods of application, indication and contraindication of superficial and deep heating modalities.
CO6	<b>Unit 6 - Recent advances in Electrotherapy (8hours)</b>

### Continuous Assessment Pattern

Internal Assessment (IA)	Mid Term Test (CAT)	End Term Test (ETE)	Total Marks
10	20	70	100

### Course Content:

<b>Unit-1: Introduction to Low frequency Currents</b>
<p>A. Basic types of current</p> <ol style="list-style-type: none"> <li>a. Direct Current: types, physiological &amp; therapeutic effects.</li> <li>b. Alternating Current</li> </ol> <p>B. Types of Current used in Therapeutics</p> <ol style="list-style-type: none"> <li>a. Modified D.C           <ol style="list-style-type: none"> <li>i. Faradic Current</li> <li>ii. Galvanic Current</li> </ol> </li> <li>b. Modified A.C           <ol style="list-style-type: none"> <li>i. Sinusoidal Current</li> <li>ii. Didynamic Current.</li> </ol> </li> </ol> <p>C. Sinusoidal Current &amp; Didynamic Current in Brief.</p> <p>D. HVPGS – Parameters &amp; its uses</p> <p>E. Ionization/Iontophoresis: Techniques of Application of Iontophoresis, Indications, Selection of Current, commonly used Ions (Drugs) for pain, hyperhidrosis, wound healing.</p> <p>F. Cathodal / Anodal galvanism.</p> <p>G. Micro Current &amp; Macro Current</p> <p>H. Types of Electrical Stimulators</p> <ol style="list-style-type: none"> <li>a. NMES- Construction component.</li> </ol>

<ol style="list-style-type: none"> <li>b. Neuro muscular diagnostic stimulator- construction component.</li> <li>c. Components and working Principles</li> </ol> <p>I. Principles of Application: Electrode tissue interface, Tissue Impedance, Types of Electrode, Size &amp; Placement of Electrode – Waterbath, Unipolar, Bi-polar, Electrode coupling, Current flow in tissues, Lowering of Skin Resistance.</p> <p>J. Nerve Muscle Physiology: Action Potential, Resting membrane potential, Propagation of Action Potential, Motor unit, synapse, Accommodation, Stimulation of Healthy Muscle, Stimulation of Denervated Muscle, and Stimulation for Tissue Repair.</p> <p>K. TENS: TENS with its Types. Types of Electrodes &amp; Placement of Electrodes, Dosage parameters, Physiological &amp; Therapeutic effects, Indications &amp; Contraindications.</p> <ol style="list-style-type: none"> <li>i. Pain: Define Pain, Theories of Pain (Outline only), Pain Gate Control theory in detail.</li> </ol>
<b>Unit-2: Electro-diagnosis</b>
<p>A. SD Curve: Methods of Plotting SD Curve, Apparatus selection, Characters of Normally innervated Muscle, Characters of Partially Denervated Muscle, Characters of Completely denervated Muscle, Chronaxie &amp; Rheobase.</p> <p>B. Nerve conduction velocity studies</p> <p>C. EMG: Construction of EMG equipment.</p> <p>D. Bio-feedback.</p>
<b>Unit-3: Medium Frequency</b>

- A. Interferential Therapy: Define IFT, Principle of Production of IFT, Static Interference System,
- Dynamic Interference system, Dosage Parameters for IFT, Electrode placement in IFT,
  - Physiological & Therapeutic effects, Indications & Contraindications.
- B. Russian Current
- C. Rebox type Current

#### Unit- 4: Thermo & Actinotherapy (High Frequency Currents)

- A. Electro Magnetic Spectrum.
- B. SWD: Define shortwave, Frequency Wavelength of SWD, Principle of Production of SWD, Circuit diagram & Production of SWD, Methods of Heat Production by SWD treatment, Types of SWD Electrode, Placement & Spacing of Electrodes, Tuning, Testing of SWD Apparatus, Physiological & Therapeutic effects, Indications & Contraindications, Dangers, Dosage, parameters.
- C. Pulsed Electro Magnetic Energy: Principles, Production & Parameters of PEME, Uses of
- PEME.
- D. Micro Wave Diathermy: Define Microwave, Wave length & Frequency, Production of MW,
- Applicators, Dosage Parameters, Physiological & Therapeutic effects, Indications & Contraindications, Dangers of MWD. [2 Hours]
- E. Ultrasound: Define Ultrasound, Frequency, Piezo Electric effects: Direct, Reverse, Production of US, Treatment Dosage parameters: Continuous & Pulsed mode, Intensity, US Fields: Near field, Far field, Half value distance, Attenuation, Coupling Media, Thermal effects, Non-thermal effects, Principles & Application of US: Direct contact, Water bag, Water bath, Solid sterile gel pack method for wound. Uses of US, Indications &

Contraindications, Dangers of Ultrasound. Phonophoresis: Define Phonophoresis, Methods of application, commonly used drugs, Uses. Dosages of US. [8 Hours]

- F. IRR: Define IRR, wavelength & parameters, Types of IR generators, Production of IR, Physiological & Therapeutic effects, Duration & frequency of treatment, Indication & Contraindication. [2 Hours]
- G. UVR: Define UVR, Types of UVR, UVR generators: High pressure mercury vapour lamp, Water cooled mercury vapour lamp, Kromayer lamp, Fluorescent tube, Theraktin tunnel, PUVA apparatus. Physiological & Therapeutic effects. Sensitizers & Filters. Test dosage calculation. Calculation of E1, E2, E3, E4 doses. Indications, contraindications. Dangers. Dosages for different therapeutic effects, Distance in UVR lamp [8 Hours]
- H. LASER: Define LASER. Types of LASERS. Principles of Production. Production of LASER by various methods. Methods of application of LASER. Dosage of LASER. Physiological & Therapeutic effects of LASER. Safety precautions of LASER. Classifications of LASER. Energy density & power density [8 Hours]

#### UNIT-5 Superficial heating Modalities

- A. Wax-therapy: Principle of Wax-therapy application—latent Heat, Composition of Wax-bath Therapy unit, Methods of application of Wax, Physiological & Therapeutic effects, Indications & Contraindication, Dangers.
- B. Contrast Bath: Methods of application, Therapeutic uses, Indications & Contraindications.
- C. Moist Heat Therapy: Hydro collar packs in brief, Methods of applications, Therapeutic uses, Indications & Contraindications.

- D. Cyclotherm: Principles of production, Therapeutic uses, Indications & Contraindications.
- E. Fluid therapy: Construction, Method of application, Therapeutic uses, Indications & Contraindications.
- F. Whirl Pool Bath: Construction, Method of Application, Therapeutic Uses, Indications & Contraindications.
- G. Magnetic Stimulation, Principles, Therapeutic uses, Indications & contraindication.
- H. Cry therapy: Define- Cry therapy, Principle- Latent heat of fusion, Physiological & Therapeutics effects, Techniques of Applications, Indications & Contraindications, Dangers, and Methods of application with dosages.

**Unit 6 - Recent advances in electrotherapy (8hours)**

**1. Shock wave therapy- ESWT (Extracorporeal shock wave therapy)-** Physiological & Therapeutics effects, Techniques of Applications, Indications & Contraindications, Dangers, and Methods of application with dosages.

**2. Cranial Electrotherapy Stimulation (CES)** – Physiological & Therapeutics effects, Techniques of Applications, Indications & Contraindications, Dangers, and Methods of application with dosages.

From Research to Practice 4<sup>th</sup> edition, Saunders, 2012, ISBN: 978-1455728480.

Reference Book (s)

- SusanL. Michlovitz. Thermal Agents in Rehabilitation, F a Davis Co, 1990, ISBN: 978-0803661653
- Angela Forster. Clayton's Electrotherapy: Theory & Practice 8<sup>th</sup> edition, CBS Publishers & Distributors, 2007, ISBN: 978-8123908595
- Joseph Kahn. Principles and Practice of Electrotherapy 4<sup>th</sup> edition, Churchill Livingstone, 2000, ISBN: 978-0443065538
- Roger M. Nelson, Karen W Hayes, Dean P. Currier. Clinical Electrotherapy 3<sup>rd</sup> edition, Appleton & Lange publishers, 1999, ISBN: 9780838514917

<b>Name of The Course</b>	Exercise Therapy (Lab)			
<b>Course Code</b>	BPHP4004			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	0	0	6	3

**Course Objectives**

**To study:**

- **Various methods of assessment of the physical parameters like joint ROM, muscle strength etc**
- **The principles of exercise therapy e.g. co-ordination, re-education, strengthening, mobilization, Goniometry.**

**Course Outcomes**

<b>CO 1</b>	To demonstrate knowledge and understanding of specific exercise & PNF.
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**Suggested Reading**

Text Book (s)

- Val Robertson, Alex Ward, John Low, Ann Reed. Electrotherapy explained: Principles & practice 4<sup>th</sup> edition, Butterworth-Heinemann publishers, 2006, ISBN: 978-0750688437
- Sheila Kitchen, Sarah Bazin. Electrotherapy: Evidence Based Practice 11<sup>th</sup> edition, Churchill Livingstone, 2002, ISBN: 9780443072161
- M.H. Cameron. Physical Agents in Rehabilitation:

<b>CO 2</b>	To utilize the knowledge of Suspension therapy, Hydrotherapy & Functional Re-education Exercises
<b>CO 3</b>	Apply the knowledge of Aerobic & Stretching Exercises.
<b>CO 4</b>	To utilize the knowledge of Manual therapy & Peripheral joint mobilization.
<b>CO 5</b>	Demonstrate application of Balance & co-ordination, posture & walking aids
<b>CO 6</b>	Application of weight loss training for obese

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
30		70	100

### Course Content:

1.	To demonstrate various PNF techniques
2	To demonstrate techniques of strengthening of muscles using resisted exercises
3	To demonstrate the technique of suspension therapy for mobilizing and strengthening joints and muscles
4	To demonstrate techniques for functional re-education
5	To demonstrate the techniques for muscle stretching
6	To demonstrate techniques for measuring limb

	length and body circumference
7	To demonstrate mobilization of individual joint regions
8	To demonstrate the technique of measuring ROM using goniometry
9	To demonstrate muscle strength using the principles and technique of MMT
10	To demonstrate the techniques for muscle strengthening based on MMT grading
11	To demonstrate the techniques of massage and manipulations
12	To demonstrate exercises for weight loss training

### Text Book (s)

- **M. Dena Gardiner. Principles of Exercise Therapy 4<sup>th</sup> edition, , CBS Publishers & Distributors Pvt Ltd, 2005, ISBN: 978-8123908939**
- **Margaret Hollis & Phyl Fletcher Cooks. Practical Exercise Therapy 4<sup>th</sup> edition, Wiley Publishers, 1999, ISBN: 9780632049738**
- **Carolyn Kisner, Lynn Allen Colby. Therapeutic Exercise: Foundations and Techniques 6<sup>th</sup>**

edition, F.A. Davis Company, 2012, ISBN: 978-0803625747

#### Reference Books:

- M. Lacote, A.M. Chevalier, A. Miranda, J.P. Bleton, P. Stevenin. **Clinical Evaluation of Muscle Function 2<sup>nd</sup> revised edition**, Churchill Livingstone, 1988, ISBN: 978-0443037207
- David J. Magee. **Orthopedic Physical Assessment 5<sup>th</sup> edition**, Elsevier Health Sciences, 2008, ISBN: 978-0721605715
- Margaret Knott, Ionta Voss, James W. Myers, Dorothy E. Voss. **Proprioceptive Neuromuscular Facilitation: Patterns and Techniques 3<sup>rd</sup> revised edition**, Lippincott Williams and Wilkins, 1985, ISBN: 978-00614259

<b>Name of The Course</b>	<b>Electrotherapy (LMHF &amp; Equipment care) (Lab)</b>			
<b>Course Code</b>	<b>BPHY4006</b>			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	0	0	8	4

#### Course Objectives

The student is expected to study:

- The use of electrotherapy modalities applying the principles of electrotherapy with proper techniques, dosimetry and safety precautions.
- The application of various electrotherapy modalities their indications, contraindications, precautions and harmful effects.

#### Course Outcomes

<b>CO1</b>	To apply the therapeutic currents clinically
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<b>CO2</b>	To demonstrate the knowledge in application of ultraviolet radiations
<b>CO3</b>	To apply the knowledge in application of LASER therapy
<b>CO4</b>	To demonstrate and apply the knowledge in application of superficial and deep heating modalities.
<b>CO5</b>	To apply the proper testing of Electrotherapy modalities in clinical settings.
<b>CO6</b>	To discuss recent advances in electrotherapy.

#### Continuous Assessment Pattern

<b>Internal Assessment (IA)</b>	<b>Mid Term Test (CAT)</b>	<b>End Term Test (ETE)</b>	<b>Total Marks</b>
<b>30</b>		<b>70</b>	<b>100</b>

#### Course Content:

##### List of Practical

1. Demonstrate the technique for patient evaluation – receiving the patient and positioning the patient for treatment using electrotherapy.
2. Collection of materials required for treatment using electrotherapy modalities and testing of the apparatus.
3. Electrical stimulation for the muscles supplied by the peripheral nerves
4. Plotting of SD curve with chronaxie and rheobase and demonstrate FG test
5. Application of Ultrasound for different regions- various methods of application
6. Demonstrate treatment techniques using SWD, IRR and Microwave diathermy and technique of UVR exposure for various conditions – calculation of test dose
7. Demonstrate treatment method using IFT for various regions
8. Calculation of dosage and technique of application of LASER
9. Technique of treatment and application of Hydrocollator packs, cryotherapy, contrast bath, wax therapy, whirl pool bath and Faradism under Pressure for UL and LL
10. Equipment care -
  - a) Checking of equipment

- b) Arrangement of exercise therapy and electro therapy equipment.
- c) Calibration of equipment
- d) Purchase, billing, document of equipment.
- e) Safety handling of equipment.
- f) Research lab equipment maintenance.
- g) Stock register, movement register maintenance

11. Demonstrate application of TENS: Types of TENS, Conventional TENS, and Acupuncture TENS, Burst TENS, Brief & Intense TENS, Modulated TENS. Types of Electrodes & Placement of Electrodes, Dosage parameters, Physiological & Therapeutic effects, Indications & Contraindications.

12. Demonstrate application of Ultrasound: Frequency, Piezo Electric effects: Direct, Reverse, Production of US, Treatment Dosage parameters: Continuous & Pulsed mode, Intensity, US Fields.

- Roger M. Nelson, Karen W Hayes, Dean P. Currier. Clinical Electrotherapy 3<sup>rd</sup> edition, Appleton & Lange publishers, 1999, ISBN: 9780838514917

<b>Name of The Course</b>	<b>Medical Physiotherapy Law and Ethics</b>			
<b>Course Code</b>	<b>BPHY4007</b>			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>

### Course Objectives

1. To study the various legal and ethical medical practice
2. To study how to improve the quality of patient care by identifying, analyzing, and attempting to resolve the ethical problems that arise in practice

### Course Outcomes

<b>CO1</b>	To utilize knowledge for medical ethics and law
<b>CO2</b>	To understand the development of standardised protocols and medicolegal aspects.
<b>CO3</b>	To understand the code of ethics and law for physiotherapist

### Continuous Assessment Pattern

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test (CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
50	00	00	50

### Course Content:

<b>Unit I: Introduction</b> <b>10hours</b>
1. Medical ethics versus medical law - Definition - Goal - Scope
2. Introduction to Code of conduct
3. Basic principles of medical ethics – Confidentiality
4. Malpractice and negligence - Rational and irrational drug therapy

### Suggested Reading

#### Text Book (s)

- Val Robertson, Alex Ward, John Low, Ann Reed. Electrotherapy explained: Principles & practice 4<sup>th</sup> edition, Butterworth-Heinemann publishers, 2006, ISBN: 978-0750688437
- Sheila Kitchen, Sarah Bazin. Electrotherapy: Evidence Based Practice 11<sup>th</sup> edition, Churchill Livingstone, 2002, ISBN: 9780443072161
- M.H. Cameron. Physical Agents in Rehabilitation: From Research to Practice 4<sup>th</sup> edition, Saunders, 2012, ISBN: 978-1455728480.

#### Reference Book (s)

- Susan L. Michlovitz. Thermal Agents in Rehabilitation, F a Davis Co, 1990, ISBN: 978-0803661653
- Angela Forster. Clayton's Electrotherapy: Theory & Practice 8<sup>th</sup> edition, CBS Publishers & Distributors, 2007, ISBN: 978-8123908595
- Joseph Kahn. Principles and Practice of Electro Therapy 4<sup>th</sup> edition, Churchill Livingstone, 2000, ISBN: 978-0443065538



<b>Unit II: Understanding the right of patients</b> <b>10Hours</b>
<b>1.Autonomy and informed consent - Right of patients</b> 2. Care of the terminally ill- Euthanasia <b>3. Organ transplantation</b>
<b>Unit III: Development of standardised protocols and code of ethics and law for physiotherapist</b> <b>10 Hours:</b> 1.Code of ethics for physiotherapists 2. Ethics documents for physiotherapists 3. Laws affecting physiotherapy practice

### Suggested Reading

1. Reflections on Medical Law and Ethics in India Board book  
by Bismi Gopalakrishnan, Mercy Khaute, B. Sandeepa Bhat
2. Medical Negligence and the Law in India: Duties, Responsibilities, Rights  
by Tapas Kumar Koley  
Medical Law and Ethics  
by Jonathan Herring  
Contemporary Issues in Healthcare Law and Ethics (Aupha/Hap Book) by Dean Harris  
parikhs textbook of medical jurisprudence forensic medicine and toxicology for classrooms and courtrooms 7ed (pb 2017) (old edition) by subrahmanyam b.v.

<b>Name of The Course</b>	<b>Clinical Education</b>			
<b>Course Code</b>	<b>BPHY4008</b>			
<b>Prerequisite</b>				
<b>Corequisite</b>				
<b>Antirequisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>0</b>	<b>0</b>	<b>6</b>	<b>3</b>

### Course Objectives

1. Approach to patient, collection of demographic data, art of history taking and bedside / OPD

manners in relation to patient, general assessment of patient from therapeutic point of view, reaching to provisional diagnosis, and testing of therapeutic skill learned.

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

### Course Outcomes

<b>CO1</b>	<b>To demonstrate an understanding of patient's problem and chief complaint.</b>
<b>CO2</b>	<b>To demonstrate the clinical special tests for various musculoskeletal and neurological conditions.</b>
<b>CO3</b>	<b>To employ the best treatment method on patients to achieve a favourable outcome.</b>
<b>CO4</b>	<b>To demonstrate teamwork, leadership, better understanding of the situation and professional qualities in OPD and IPD setups.</b>
<b>CO5</b>	<b>To demonstrate work ethics and maintain records of the patients for future use and follow-up.</b>
<b>Co6</b>	<b>To Practice the techniques of physiotherapy</b>

### Continuous Assessment Pattern

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test(CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
<b>50</b>	<b>00</b>	<b>00</b>	<b>50</b>

### Course Contents:

**Unit-1 Clinical Assessment and examination of Upper limb**

**Clinical Assessment and examination of shoulder**

complex, Clinical Assessment and examination of elbow, Clinical Assessment and examination of wrist joint,
<b>Unit-2 Clinical Assessment and examination of Lower limb</b>  Clinical Assessment and examination of hip joint, Clinical Assessment and examination of knee joint, Clinical Assessment and examination of foot & ankle complex,
<b>Unit-3 Clinical Assessment and examination of Spine</b> Clinical Assessment and examination of upper cervical spine, Clinical Assessment and examination of lower cervical spine, Clinical Assessment and examination of lumbar spine,
<b>Unit-4 Neurological Examination</b> Assessment of higher mental functions, history taking, sensory assessment, motor assessment
<b>Unit-5</b> Case study
<b>Unit 6</b>  <b>8 hours</b>
<p><b>Hands on practice</b></p> <ul style="list-style-type: none"> <li>• Mobilization</li> <li>• Kinesiology taping</li> <li>• Mulligan technique</li>   <li>• workshop to be attended on</li>   <li>• PNF</li> <li>• Recent advances in the field of physiotherapy</li>   <li>• Topic presentation</li> <li>• Case presentation</li> <li>• Presentation on new researches in the field of physiotherapy</li> </ul>

Suggested reading:

**Text Book (s):**

Orthopaedic physical Assessment by David Magee, 6<sup>th</sup> edition, Elsevier India(2014)

**Reference Book (s)**

Textbook of Orthopaedics by John Ebnezar, Jaypee Brothers Medical Publishers

<b>Name of The Course</b>	BPHY 5001			
<b>Course Code</b>	Clinical orthopaedics & traumatology			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	4	0	0	4

**Course Objectives**

The student is expected to study:

1. The fractures and deformities of upper and lower limb
2. The spinal deformities

**Course Outcomes**

<b>CO1</b>	To relate the concept of fractures.
<b>CO2</b>	To interpret the soft tissue injuries and degenerative and rheumatic diseases.
<b>CO3</b>	To interpret the spinal conditions and infectious diseases of musculoskeletal system.
<b>CO4</b>	To interpret the congenital malformations and developmental diseases of skeleton.
<b>CO5</b>	To interpret the neurovascular and neuromuscular conditions and amputation.
<b>CO6</b>	To Propose recent advances in orthopedics

**Continuous Assessment Pattern**

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

**Course Content:**

**Unit I: Introduction to Traumatology & Orthopedic Surgeries 14 Hours**

- ❖ Introduction to orthopedics
- ❖ Clinical examination in an orthopedic patient
- ❖ Common investigative procedures
- ❖ Radiological and Imaging techniques in Orthopedics
- ❖ Inflammation and repair, Soft tissue healing
- ❖ Fracture: definition, types, signs and symptoms.
- ❖ Fracture healing
- ❖ Complications of fractures.
- ❖ **Conservative and surgical approaches**
- ❖ Principles of management – reduction (open/closed, immobilization etc.)
- ❖ Subluxation/ dislocations – definition, signs and symptoms, management (conservative and operative)
- ❖ **Orthopedic Surgeries:**
  - Indications
  - Classification
  - Types
  - **Principles of management of the following Surgeries:**
    - i. Arthrodesis
    - ii. Arthroplasty (partial and total replacement)
    - iii. Osteotomy
    - iv. External fixators
    - v. Spinal stabilization surgeries (Harrington's, Luque's, Steffi plating) etc.
    - vi. Limb re attachments.

**Unit II: Fractures and Dislocations of Upper Limb, Lower Limb & Spine 14 Hours**

- ❖ **Fractures of Upper Limb:**
  - Causes
  - Clinical features
  - Mechanism of injury
  - Complications
  - **Conservative and surgical management of the following fractures:**
    - i. Fractures of clavicle and scapula
    - ii. Fractures of greater tuberosity and neck of humerus.
    - iii. Fracture shaft of humerus.
    - iv. Supracondylar fracture of humerus.
    - v. Fractures of capitulum, radial head, olecranon, coronoid, and epicondyles
    - vi. Side swipe injury of elbow

- vii. Both bone fractures of ulna and radius
- viii. Fracture of forearm – Monteggia, Galeazzi fracture – dislocation
- ix. Chauffeur's fracture
- x. Colle's fracture
- xi. Smith's fracture
- xii. Scaphoid fracture.
- xiii. Fracture of the metacarpals
- xiv. Bennett's fracture
- xv. Fracture of the phalanges. (Proximal and middle)

❖ **Dislocations of Upper Limb:**

- i. Anterior dislocation of shoulder – mechanism of injury, clinical feature, complications, conservative management (Kocher's and Hippocrates maneuver), surgical management (Putti-Platt, Bankart's) etc.
- ii. Recurrent dislocation of shoulder
- iii. Posterior dislocation of shoulder – mechanism of injury, clinical features and management.
- iv. Posterior dislocation of elbow – mechanism of injury, clinical feature, complications & management

❖ **Fracture of Pelvis and Lower Limb:**

- Causes
- Clinical features
- Mechanism of injury
- Complications
- **Conservative and surgical management of the following fractures:**
  - i. Fracture of pelvis
  - ii. Fracture neck of femur – classification, clinical features, complications, management - conservative and surgical
  - iii. Fractures of trochanters
  - iv. Fracture shaft femur – clinical features, mechanism of injury, complications, management - conservative and surgical
  - v. Supracondylar fracture of femur
  - vi. Fractures of the condyles of femur
  - vii. Fracture patella
  - viii. Fractures of tibial condyles
  - ix. Both bones fracture of tibia and fibula
  - x. Dupuytren's fracture
  - xi. Maisonneuve's fracture
  - xii. Pott's fracture – mechanism of injury, management
  - xiii. Bimalleolar fracture

- xiv. Trimalleolar fracture
- xv. Fracture calcaneum – mechanism of injury, complications and management
- xvi. Fracture of talus
- xvii. Fracture of metatarsals—stress fractures joints fracture
- xviii. Fracture of phalanges

❖ **Dislocations of Lower Limb:**

- Mechanism of injury
- Clinical features
- Complications
- **Management of the following dislocations of lower limb:**
  - i. Anterior dislocation of hip
  - ii. Posterior dislocation of hip
  - iii. Central dislocation of hip
  - iv. Dislocation of patella
  - v. Recurrent dislocation of patella

❖ **Fracture of Cervical Spine**

- Mechanism of injury
- Clinical feature
- Complications (quadriplegia)
- Management- immobilization (collar, cast, brace, traction)
- Management for stabilization
- Management of complication (bladder and bowel, quadriplegia)
  - i. Clay shoveller's fracture
  - ii. Hangman's fracture
  - iii. Fracture odontoid
  - iv. Fracture of atlas

❖ **Fracture of Thoracic and Lumbar Regions:**

- Mechanism of injury
- Clinical features
- Management— conservative and surgical of common fractures around thoracic and lumbar regions

❖ **Fracture of coccyx**

**Fracture of Rib Cage - Mechanism of injury, clinical features, management for Fracture ribs, fracture of sternum.**

**Unit III: Regional Disorders & Pathologies**

**16 Hours**

❖ **Spinal Pathologies:**

- Causes
- Clinical feature
- Patho-physiology

- Investigations
- **Management-Medical and surgical for the following:**
  - i. Prolapsed intervertebral disc (PID)
  - ii. Spinal Canal Stenosis
  - iii. Spondylosis (cervical and lumbar)
  - iv. Spondylolysis
  - v. Spondylolisthesis
  - vi. Lumbago/ Lumbosacral strain
  - vii. Sacralisation
  - viii. Lumbarisation
  - ix. Coccydynia
  - x. Hemivertebra

❖ **Regional Conditions**

- Definition
- Clinical features
- **Management of the following regional conditions:**
  - a. Shoulder:**
    - i. Periarthritic shoulder (adhesive capsulitis)
    - ii. Rotator cuff tendinitis
    - iii. Supraspinatus Tendinitis
    - iv. Infraspinatus Tendinitis
    - v. Bicipital Tendinitis
    - vi. Subacromial Bursitis
  - b. Elbow:**
    - i. Tennis Elbow
    - ii. Golfer's Elbow
    - iii. Olecranon Bursitis (student's elbow)
    - iv. Triceps Tendinitis.
  - c. Wrist and Hand:**
    - i. De Quervain's Tenosynovitis
    - ii. Ganglion
    - iii. Trigger Finger/ Thumb
    - iv. Mallet Finger
    - v. Carpal Tunnel Syndrome
    - vi. Dupuytren's Contracture
  - d. Pelvis and Hip:**
    - i. IT Band Syndrome
    - ii. Piriformis Syndrome
    - iii. Trochanteric Bursitis
  - e. Knee:**
    - i. Osteochondritis Dissecans
    - ii. Prepatellar and Suprapatellar Bursitis
    - iii. Popliteal Tendinitis
    - iv. Patellar Tendinitis
    - v. Chondromalacia Patella
    - vi. Plica Syndrome
    - vii. Fat Pad Syndrome (Hoffa's syndrome)

**f. Ankle and Foot:**

- i. Ankle Sprains
- ii. Plantar Fasciitis / Calcaneal Spur
- iii. Tarsal Tunnel Syndrome
- iv. Achilles Tendinitis
- v. Metatarsalgia
- vi. Morton's Neuroma

❖ **Syndromes**

- Causes
- Clinical features
- Complications
- **Management- conservative and surgical of the following:**
  - i. Cervico brachial syndrome
  - ii. Thoracic outlet syndrome
  - iii. Vertebro- basilar syndrome
  - iv. Scalenus syndrome
  - v. Costo clavicular syndrome
  - vi. Levator scapulae syndrome
  - vii. Piriformis syndrome.

**Unit IV: Deformities & Diseases of Bones and Joints****10 Hours**❖ **Deformities**

- Clinical features
- Complications
- **Medical and surgical management of the following Congenital and Acquired deformities:**

❖ **Congenital Deformities**

- i. CTEV
- ii. CDH
- iii. Torticollis
- iv. Scoliosis
- v. Flat foot
- vi. Vertical talus
- vii. Hand anomalies- syndactyly, polydactyly and ectrodactyly
- viii. Arthrogryposis multiplex congenita (amyoplasia congenita)
- ix. Limb deficiencies- Amelia and Phocomelia, Klippel feil syndrome, osteogenesis imperfecta (fragile ossium)
- x. Cervical rib

❖ **Acquired Deformities**

- i. Acquired Torticollis
- ii. Scoliosis

- iii. Kyphosis
- iv. Lordosis
- v. Genu varum
- vi. Genu valgum
- vii. Genu recurvatum
- viii. Coxa vara
- ix. Pes cavus
- x. Hallux rigidus
- xi. Hallux valgus
- xii. Hammer toe
- xiii. Metatarsalgia

❖ **Disease of Bones and Joints**

- Causes
- Clinical features
- Complications
- **Management- medical and surgical of the following conditions:**

❖ **Infective conditions:**

- i. Osteomyelitis (Acute / chronic)
- ii. Brodie's abscess
- iii. TB spine and major joints like shoulder, hip, knee, ankle, elbow etc.

❖ **Arthritic conditions:**

- i. Pyogenic arthritis
- ii. Septic arthritis
- iii. Syphilitic infection of joints

❖ **Bone Tumors:**

- Classification
- Clinical features
- **Management - medical and surgical of the following tumors:**

- i. Osteoma
- ii. Osteosarcoma
- iii. Osteochondroma
- iv. Enchondroma
- v. Ewing's sarcoma
- vi. Giant cell tumor
- vii. Multiple myeloma
- viii. Metastatic tumors

❖ Perthes disease, Slipped Capital Femoral Epiphysis and Avascular Necrosis

❖ **Metabolic Bone Diseases:** Rickets. Osteomalacia, Osteopenia, Osteoporosis

❖ **Inflammatory and Degenerative Conditions:**

- Causes
- Clinical feature
- Complications
- Deformities
- Radiological features
- **Management- conservative and surgical for the following conditions:**
  - i. Osteoarthritis
  - ii. Rheumatoid arthritis
  - iii. Ankylosing spondylitis
  - iv. Gouty arthritis
  - v. Psoriatic arthritis
  - vi. Hemophilic arthritis
  - vii. Still's disease (juvenile rheumatoid arthritis)
  - viii. Charcot's joints
  - ix. Connective Tissue Disorders- Systemic Lupus Erythematosus, Scleroderma,
  - x. Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease (MCTD)

**Unit V: Neuro-vascular & Neuromuscular diseases**

**10 Hours**

- ❖ Definition
- ❖ Causes
- ❖ Clinical feature
- ❖ Complications
- **Management (Multidisciplinary approach) medical and surgical of the following conditions:**
  - i. Cerebral palsy
  - ii. Poliomyelitis
  - iii. Spinal Dysraphism
  - iv. Leprosy
- ❖ **Soft Tissue Injuries**
  - Define terms such as sprains, strains, contusion, tendinitis, rupture, tenosynovitis, tendinosis, bursitis
  - Mechanism of injury of each
  - Clinical features
  - **Managements- conservative and surgical of the following soft tissue injuries:**
    - i. Meniscal injuries of knee
    - ii. Cruciate injuries of knee

- iii. Medial and lateral collateral injuries of knee
- iv. Lateral ligament of ankle
- v. Wrist sprains
- vi. Strains- quadriceps, hamstrings, calf, biceps, triceps etc.
- vii. Contusions- quadriceps, gluteal, calf, deltoid etc.
- viii. Tendon ruptures-Achilles, rotator cuff muscles, biceps, pectorals etc.

❖ **Hand Injuries**

- Mechanism of injury
- Clinical features
- Management of the following:
  - i. Crush injuries
  - ii. Flexor and extensor injuries
  - iii. Burn injuries of hand

❖ **Amputations**

- Definition
- Levels of amputation of both lower and upper limbs, indications, complications

Unit VI: Recent advances in Orthopaedics 10 hours

1. Electrotherapy
2. Manual therapy
3. Surgeries
4. Rehabilitation.

**Suggested Reading**

- 1.J. Maheshwari, Essential Orthopaedics 4<sup>th</sup> edition, Jaypee Brothers Medical Publishers (P) Ltd, 2011, ISBN: 978-8184655421
- 2.S. Brent Brotzman. Clinical Orthopaedic Rehabilitation: An Evidence-Based Approach 3<sup>rd</sup> edition, Robert C. Manske, Mosby Publishers, 2011, ISBN: 978-0323055901
- 3.John Ebnezar. Text Book of Orthopaedics 4<sup>th</sup> edition, Boydell & Brewer Ltd, 2010, ISBN: 9788184487442
- 4.David L. Hamblen, A.H.R.W. Simpson, John C. Adams. Adam's Outline of Fractures, including Joint Injuries 12<sup>th</sup> edition, Elsevier Health Sciences, 2007, ISBN: 9780443102974
- 5.Louis Solomon, David Warwick, SelvaduraiNayagam. Apley's Concise System of Orthopaedics& Fractures 9<sup>th</sup> edition, CRC Press, 2010, ISBN: 9780340942055



<b>Name of The Course</b>	<b>General Surgery Including Burns, Plastic Surgery and Obstetrics And Gynecology</b>			
<b>Course Code</b>	<b>BPHY5002</b>			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	4	0	0	4

### Course Objectives

#### The student is expected to study:

- Principles of surgical examination.
- Brief description of various types of Surgeries, pathologies its etiology, clinical features and the management.
- The burns & plastic surgery patients and with amputation.
- The various common gynecological and obstetrics conditions and procedures.

### Course Outcomes

<b>CO1</b>	To demonstrate knowledge and understanding of common surgical problems and the techniques used for assessments.
<b>CO2</b>	To demonstrate an understanding of surgical treatments in vascular disorders and the surgeries related to abdominal areas.
<b>CO3</b>	To utilize basic understanding of burns patient and different type of plastic surgery, Ophthalmological and ENT related conditions.
<b>CO4</b>	To utilize the basic anatomy for understanding and learning about Obstetrics and Gynecological conditions.
<b>CO5</b>	To utilize the knowledge of anatomy and physiology to understand the female reproductive organs, the surgeries related to it, the reproductive health, and the surgical approaches.
<b>CO6</b>	To Demonstrate the recent approach towards surgery.

### Continuous Assessment Pattern

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test(CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
10	20	70	100

### Course Content:

<b>Unit I: Introduction to General Surgery</b>	<b>10 lectures</b>
<ul style="list-style-type: none"> <li>❖ Surgery – definition, Reasons for Surgery; Anaesthesia and its types, its effects and complication on the patient.</li> <li>❖ Brief description of Radiologic Diagnostic procedures, Endoscopy – types, Biopsy – uses and types. Overview and Drainage systems and tubes used in Surgery.</li> <li>❖ Fluid, Electrolyte and Acid-Base disturbances – diagnosis and management ; Nutrition in the surgical patient ;</li> <li>❖ Wound healing – definition, cause, clinical features, phases of wound healing, clinical management of wounds, factors affecting wound healing.</li> <li>❖ Scars – types and treatment.</li> <li>❖ Hemostasis – components, factors affecting bleeding during surgery. Transfusion therapy in surgery – blood components, complications of transfusion ;</li> <li>❖ Definition, Indication, various Incisions and its types, indications, clinical presentation and Complications following Common operations like Cholecystectomy, Colostomy, Ileostomy, Gastrectomy, Hernias, Appendicectomy Mastectomy, Nephrectomy, Prostatectomy. General Post – Operative Complications and its management.</li> </ul>	
<b>Unit II: Chest wall and vascular disorders and surgeries</b>	<b>12 lectures</b>
<ul style="list-style-type: none"> <li>❖ Thoracic surgeries – Thoracotomy – Definition, Types of Incisions with emphasis to the site of incision, muscles cut and complications. Lung surgeries: Pneumonectomy, Lobectomy, segmentectomy – Indications, Physiological changes and Complications; Thoracoplasty, Pleurectomy, Pleurodesis and Decortication of the Lung.</li> <li>❖ Cardiac surgeries – An overview of the Cardio-Pulmonary Bypass Machine – Extracardiac Operations, Closed Heart surgery, Open Heart surgery. Transplant Surgery – Heart, Lung – Indications, Physiological changes and Complications.</li> </ul>	

- ❖ Chest trauma - Causes, Clinical Presentation, Diagnosis and treatment of the following Thoracic Trauma situations – Airway obstruction, Pneumothorax, Hemothorax, Cardiac Tamponade, Tracheobronchial disruption, Aortic disruption, Diaphragmatic disruption, Esophageal disruption, Cardiac and Pulmonary Contusions. Disorders of the Chest Wall, Lung and Mediastinum
- ❖ Diseases of the Arteries and Veins : Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases : Arteriosclerosis, Atherosclerosis, Aneurysm, Buerger's disease, Raynaud's Disease, Thrombophlebitis, Deep Vein Thrombosis, Pulmonary Embolism, Varicose Veins.

### **Unit III: Burn, ENT, and ophthalmology and oncology**

#### **10 lectures**

- ❖ Burn: Definition, Classification, Causes, Prevention, Pathological changes, Complications, Clinical Features and Management. Skin Grafts – Types, Grafting Procedures, Survival of Skin Graft ; Flaps – Types and uses of Flaps.
- ❖ ENT: Common problems of ear, otitis media, Otosclerosis, functional achonia and deafness, management facial palsy classification, medical and surgical management of lower motor neuron type of facial palsy.
- ❖ Ophthalmology: brief description of various Ophthalmologic surgical conditions
- ❖ Surgical Oncology – Cancer – definition, types, clinical manifestations of cancer, Staging of Cancer, surgical procedures involved in the management of cancer.

### **Unit IV: Obstetrics and Gynecology 10 lectures**

- ❖ Brief description of Anatomy and physiology of the female reproductive organs.
- ❖ Hormonal disorders of females
- ❖ Pregnancy - Diagnosis of pregnancy, Abortion, Physiological changes during pregnancy, High risk pregnancy, prenatal common complications –investigation and management, Musculoskeletal disorders during pregnancy, Multiple child birth, Normal labor
- ❖ Child birth complications, investigation and management
- ❖ Normal puerperium, lactation and importance of post-natal exercises , antenatal care exercise
- ❖ Family planning.

### **Unit-V:Obstetrics and Gynecology disorders 10 lectures**

- ❖ Medical termination of pregnancy
- ❖ Infection of female genital tract including sexually transmitted diseases, low backache
- ❖ Prolapse of uterus and vagina
- ❖ Principle of common gynaecological operations – hysterectomy, D&C, D&E, PAP's smear
- ❖ Menopause: Its effect on emotions and musculoskeletal system
- ❖ Surgical procedures involving child birth.
- ❖ Definition, Indications and Management of the following surgical procedures – pelvic repair, caesarian section, nephrectomy, Hysterosalphyngography, Dilatation and Curettage, Laproscopy, Colposcopy, Hysterectomy
- ❖ Carcinoma of female reproductive organs – surgical management in brief Mastectomy – Simple, radical. Hysterectomy.
- ❖ Incontinence – Types, Causes, Assessment and Management.
- ❖

### **Unit-VI: Recent Developments 8 lectures**

- ❖ Recent Advancements in surgery
- ❖ Recent radiological inventions in assessment

### **Suggested Reading**

1. Charles V. Mann, R. C. G. Russell. Bailey & Love's Short Practice of Surgery revised 21<sup>st</sup> edition, Charles V. Mann, R. C. G. Russell, Chapman & Hall, 1992, ISBN: 978-0442315849
2. S. Das. A Concise Text Book of Surgery 6<sup>th</sup> edition, Dr. Somen Das Publishers, 2008, ISBN: 978-8190568128
3. lecture notes on surgery by christopher
4. HiralalKonar. Dc Dutta's Text Book of Obstetrics 7<sup>th</sup> revised edition, Jaypee Brothers Medical Publishers, 2014, ISBN: 978-9351520672
5. A. K. Nan. Undergraduatessurgery 5th reprint, Academic Publishers, 2004, ISBN: 9788186358587
6. Margaret Polden, Jill Mantle. Physiotherapy in Obstetrics & Gynecology 1st edition, Butterworth-Heinemann, 1990, ISBN: 978-0750600163

Name of The Course	BPHY5003			
Course Code	General Medicine, Paediatrics & psychiatry			
Prerequisite				
Co-requisite				
Anti-requisite				
	L	T	P	C
	4	0	0	4

### Course Objectives

The graduate is expected to study:

- The nutritional and metabolic diseases
- The nutrition and immunization process and the clinical presentation of various pathologies in a pediatric patient
- The disorders of geriatrics

### Course Outcomes

CO1	To relate the concept of various nutritional and metabolic diseases.
CO2	To interpret etiology, pathology, clinical features and treatment methods for various medical conditions
CO3	To relate the concept of growth, development, nutrition and immunization in children.
CO4	To interpret rheumatism and cardio-pulmonary ailments in paediatric patient
CO5	To interpret common disorders in a psychiatry patient.
CO6	To interpret etiology, pathology, clinical features and treatment methods for coronavirus.

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

### Course Content:

<b>Unit I: Infection, Poisoning, and Food and nutrition</b> <b>HOURS 12</b>
<b>1. Infection : Effects of Infection on the body – Pathology – source and spread of infection – vaccinations – generalized infections – rashes and infection – food poisoning and gastroenteritis</b>

– sexually transmitted diseases – HIV infections and Aids.

**2. Poisoning: Clinical features – general management – common agents in poisoning – pharmaceutical agents – drugs of misuse – chemical pesticides – Envenomation.**

**3. Food and Nutrition: Assessment – Nutritional and Energy requirements; Deficiency diseases – clinical features and treatment; Protein – Energy Malnutrition: Clinical features and treatment; Obesity and its related disorders: Causes – Complications – benefits of weight loss – management of Obesity – diet, exercise and medications.**

**Unit II:Endocrine diseases and disease of blood.**

**HOURS 10**

1. Endocrine diseases: Common presenting symptoms of Endocrine disease – common classical disease presentations, clinical features and its management; Diabetes Mellitus: Etiology and pathogenesis of diabetes – clinical manifestations of the disease – management of the disease – Complications of diabetes.
2. Diseases of the blood: Examinations of blood disorders – Clinical manifestations of blood disease; Anemia – signs and symptoms – types and management ; Hemophilia - Cause – clinical features severity of disease – management – complications due to repeated hemorrhages – complications due to therapy.

**Unit III: Diseases of the digestive system and Diseases of the Skin.**

**HOURS 10**

1. Diseases of the digestive system : Clinical manifestations of gastrointestinal disease – Etiology, clinical features, diagnosis, complications and treatment of the following conditions : Reflux Oesophagitis, Achlasia Cardia, Carcinoma of Oesophagus, GI bleeding, Peptic Ulcer disease, Carcinoma of

<p>Stomach, Pancreatitis, Malabsorption Syndrome, Ulcerative Colitis, Peritonitis, Infections of Alimentary Tract ; Clinical manifestations of liver diseases - Aetiology, clinical features, diagnosis, complications and treatment of the following conditions : Viral Hepatitis, Wilson's Disease, Alpha1-antitrypsin deficiency, Tumors of the Liver, Gallstones, Cholecystitis.</p> <p>2. Diseases of the Skin: Examination and clinical manifestations of skin diseases; Causes, clinical features and management of the following skin conditions: Leprosy, Psoriasis, Pigmentary Anomalies, Vasomotor disorders, Dermatitis, Coccal and Fungal Parasitic and Viral infections</p>
<p><b>Unit IV: Pediatrics</b> <span style="float: right;"><b>HOURS</b></span> <b>10</b></p>
<p>Pediatrics : Problems and management of LBW infants, Perinatal problems and management, Congenital abnormalities and management, Respiratory conditions of childhood, Cerebral Palsy</p> <p>❖ causes, complications, clinical manifestations, treatment ; Spina Bifida – management and treatment, Epilepsies – types, diagnosis and treatment; Recognizing developmental delay, common causes of delay ; Orthopedic and Neuromuscular disorders in childhood, clinical features and management ; Sensory disorders – problems resulting from loss of vision and hearing ; Learning and behavioural problems – Hyperactivity, Autism, Challenging behaviours, Educational delay, The Clumsy Child.</p>
<p><b>Unit V: Psychiatric Disorders</b> <span style="float: right;"><b>HOURS 10</b></span></p>
<p>Psychiatric Disorders: Classifications, Causes, Clinical manifestations and treatment methods used in Psychiatry. Modalities of psychiatric treatment, Psychiatric illness and physiotherapy, Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illnesses -. Anxiety neurosis, Depression, Obsessive compulsive neurosis, Psychosis, Maniac-depressive psychosis, Post-traumatic stress disorder, Psychosomatic</p>

reactions: Stress and Health, theories of Stress – Illness.

Etio-pathogenesis, manifestations, and management of psychiatric illness

- a. Drug dependence and alcoholism,
- b. Somatoform and Dissociate Disorders – conversion reactions, Somatization, Dissociate Amnesia, and Dissociate Fugue,
- c. Personality disorders
- d. Child psychiatry - manifestations, and management of childhood disorders -attention deficit syndrome and behavioral disorders.
- e. Geriatric psychiatry.

**Unit VI: Coronavirus** **HOURS.**  
**8**

1. Coronavirus : Clinical manifestation, etiology and treatment.
2. Combination of medication for symptomatic treatment for coronavirus.
  - ❖ Combination of medication for preventive treatment of coronavirus for frontline doctors.

### Suggested Reading

1. Christopher Haslett, Sir Stanley Davidson. Davidson's Principles & Practice of Medicine 18<sup>th</sup> edition, Churchill Livingstone, 1999, ISBN: 978-0443059445
2. O.P. Ghai, Piyush Gupta, V.K. Paul. Ghai's Essential Pediatrics 6th edition revised & enlarged, CBS Publishers, ISBN: 9788123911632
3. Dennis L. Kasper, Eugene Braunwald, Stephen Hauser, Dan Longo, J. Larry Jameson, Anthony S. Fauci. Harrison's Principles of Internal Medicine 16<sup>th</sup> edition, McGraw-Hill Professional, 2004, ISBN: 978-0071402354
4. Suraj Gupte. The Short Textbook of Pediatrics 11<sup>th</sup> edition, 2009, ISBN: 978-81-8448-469-4
5. K.V. Krishna Das. Text Book of Medicine (vol. I & II) 5th edition, Jaypee Brothers Medical Publishers (P) Ltd, 2008, ISBN: 978-81-8448-388-8

6. Margaret Polden, Jill Mantle. Physiotherapy in Obstetrics & Gynecology 1st edition, Butterworth-Heinemann, 1990, ISBN: 978-0750600163

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

Name of The Course	Community Medicine			
Course Code	BPHY 5004			
Prerequisite				
Co-requisite				
Anti-requisite				
	L	T	P	C
	4	0	0	4

### Course Objectives

#### The student is expected to study:

- To introduce the concept of health care and management issues in Health Services.
- To help them in assuming a leadership role in their profession and assume the responsibility of guidance.
- To help them assume wider responsibilities at all levels of health services.
- To help them in improving their performance through better understanding of the health services at all the levels of community.

### Course Outcomes

CO1	Infer healthy lifestyles in the individual and the community level to prevent environmental degradation and to promote social harmony.
CO2	Demonstrate patient-centred comprehensive primary health care including referral, continuing care and follow-up.
CO3	Apply the basic epidemiological principles to investigation of diseases, outbreaks, health promotion and disease prevention
CO4	Identify the health needs of populations and population subgroups through planning, intervention, monitoring and evaluation
CO5	Infer to health systems' performance as a member of the health team in the generation and efficient utilization of human and logistic resources.
CO6	Acquire the Skills of the Clinical Examination of Pelvic floor.

### Course Content:

<b>Unit-I : Health, Disease &amp; Education</b>	<b>12 hours</b>
Health & Disease : <ul style="list-style-type: none"> <li>• Definitions</li> <li>• Concepts</li> <li>• Dimensions and Indicators of Health</li> <li>• Concept of well-being</li> <li>• Spectrum and Determinants of Health</li> <li>• Concept and natural history of Disease</li> <li>• Concepts of disease control and prevention</li> <li>• Modes of Intervention</li> <li>• Population Medicine</li> <li>• The role of socio-economic and cultural environment in health and disease</li> </ul> Health Education : <ul style="list-style-type: none"> <li>• Concepts</li> <li>• Aims and objectives</li> <li>• Approaches to health education</li> <li>• Models of health education</li> <li>• Contents of health education</li> <li>• Principles of health education</li> </ul> Practice of health education.	
<b>Unit-II Types of Health</b>	<b>10 hours</b>
Mental Health : <ul style="list-style-type: none"> <li>• Characteristics of a mentally healthy person</li> <li>• Types of mental illness</li> <li>• Causes of mental ill health</li> <li>• Prevention</li> <li>• Mental health services</li> <li>• Alcohol and drug dependence</li> <li>• Emphasis on community aspects of mental health</li> <li>• Role of Physiotherapist in mental health problems such as mental retardation.</li> </ul> Occupational Health :	



<ul style="list-style-type: none"> <li>• Occupational environment</li> <li>• Occupational hazards</li> <li>• Occupational diseases</li> <li>• Prevention of occupational diseases</li> <li>• Social security and other measures for the protection from occupational hazard accidents and diseases</li> <li>• Details of compensation acts</li> </ul>	
Nutrition & Health :	
<ul style="list-style-type: none"> <li>• Classification of foods</li> <li>• Nutritional profiles of principal foods</li> <li>• Nutritional problems in public health</li> <li>• Community nutrition programmes</li> </ul>	
Environment & Health :	
<ul style="list-style-type: none"> <li>• Components of environment</li> <li>• Water and air pollution and public health</li> <li>• Pollution control</li> <li>• Disposal of waste</li> <li>• Medical entomology</li> </ul>	
<b>Unit III: Epidemiology</b>	<b>10 hours</b>
Epidemiology :	
<ul style="list-style-type: none"> <li>• Definition and scope</li> <li>• Principles of Epidemiology and Epidemiological methods</li> <li>• Components and Aims</li> <li>• Basic measurements and methods</li> <li>• Uses of Epidemiology</li> <li>• Infectious disease epidemiology</li> <li>• Dynamics and modes of disease transmission</li> <li>• Host defenses and Immunizing agents</li> <li>• Hazards of Immunization</li> <li>• Disease prevention and control</li> <li>• Disinfection, Screening for Disease: Concept of screening, Aims and Objectives, uses and types of screening</li> </ul>	
Epidemiology of Communicable Disease :	
<ul style="list-style-type: none"> <li>• Respiratory infections</li> <li>• Intestinal infections</li> <li>• Arthropod-borne infections</li> <li>• Zoonoses, Surface infections</li> <li>• Hospital acquired infections</li> </ul>	
Epidemiology of non-communicable diseases and conditions :	
<ul style="list-style-type: none"> <li>• Cardio vascular diseases</li> <li>• Coronary heart disease</li> </ul>	

<ul style="list-style-type: none"> <li>• Hypertension</li> <li>• Stroke</li> <li>• Rheumatic heart disease</li> <li>• Cancer</li> <li>• Diabetes</li> <li>• Obesity</li> <li>• Blindness</li> <li>• Accidents and Injuries</li> </ul>	
<b>Unit IV: Health Planning</b>	<b>10 hours</b>
Demography & Family planning :	
<ul style="list-style-type: none"> <li>• Demographic cycle</li> <li>• Fertility</li> <li>• Family planning-objectives of national family planning programme and family planning methods</li> <li>• General idea of advantage and disadvantages of the methods</li> </ul>	
Preventive Medicine in Obstetrics, Paediatrics & Geriatrics :	
<ul style="list-style-type: none"> <li>• MCH problems</li> <li>• Antenatal, Intranatal and post-natal care</li> <li>• Care of children</li> <li>• Child health problems</li> <li>• Rights of child and National policy for children</li> <li>• MCH services and indicators of MCH care</li> <li>• Social welfare programmes for women and children</li> <li>• Preventive medicine and geriatrics</li> </ul>	
Hospital Waste Management :	
<ul style="list-style-type: none"> <li>• Sources of hospital waste</li> <li>• Health hazards</li> <li>• Waste management</li> </ul>	
Disaster Management:	
<ul style="list-style-type: none"> <li>• Natural and man-made disasters</li> <li>• Disaster impact and response</li> <li>• Relief phase</li> <li>• Epidemiologic surveillance and disease control</li> <li>• Nutrition</li> <li>• Rehabilitation</li> <li>• Disaster preparedness</li> </ul>	
<b>Unit V: Health Management &amp; Programmes</b>	<b>10 hours</b>
Public Health Administration:	



- Overview of the health administration set up at Central and state levels
- National health programme-highlighting the role of social, economic and cultural factors in the implementation of the national programmes
- Health problems of vulnerable groups-pregnant and lactating women, infants and pre-school children, occupational groups

#### Health Programmes in India :

- Vector borne disease control programme
- National leprosy eradication programme
- National tuberculosis programme
- National AIDS control programme
- National programme for control of blindness
- Iodine deficiency disorders (IDD) programme
- Universal Immunisation programme
- Reproductive and child health programme
- National cancer control programme
- National mental health programme
- National diabetes control programme
- National family welfare programme
- National sanitation and water supply programme
- Minimum needs programme

#### Unit VI: Socio-Economical & Cultural issues related to morbidity owing to physical disability 8 hours

- Health Problem in Vulnerable Groups:
- Pregnant & Lactating Women, Pelvic floor dysfunction, Urinary incontinence
- Pre-term Babies with high risk, Infants & Pre-School Children-Brain Damage, During Birth Injury.

5. Community Medicine with Recent Advances, Jaypee Brothers Medical Publisher

<b>Name of The Course</b>	Health Promotion and Fitness			
<b>Course Code</b>	BPHY7003			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	1	0	0	1

#### Course Objectives

##### The student is expected to study:

1. Students will understand the importance of wellness and fitness principles as they relate to better health.
2. Students will be exposed to a variety of activities providing them the opportunity to apply and utilize knowledge in risk reduction.

#### Course Outcomes

<b>CO1</b>	Conduct assessments of fitness, well-being for clients and effectively communicate assessment results.
<b>CO2</b>	Prescribe appropriate physical activity and fitness programs to enhance health, fitness, and well-being of society.

#### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

#### Course Content:

<b>Unit I: Introduction</b>	<b>7 Hours</b>
<ul style="list-style-type: none"> <li>• Prevention practice: a holistic perspective for physiotherapy</li> <li>• Defining Health, Predictions of Health Care, Comparing Holistic Medicine and Conventional Medicine, Distinguishing Three Types of Prevention Practice.</li> <li>• Healthy People</li> </ul>	

#### Suggested Reading

1. Park's Textbook of Preventive & Social Medicine - K. Park
2. Textbook of Preventive & Social Medicine - P.K. Mahajan & M.C. Gupta
3. Essential of Community Medicine - Baride and Kulkarni
4. Textbook of Community Medicine Preventive and Social Medicine 4<sup>th</sup> edition, CBS Publishers & Distributors Pvt. Ltd., eISBN: 9788123927220

<ul style="list-style-type: none"> <li>Definition of healthy people, Health education Resources, Physiotherapist role for a healthy community.</li> </ul>
Unit-2 Key concepts of fitness <span style="float: right;">8 hours</span>
<ul style="list-style-type: none"> <li>Defining &amp; Measuring Fitness, Assessment of Stress with a Survey, Visualizing Fitness, Screening for Mental and Physical Fitness, Body Mass Index calculations.</li> <li>Fitness training</li> <li>Physical Activities Readiness Questionnaire, Physical Activities Pyramid. Exercise Programs</li> <li>Evidence-Based Practice.</li> </ul>

### Suggested Reading

- Manoj Sharma, Theoretical foundation of health education and health promotion, Third Edition
  - Tom R. Thomas, Fitness and Health Promotion, Reference Book (s)
- Nllie M. Cyr, Health Promotion Disease prevention and Exercise Epidemiology

<b>Name of The Course</b>	Diagnostic Imaging For Physiotherapist			
<b>Course Code</b>	BPHY5006			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	1	0	0	1

### Course Objectives

To study

- various diagnostic imaging procedures.
- To study the importance of nuclear medicine.

### Course Outcomes

<b>CO1</b>	To illustrate the indications and implications of commonly used diagnostic imaging tests.
<b>CO2</b>	To demonstrate the common diagnostic and therapeutic imaging procedures.

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
50	00	00	50

### Course Content:

<b>Unit-1: Introduction to Diagnostic imaging</b> <b>8. HOURS</b>
<ul style="list-style-type: none"> <li>History, how a Medical Image Helps, What Imaging Studies Reveal related to</li> <li>Radiography (X-rays), Fluoroscopy, Computed Tomography, MRI, Ultrasound Endoscopy.</li> </ul> <p><b>Procedure and importance of Ultrasound, Endoscopy</b></p> <ul style="list-style-type: none"> <li>Indications and contraindications</li> <li>Equipment used</li> <li>How it helps in diagnosis</li> <li>The Findings</li> <li>Benefits versus Risks and Costs.</li> </ul>
<b>Unit II: Radiography, Mammography and nuclear medicine</b> <b>7 HOURS</b>
<ul style="list-style-type: none"> <li>Equipment components,</li> <li>Procedures for Radiography &amp; Mammography</li> <li>Benefits versus Risks and Costs</li> <li>Equipment used for Nuclear Medicine.</li> <li>Indications and Contra-indications</li> <li>How it helps in diagnosis.</li> <li>Benefits versus Risks and Costs.</li> </ul>

### Suggested Reading

- Livingstone, ISBN 978-94-009-8785-2
- James Swain Kenneth Bush Juliette Brosing. Diagnostic Imaging for Physical Therapists, Saunders, 1st Edition, 2008 ISBN: 9781416029038
- G Balachandran. MRI Spine in Low Backache Made Easy: for the General Practitioner, 1/e, 2012, Jaypee Brothers, ISBN: 9789350257142
- Govind B Chavan. MRI Made Easy (for Beginners), 2/e, 2013, Jaypee Brothers, ISBN: 9789350902707
- Joseph H Introcaso. Musculoskeletal Ultrasound. 3/e, 2016, Jaypee Brothers, ISBN: 9789351529330

<b>Name of The Course</b>	<b>Clinical education (Evaluation Methods &amp; Outcome Measures (Lab</b>			
<b>Course Code</b>	BPHP5010			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	0	0	8	4

### Course Objectives

The student is expected to study:

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

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

### Course Outcomes

CO1	Demonstrate an understanding of patient's problem and chief complaints.
CO2	Demonstrate an understanding of orthopaedic assessment.
CO3	Illustrate the clinical special tests for various musculoskeletal conditions.
CO4	Develop knowledge of various musculoskeletal conditions.
CO5	Develop knowledge of handling different cases.
CO6	Choose recent advancement in the field.

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
50	00	00	50

Course Content:

<b>Unit I: General Assessment</b>
<ul style="list-style-type: none"> <li>Demographics</li> <li>History taking</li> <li>Motor assessment</li> <li>Sensory assessment</li> </ul>
<b>Unit II: Orthopaedic assessment</b>
<ul style="list-style-type: none"> <li>Pain assessment</li> <li>Motor assessment: muscle strength testing, ROM, muscle flexibility testing, end-feel</li> <li>Sensory assessment: reflexes, sensations</li> </ul>

- Gait
- Balance
- Posture

### Unit III: Special tests

- upper limb: shoulder, elbow, wrist & hand
- lower limb: hip, knee, ankle & foot
- spine
- upper limb tension tests
- lower limb tension tests

### Unit IV: Special areas

- low back pain
- shoulder impingement
- tennis elbow
- osteoarthritis
- ankle sprain

### Unit V: Case studies

- knowledge of various musculoskeletal conditions

**Unit VI: Recent trends in the field** **8 hours**

Discussion of high impact article related to clinical physiotherapy

### Suggested Reading

1. Orthopaedic physical Assessment by David Magee, 6<sup>th</sup> edition, Elsevier India (2014)

2. Textbook of Orthopaedics by John Ebnezar, Jaypee Brothers Medical Publishers

<b>Name of The Course</b>	<b>PT in Ortho and Sports</b>			
<b>Course Code</b>	<b>BPHY 6001</b>			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	4	0	0	4

### Course Objectives

#### The student is expected to study:

- The fractures and deformities of upper and lower limb
- The spinal deformities
- The congenital deformities
- Amputations

### Course Outcomes

<b>CO1</b>	To be able to identify disabilities due to various musculoskeletal dysfunction
<b>CO2</b>	To plan and set treatment goals
<b>CO3</b>	To apply the skills gained in exercise therapy in clinical situation
<b>CO4</b>	To apply the skills gained in electro therapy in clinical situations
<b>CO5</b>	To apply the skills of physiotherapy in different sports condition
<b>CO6</b>	To acquire the skills of the clinical examination of sports injury

### Continuous Assessment Pattern

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test(CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
10	20	70	100

### Course Content:

<b>Unit-I : Fractures</b>	<b>12 hours</b>
<ul style="list-style-type: none"> <li>• Types,classification,signsandsymptoms,complications</li> <li>• Fracturehealing-factors affecting fracture healing.</li> </ul>	

- Principles of fracture management - reduction - open and closed, immobilization-sling, cast, brace, slab, traction-manual, mechanical, skin, skeletal, lumbar and Cervical traction, external fixation, functional cast bracing.
- PT management in early and late complications of Fracture
- Physiotherapy assessment and management in fracture cases
- PT assessment and management of upper limb fractures and dislocations. PT assessment and management of lower limb fractures and dislocations including pelvis. PT assessment and management spinal fractures.
- Principles of various schools of thought in manual therapy.(Briefly Maitlandand Mckenzie).

### Unit II: Inflammatory Condition & Deformities 10 hours

#### Degenerativeandinflammatoryconditions:

- Definition,signsandsymptoms,clinicalfeatures, 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, Periarthritic shoulder.

#### Infective conditions:

- Definition, signs and symptoms, clinical features, pathophysiology, radiological features, medical, surgical management.
- Describe PT assessment and management for following conditions – Osteomyelitis – acute and chronic, Septic arthritis, pyogenic arthritis, TB spine and major joints - knee and hip.

#### Deformities

- Causes, signs and symptoms, radiological features, medical and surgical management.
- Describe the PT. assessment and management of the following conditions: Congenital: CTEV, CDH, Torticollis, pes planus, pes cavus and other common deformities. Acquired:scoliosis,kyphosis,coxavara,genuvarum,valgumandrecurvatum.
- Postural abnormalities of spinal column, clinical features, deformities, medical surgical and PT management.

**Unit III: Neurological Conditions & Amputation****10 hours****Neurological Condition**

- Cerebral palsy: Definition, etiology, classification, clinical features, complications, deformities, medical and surgical management and home program with special emphasis on carrying techniques. PT assessment and management after surgical corrections of the following neurological conditions:
  1. Cerebral Palsy
  2. Poliomyelitis
  3. Leprosy
  4. Spinal conditions (Cervical spondylosis, Lumbar spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacro-iliac joint dysfunction, Sacralisation, Lumbarisation, Intervertebral disc prolapse, Coccydynia, Spina bifida-occulta.)

**Spinal Traction**

- Effects of spinal traction, types of traction, modes of application, indications for spinal traction, contraindications, precautions, limitations of traction.

**Amputations:**

- 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.

**Unit IV: Orthopedics Surgeries for Upper-Limb 10 hours****Osteoporosis**

- causes, predisposing factors, investigations and treatment.

**Orthopedic surgeries:**

- Pre and post-operative PT assessment, goals, precautions and PT management of following

surgeries such as: Arthrodesis, Osteotomy, Arthroplasty- partial and total - Excision arthroplasty, excision arthroplasty with implant, interpositional arthroplasty and total replacement; Tendon transplant, Soft tissue release- tenotomy, myotomy, lengthening; Arthroscopy, Spinal stabilization, Re-attachment of limbs, External fixators, Synovectomy.

**Shoulder Joint**

- Shoulder instabilities, TOS, RSD, Impingement syndrome-conservative and post-operative PT management. Total shoulder replacement and Hemi replacement. - Post operative PT management.
- AC joint injuries - rehabilitation. Rotator cuff tears-conservative and surgical repair. Subacromial decompression-Post operative PT management.

**Elbow and forearm**

- Excision of radial head - Post operative PT management. Total elbow arthroplasty- Post operative PT management.

**Wrist and Hand**

- Total wrist arthroplasty. Repair of ruptured extensor tendons. Carpal tunnel syndrome. Flexor and extensor tendon lacerations- Postoperative PT management.

**Unit V: Orthopedics surgeries for Lower Limbs 6Hrs****Hip**

- Joint surgeries- hemi and total hip replacement - Post operative PT management Tendonitis and bursitis. -Management.

**Knee**

- Lateral retinacular release, chondroplasty- Postoperative management. Realignment of extensor mechanism. ACL and PCL reconstruction surgeries - Post operative rehabilitation. Meniscectomy and meniscal repair - Post operative management. Plica syndrome, patellar dysfunction and Hoffa's syndrome- conservative management. TKR- rehabilitation protocol. Patellar tendon ruptures and Patellectomy-rehabilitation.

**Ankle and foot**

- Ankle instability. Ligamentous tears-Post operative management

**Introduction to Bio-Engineering**

- Classification of Orthoses and prostheses;
- Biomechanical principles and designing of orthotic and prosthetic application;

**Sports Physiotherapy:**

- Physical fitness.
- Soft tissue injuries
- Soft tissue healing

**Collateral and Cruciate injuries of knee. Meniscal injuries of knee Supraspinatus and Bicipital tendonitis. Pre-patellar and Sub-acromial**

**Unit VI: Sports Medicine** **4**  
**hours**

- Introduction and Classification of Sports Injury
- Prevention of Sports Injury
- Investigation and Assessment in Sports Injury

<b>Name of The Course</b>	<b>BPHY6002</b>			
<b>Course Code</b>	<b>Physiotherapy in general medicine and surgery</b>			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	4	0	0	4

**Course Objectives****The student is expected to study:**

1. Acquire knowledge of rationals of basic investigative approaches in the medical system and surgical intervention, regimes in general surgeries.
2. Execute effective physiotherapeutic measures (with appropriate clinical reasoning) and exercise, conditioning in general medical and surgical conditions.
3. Acquire the knowledge of various conditions where physiotherapy plays a vital role in the rehabilitation.

**Course Outcomes**

<b>CO1</b>	<b>Understand the importance of pre and post op physiotherapy in rehabilitation</b>
<b>CO2</b>	<b>Demonstrate an understanding of surgical treatments and the surgeries related to abdominal areas including physiotherapy intervention</b>
<b>CO3</b>	<b>Demonstrate a basic understanding of burn management and role of physiotherapy in reconstructive surgery.</b>
<b>CO4</b>	<b>Utilize the knowledge of anatomy and physiology to understand the female reparoductive organs and the surgeries related to it, physiotherapy approaches and role of exercises in various stages of pregnancy</b>
<b>CO5</b>	<b>Utilize the role and knowledge of physiotherapy in various medical conditions including geriatrics.</b>
<b>CO6</b>	<b>Outline the recent advancements in surgical processes and tools.</b>

**Suggested Reading**

- J. Maheshwari, Essential Orthopaedics 4<sup>th</sup> edition, Jaypee Brothers Medical Publishers (P) Ltd, 2011, ISBN: 978-8184655421
- S. Brent Brotzman. Clinical Orthopaedic Rehabilitation: An Evidence-Based Approach 3<sup>rd</sup> edition, Robert C. Manske, Mosby Publishers, 2011, ISBN: 978-0323055901

**Continuous Assessment Pattern**



Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

**Course Content:**

<b>Unit I: Introduction to surgical and medical physiotherapy condition</b>	<b>8 HOURS</b>
<ul style="list-style-type: none"> <li>❖ Physiotherapy in pre and post-operative stages.</li> <li>❖ Patient education and advice</li> </ul> General physiotherapy intervention	
<b>Unit II:Physiotherapy in abdominal Surgeries.</b>	<b>12 HOURS</b>
<ul style="list-style-type: none"> <li>❖ Abdominal incisions and its classification</li> <li>❖ General abdominal surgeries - oesophagus, stomach, duodenum</li> <li>❖ Operations on large and small intestine – Appendisectomy, cholecystectomy, partial colectomy, ileostomy, hernia and herniotomy, hernioraphy, hernioplasty.</li> <li>❖ Postoperative exercises after abdominal surgeries</li> </ul>	
<b>Unit III: Physiotherapy in burn and Plastic surgeries.</b>	<b>12. HOURS</b>
<ul style="list-style-type: none"> <li>❖ Burns and its treatment – physiotherapy in burns, skin grafts, and reconstructive surgeries.</li> <li>❖ Management of wound ulcers- Care of ulcers and wounds, Care of surgical scars</li> <li>❖ U.V.R and other electro therapeutics for healing of wounds, prevention of Hyper-Granulated Scars Keloids.</li> <li>❖ Electrotherapeutics measures for relief of pain during mobilization of scars tissues</li> </ul>	
<b>Unit IV: Physiotherapy in Obstetrics and Gynaecology</b>	<b>10 HOURS</b>
<ul style="list-style-type: none"> <li>❖ Ante and post-natal management</li> <li>❖ Common gynaecological condition and its management (prolapsed uterus, urogenital dysfunction, incontinence etc.)</li> <li>❖ Surgeries of pelvic floor (hysterectomy etc.)</li> </ul>	
<b>Unit V:Physiotherapy in geriatrics and general medical condition</b>	<b>10 HOURS</b>

- ❖ Geriatrics – handling of old patients and their problems
- ❖ Physiotherapy in dermatological condition:Hyperhydrosis, leprosy, infected wound ulcers etc.
- ❖ Physiotherapy in ENT conditionssinusitis, non-suppurative and chronic suppurative otitis media, labrynthitis, mastoidectomy, chronic rhinitis, laryngectomy, pharyngeo – laryngectomy, facia palsy.

**Unit VI: Recent advancements in surgical technologies.**  
**8 HOURS**

- ❖ Physiotherapy in post operative complications.
- ❖ Advancement in surgical tools: MARVEL (Multi-Angle Rear-Viewing Endoscopic tool), magnifying loupes, Surgical robots with artificial intelligence.
- ❖ **Recent technologies: Orthobiologic Technologies for healing process**, 3-D printing applications in orthopaedic surgeries, **Smart Sensor-Enabled (HARDI)**.

**Suggested Reading**

1. Tidy's physiotherapy. Porter, Stuart B., and Noël M. Tidy. 2013. Edinburgh: Elsevier.
2. Physiotherapy in Medical Conditions Suraj Kumar BPT MPT Phd
3. Physiotherapy in surgical conditions: Pushpalmitra
4. Cash's textbook of general medical and surgical conditions for physiotherapists Joan E Cash; Patricia A DowniePhiladelphia : Lippincott, ©1984.
5. Margaret Polden, Jill Mantle. Physiotherapy in Obstetrics &Gynecology 1st edition, Butterworth-Heinemann, 1990, ISBN: 978-0750600163

<b>Name of The Course</b>	<b>BPHY6003</b>			
<b>Course Code</b>	<b>Clinical Neurology &amp; Neurosurgery</b>			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	3	0	0	3

## Course Objectives

### The student is expected to study:

1. The clinical examination of a neurological patient.
2. The various circulatory, inflammatory, metabolic, degenerative, traumatic, autonomic disorders of the nervous system.
3. The etio-pathogenesis, the clinical features, management of various adult and child Psychiatric disorders and mental deficiencies.

## Course Outcomes

CO1	Evaluate the various neurological dysfunctions clinically and utilize the clinical knowledge in diagnosis and management of disorders of cerebral circulation & head injury.
CO2	Utilize the clinical knowledge in diagnosis and management of inflammatory, demyelinating, degenerative, cerebellar, coordination and extra pyramidal syndromes.
CO3	Demonstrate the cause, pathology, signs-symptoms, differential diagnosis and management of nerve disorders, muscle and neuro-muscular joint disorders.
CO4	Illustrate and demonstrate the cause, pathology, signs-symptoms, differential diagnosis and management of spinal cord disorders, central nervous system tumours, neuro psychological and neurobehavioral disorders
CO5	Illustrate and demonstrate the cause, pathology, signs-symptoms, differential diagnosis and management of pediatric neurological conditions and various neuro-surgical procedures.
CO6	Elaborate the recent advances in neuro diagnostic imaging and their functioning.

## Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

### Unit I: Clinical examination of neurological patients

10 hours

## Neurological assessment

- Principles of clinical diagnosis, higher mental function, assessment of brain & spinal cord function, evaluation of cranial nerves and evaluation of autonomic nervous system.
- Assessment of visual function
- Disorders of function in the context of Pathophysiology, Anatomy in Neurology and Cortical Mapping.
- Classification of neurological involvement depending on level of lesion

## Investigations

- principles, methods, views, normal/abnormal values/features, types of following investigative procedures- skull x-ray, CT, MRI, evoked potentials, lumbar puncture, CSF examination, EMG, NCV.

## Deafness, vertigo, and imbalance

- Physiology of hearing, disorders of hearing, examination & investigations of hearing, tests of vestibular function, vertigo, peripheral vestibular disorders, central vestibular vertigo.

## Cerebro-vascular diseases

- Stroke, TIA, RIA, stroke in evolution, multi-infarct dementia and Lacunar infarct. Classification of stroke – Ischemic, hemorrhagic, venous infarcts.

Head injury: Etiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications

## Unit II: Inflammatory conditions

10

hours

## Movement disorders

- Parkinson's disease, Dystonia, Chorea, Ballism, Athedosis, Tics, Myoclonus and Wilson's disease.

## Infections of brain and spinal cord

- Meningitis, Encephalitis, Poliomyelitis and Post-polio syndrome. Complications of systemic infections on nervous system – Septic encephalopathy, AIDS, Rheumatic fever, Brucellosis, Tetanus, and Pertussis.

## Multiple sclerosis

- Etiology, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, and complications.

**Toxic, metabolic and environmental disorders**

- Encephalopathy, Alcohol toxicity, Recreational drug abuse, Toxic gases & Asphyxia, Therapeutic & diagnostic agent toxicity, Metal toxicity, Pesticide poisoning, Environmental & physical insults, Pant & Fungal poisoning, Animal poisons, & Complications of organ transplantation.

**Cerebellar and coordination disorders**

- Congenital ataxia, Friedreich's ataxia, Ataxia telangiectasia, Metabolic ataxia, Hereditary cerebellar ataxia, Tabes dorsalis and Syphilis.

**Unit III: disorders of spinal cord and cauda equine 10 hours****Lower cranial nerve paralysis**

- lesions in trigeminal nerve, trigeminal neuralgia, trigeminal sensory neuropathy, lesions in facial nerve, facial palsy, bell's palsy, hemi facial spasm, Glossopharyngeal neuralgia, lesions of Vagus nerve, lesions of spinal accessory nerve, lesions of hypoglossal nerve. Dysphagia – swallowing mechanisms, causes of dysphagia, symptoms, examination, and management of dysphagia.

**Motor neuron diseases**

- Amyotrophic lateral sclerosis, Spinal muscular atrophy, Hereditary bulbar palsy, Neuromyotonia and Post-irradiation lumbosacral polyradiculopathy.

**Disorders of neuromuscular junction**

- Myasthenia gravis, Eaton-Lambert syndrome, and Botulism.

**Muscle diseases**

- Classification, investigations, imaging methods, Muscle biopsy, management of muscle diseases, genetic counselling. Classification, etiology, signs & symptoms of following disorders – Muscular dystrophy, Myotonic dystrophy, myopathy, Non-dystrophic myotonia.

**Polyneuropathy**

- Classification of Polyneuropathies, Hereditary motor sensory neuropathy, hereditary sensory and Autonomic neuropathies, Amyloid neuropathy, acute idiopathic Polyneuropathies. Guillain-Barre syndrome – Causes, clinical features, management of GBS, Chronic

Idiopathic Polyneuropathies, diagnosis of polyneuropathy, nerve biopsy.

**Focal peripheral neuropathy**

- Clinical diagnosis of focal neuropathy, neurotmesis, Axonotmesis, Neuropraxia.
- ❖ RSD, Nerve tumors, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic & Intercostal nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior & Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, Sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, Pudental nerve palsy.

**Unit IV: Spinal Cord Disorders 5 hours****Higher cortical, neuro psychological and neurobehavioral disorders**

- Non-epileptic attacks of childhood, Epilepsy in childhood, Seizures, and Epilepsy syndromes in adult.
- Dyssomnias, Parasomnias, Dementia, Obsessive-compulsive disorders.
- Neural basis of consciousness, causes & investigations of Coma, criteria for diagnosis of Brain death.
- Perceptual disorders and Speech disorders.

**Spinal cord disorders**

- Spinal cord injury, Compression by IVD prolapse, Spinal epidural abscess, Transverse myelitis, Viral myelitis, Syringomyelia, Spina bifida, Sub acute combined degeneration of the cord, Hereditary spastic paraplegia, Radiation myelopathy, Progressive encephalomyelitis, Conus medullaris syndrome, Bladder & bowel dysfunction, and Sarcoidosis.

❖ **Brain tumors and spinal tumors****Unit V: Paediatric neurology 5 hours****Paediatric neurology**

- Cerebral palsy, Hydrocephalus, Arnold-chiari malformation, Basilar impression, Klippel-Feil syndrome, Achondroplasia, Cerebral malformations, Autism, Dandy walker syndrome and Down's syndrome.

**Neuro surgeries**

- Craniotomy, Cranioplasty, Stereotactic surgery, Deep brain stimulation, Burr-hole, Shunting,

Laminectomy, Hemilaminectomy, Rhizotomy, Microvascular decompression surgery, Endarterectomy, Embolization, Pituitary surgery, Ablative surgery - Thalamotomy and Pallidotomy, Coiling of aneurysm, Clipping of aneurysm, and Neural implantation.

**Unit VI: Latest advances in Neuro diagnostic imaging.  
5 hours**

1. stereo-electroencephalography
2. diffusion tensor imaging (DTI)
3. Frameless stereotaxy
4. High angular resolution diffusion imaging (HARDI).

**Suggested Reading**

1. Michael Donaghy. Brain's Diseases of the Nervous System 12<sup>th</sup> edition, Oxford University Press, 2009, ISBN: 978-0198569381
2. Kenneth W. Lindsay, Ian Bone, Geraint Fuller. Neurology & Neurosurgery Illustrated 5<sup>th</sup> edition, Churchill Livingstone, 2010, ISBN: 978-0443069574
3. Patricia A. Downie. Cash's Textbook of Neurology for Physiotherapists, 4<sup>th</sup> edition, Lippincott, 1986, ISBN: 9780397582983
4. Susan B. O'Sullivan. Physical Rehabilitation 5<sup>th</sup> edition, Thomas J. Schmitz, F.A. Davis Company, 2006, ISBN: 978-0803612471
5. Anne Shumway-Cook, Marjorie H. Woollacott. Motor Control: theory & practical Application 2<sup>nd</sup> edition, Lippincott Williams & Wilkins, 2001, ISBN: 9780683306439
6. Darcy A. Umphred. Neurological Rehabilitation 5<sup>th</sup> edition, Mosby, 2006, ISBN: 978-0323033060
7. Margaret Johnstone. The Stroke Patient: Principles of Rehabilitation 1<sup>st</sup> illustrated edition, Churchill Livingstone, 1976, ISBN: 9780443014871
8. Michael Donaghy. Brain's Diseases of the Nervous System 12<sup>th</sup> edition, Oxford University Press, 2009, ISBN: 978-0198569381
9. Susan S. Adler, Dominiek Beckers, Math Buck. PNF in Practice: An Illustrated Guide 3<sup>rd</sup> edition, Springer, 2007, ISBN: 978-3540739012
10. Sophie Levitt. Treatment of Cerebral Palsy and Motor Delay 5<sup>th</sup> edition, Wiley-Blackwell, 2010, ISBN: 978-1405176163
11. Janet H. Carr, Roberta B. Shepherd. Neurological Rehabilitation: Optimizing Motor Performance 2<sup>nd</sup> edition Churchill Livingstone, 2010, ISBN: 978-0702040511
12. Prof. Walter R. Frontera. DeLisa's Physical Medicine and Rehabilitation: Principles and Practice, Two Volume Set, 5<sup>th</sup> edition, Lippincott Williams & Wilkins, 2010, ISBN: 978-0781798198
13. Nicki R. Colledge, Brian R. Walker, Stuart H. Ralston. Davidson's Principles & Practice of Medicine 21<sup>st</sup> edition, Churchill Livingstone, 2010, ISBN: 978-0702030857.

Name of The Course	Professionalism and values			
Course Code	BPHY6004			
Prerequisite				
Co-requisite				
Anti-requisite				
	L	T	P	C
	1	0	0	1

**Course Objectives:**

1. To study the concept of what it means to be a professional and how physiotherapy profession is different from a usual vocation.
2. To explain how relevant is professionalism in terms of healthcare system and how it affects the overall patient environment.

**Course Outcomes**

<b>CO1</b>	To Understand the importance of the ethics and moral values
<b>CO2</b>	To give importance attitude and professional behaviour treating people equally.

**Continuous Assessment Pattern**

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

**Course Content: 8 hours**

Unit I:	8 hours
<b>The Physiotherapist as Patient/Client manager.</b>	
<ol style="list-style-type: none"> <li>1. Evaluation and diagnosis</li> <li>2. Diagnosis as clinical decision making.</li> </ol>	

3. Prognosis.
4. Discharge planning and discontinuance of care
5. Discontinuance of care
6. Outcome
7. Clinical decision making
8. Referral relationships
9. Interpersonal relationships
10. **Ethical and legal issues**
11. **Informed consent**
12. Managed care and fidelity.

**8 Hours**
**Unit II 7 hours**  
**The Physiotherapist as Administrator**

1. History of physiotherapy administration
2. Contemporary physiotherapy administration
3. Patient/client management
4. First-line management
5. Midlevel managers and chief executive officers
6. Leadership
7. Ethical and legal issues.

1. The students are expected to study about leadership skills, management strategies and effective planning.
2. Understand the Dynamics of teaching & learning Plan effective teaching sessions in Physiotherapy

**Course Outcomes**

<b>CO1</b>	To apply the principles of management to evaluate organizational scenarios.
<b>CO2</b>	To understand the importance of Planning and making strategies in hospital.
<b>CO3</b>	To understand the organisational changes, managing the conflicts and making correct decisions within the organization.
<b>CO4</b>	To interpret the normal Administration-principles based on the Goal & Functions at large hospital set up / domiciliary services/ private clinic /academic institute.

**Continuous Assessment Pattern**

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test(CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
10	20	70	100

**Course Content:**
**Unit I: Principles of Management 10 Hours**

- Definition of Management, Characteristics of Management
- Management Functions/ the Process of Management, Nature of Management
- Management Vs. Administration
- Levels of Management, Managerial Skills
- Principles of Management & Significance of Management.

**Unit II: Strategic Management and Planning**
**10 Hours**

- Strategic management- basics, objectives, levels of strategy, SWOT analysis, strategy implementation. The Roles of Mission, Vision, and Values.
- The Concept of Planning, Nature and Scope of Planning

**Suggested Reading**

**Physical Therapy Ethics , 2<sup>nd</sup> Edition Donald L. Gabad PT, P.hD, Mike W. Martin P.hD , published by F DAVIS COMPANY ,Philadelphia.**

**Human Values and Professional Ethics, Values of Ethics & Profession by Jayshree Suresh, BS Raghavan**

**Published by S. Chand.**

<b>Name of The Course</b>	Principles of Management			
<b>Course Code</b>	BPHY 7005			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	2	0	0	2

**Course Objectives**



- Importance of Planning, Advantages and Limits of Planning, Measures to Overcome Limitations of Planning
- Basic Principles of Planning, Categories and Levels of Planning
- Essential Steps in Planning, Planning tools & techniques

### Unit III: Time Management & Cost Efficiency

10Hours

- Introduction to time management, principles of time management, importance of time management, setting priorities
- Goals of time management, Task list, relation between stress & time management.
- Comparing types on time management, role of latest technology for time management.
- Definition of cost, types of cost, definition of cost effectiveness
- definition of cost efficiency, principles of efficiency, measuring cost effectiveness and efficiency.

### Unit IV: Physiotherapy academician

1. Measurement and evaluation
2. Guidance and counseling
3. Faculty development program
4. Administration in clinical setting
5. Use of A-V aids in teaching
6. Taxonomy of education

### Course Objectives

#### To study

1. Basic principles of assessment and application of physical therapy in treatment of various musculoskeletal condition.
2. Application of principles of physiotherapy assessment and management in sports condition

#### Course Outcomes

CO1	To be able to identify disabilities due to various musculoskeletal dysfunction
CO2	To plan and set treatment goals
CO3	To apply the skills gained in exercise therapy in clinical situation
CO4	To apply the skills gained in electro therapy in clinical situations
CO5	To apply the skills of physiotherapy in different sports condition

#### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
30		70	100

#### Course Content :

1. To perform physiotherapy assessment of an orthopaedic patient
2. To perform Special tests for upper limb
3. To perform special tests for lower limb
4. To perform neuro-dynamic testing.
5. To study McKinzie assessment
6. To study physiotherapy assessment of an amputee patient.
7. To study basic principles of application of physical therapy in treatment of degenerative conditions
8. To study basic principles of application of physical therapy in treatment of rheumatoid conditions
9. To study basic principles of application of physical therapy in treatment of spinal conditions
10. To study basic principles of application of physical therapy in treatment of amputation

#### Suggested Reading

1. Textbook of management- Philip Kotler
2. Textbook on management, by R. Pettinger (14<sup>th</sup> edition)

Name of The Course	PT in Ortho and Sports LAB			
Course Code	BPHP 6005			
Prerequisite				
Co-requisite				
Anti-requisite				
	L	T	P	C
	0	0	4	2



**Suggested Reading**

- Brent Brotzman. Clinical Orthopaedic Rehabilitation: An Evidence-Based Approach 3<sup>rd</sup> edition, Robert C. Manske, Mosby Publishers, 2011, ISBN: 978-0323055901
- Susan B. O'Sullivan. Physical Rehabilitation 5<sup>th</sup> Edition, Thomas B. Schmitz, F a Davis Company, 2007, ISBN: 9780803612471
- David J. Magee. Orthopedic Physical Assessment 5<sup>th</sup> edition, Elsevier Health Sciences, 2008, ISBN: 978-0721605715
- Geoff Maitland Elly Hengeveld, Kevin Banks, Kay English. Maitland's Vertebral Manipulation 7<sup>th</sup> edition, Butterworth-Heinemann, 2005, ISBN: 9780750688062
- John Ebnezer. Essentials of Orthopaedics for Physiotherapists 1<sup>st</sup> edition, Jaypee Brothers Medical Publisher (P) Ltd, 2003, ISBN: 9788180611148

<b>Name of The Course</b>	<b>BPHP6007</b>			
<b>Course Code</b>	<b>Clinical Neurology &amp; Neurosurgery (Lab)</b>			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	0	0	2	1

**Course Objectives****The student is expected to study:**

1. Evaluation and examination of a patient with neurological pathology
2. General outline of electro diagnostic procedures.
3. Interpretations and prognosis in different neurological conditions.
4. Principles of Physiotherapy at various stages of Rehabilitation, establishing the goals of rehabilitation and ADL training

**Course Outcomes**

<b>CO1</b>	<b>To interpret the differential diagnosis of various neurological conditions.</b>
<b>CO2</b>	<b>To evaluate the various neurological dysfunctions clinically.</b>

**Continuous Assessment Pattern**

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test(CAT/CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
30		70	100

**Course Content:**

<b>Practicals:</b>	<b>30 Hrs</b>
<b>Practical 1:</b> Clinical examination of a neurological patient: consciousness, memory, attention, cognitive functions, motor examination, sensory examination	
<b>Practical 2:</b> Clinical examination of a neurological patient: consciousness, memory, attention, cognitive functions, motor examination, sensory examination	
<b>Practical 3:</b> demonstrate Cranial nerve examination	
<b>Practical 4:</b> Demonstrate Use of scales in various neurological conditions: Glasgow Coma Scale, ASIA impairment scale, Ranchos Los Amigos Scale	
<b>Practical 5:</b> Demonstrate Physiotherapy Assessment and management protocol of Spinal cord injury	
<b>Practical 6:</b> Demonstrate static and dynamic Balance tests	
<b>Practical 7:</b> Demonstrate equilibrium and non equilibrium Coordination tests	
<b>Practical 8:</b> Demonstrate on observational and analytical Gait assessment	
<b>Practical 9:</b> Demonstrate the prevention of secondary complications of bed ridden patient after neurosurgery.	
<b>Practical 10:</b> Demonstration of reeducation and recreational training techniques after neurosurgery.	

**Suggested Reading**

1. Michael Donaghy. Brain's Diseases of the Nervous system 12<sup>th</sup> edition, , Oxford University Press, 2009, ISBN: 978-0198569381.
2. Kenneth W. Lindsay, Ian Bone, Geraint Fuller. Neurology & Neurosurgery Illustrated 5<sup>th</sup> edition, Churchill Livingstone, 2010, ISBN: 978-

0443069574.

3. Patricia A. Downie. Cash's Textbook of Neurology for Physiotherapists, 4<sup>th</sup> edition, Lippincott, 1986, ISBN: 9780397582983.
4. Susan B. O'Sullivan, Physical Rehabilitation 5<sup>th</sup> edition, Thomas J. Schmitz, F.A. Davis Company, 2006, ISBN: 978-0803612471.
5. Anne Shumway-Cook, Marjorie H. Woollacott. Motor Control: theory & practical Application 2<sup>nd</sup> edition, Lippincott Williams & Wilkins, 2001, ISBN: 9780683306439.
6. Darcy A. Umphred. Neurological Rehabilitation 5<sup>th</sup> edition, Mosby, 2006, ISBN: 978-0323033060  
Patricia A. Downie. Cash's Textbook of Neurology for Physiotherapists, 4<sup>th</sup> edition, Lippincott, 1986, ISBN: 9780397582983.
7. Susan B. O'Sullivan, Physical Rehabilitation 5<sup>th</sup> edition, Thomas J. Schmitz, F.A. Davis Company, 2006, ISBN: 978-0803612471.
8. Anne Shumway-Cook, Marjorie H. Woollacott. Motor Control: theory & practical Application 2<sup>nd</sup> edition, Lippincott Williams & Wilkins, 2001, ISBN: 978068330643

### Course Outcomes

<b>CO1</b>	To demonstrate an understanding of patient's problem and chief complaint.
<b>CO2</b>	To demonstrate the clinical special tests for various musculoskeletal and neurological conditions.
<b>CO3</b>	To employ the best treatment method on patients to achieve a favourable outcome.
<b>CO4</b>	To demonstrate teamwork, leadership, better understanding of the situation and professional qualities in OPD and IPD setups.
<b>CO5</b>	To demonstrate work ethics and maintain records of the patients for future use and follow-up.

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
50	00	00	50

### Course Contents:

<b>Practical: 1 Clinical Assessment and examination of Upper limb</b>
<b>Practical: 2 Clinical Assessment and examination of Lower limb</b>
<b>Practical 3: Clinical Assessment and examination of Spine</b>
<b>Practical: 4 Neurological Examination: Assessment of higher mental functions, history taking, sensory assessment, motor assessment, balance and coordination assessment, Quality of life assessment</b>
<b>Practical: 5 Two Case studies</b>

Suggested reading

### Text Book (s):

**Orthopedics physical Assessment by David Magee, 6<sup>th</sup> edition, Elsevier India (2014)**

<b>Name of The Course</b>	<b>Clinical Posting (one month)</b>			
<b>Course Code</b>	<b>BPHP6008</b>			
<b>Prerequisite</b>				
<b>Corequisite</b>				
<b>Antirequisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>0</b>	<b>0</b>	<b>8</b>	<b>4</b>

### Course Objectives

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

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

**Reference Book (s)**

**Textbook of Orthopaedics by John Ebnezar, Jaypee Brothers Medical Publishers**

Internal Assessment (IA)	Mid Term Test (CAT)	End Term Test (ETE)	Total Marks
10	20	70	100

Name of The Course	Physiotherapy In Neurology & Psychosomatic Disorder			
Course Code	BPHY7001			
Prerequisite				
Co-requisite				
Anti-requisite				
	L	T	P	C
	4	0	0	4

**Course Content:**

**Unit-1 -Introduction of Neurological Assessment & Neuro physiological Technique (12 hours)**

- Examination, Chief complaints, History taking – Present, Past, medical, familial, personal histories, Observation, Palpation, Higher mental function – Consciousness, Orientation, Wakefulness, memory, Speech, Reading, Language, Writing, Calculations, Perception, Left right confusion, Reasoning, and Judgment, Motor Examination – Muscle power, Muscle tone, Spasticity, Flaccidity, Reflexes – Developmental reflexes, deep tendon reflexes, Superficial reflexes, Sensory examination – Superficial, Deep and Cortical sensations, Special tests – Romberg's, Kernig's sign, Brudzki sign, Tinels's sign, Slum test, Lehermitte's sign, Bells Phenomenon, Gower's sign, Sun set sign, Battle's sign, Glabellar tap sign, etc, Balance examination, coordination examination, Gait analysis – Kinetics & Kinematics (Quantitative & Qualitative analysis), Functional Analysis, Assessment tools & Scales – Modified Ashworth scale, Berg balance scale, FIM, Barthel index, Glasgow coma scale, Mini mental state examination, Rancho Los Amigos Scale for Head injury, APGAR score, ASIA scale, Reflex Grading. Differential diagnosis.
- Neuro physiological Techniques :- Concepts, Principles, Techniques, Effects of following Neurophysiological techniques: NDT, PNF, Vojta therapy, Rood's Sensory motor Approach, Sensory Integration Approach, Brunnstorm movement therapy, Motor relearning program, Contemporary task oriented approach, Muscle re-education approach and Constraint induced movement therapy.

**Unit-2 Evaluation and Management of Brain & Spinal Cord Disorders, Cerebellar and Muscle Disorders (12 hours)**

- History, Observation, Palpation, Higher mental function, Cranial nerve examination, Motor & Sensory examination, Reflex testing, differential**

**Course Objectives****The student is expected to study:**

- The clinical examination of a neurological patient.
- The neurology and neurosurgery with skills to apply these in clinical situations of dysfunction and neurological pathology.
- The etio-pathogenesis, the clinical features, management of various adult and child Psychiatric disorders and mental deficiencies

**Course Outcomes**

CO1	To evaluate the various Neurological Assessment & Neuro physiological Technique
CO2	To evaluate & utilize the clinical knowledge in diagnosis and management of Brain & Spinal Cord Disorders, Cerebellar and Muscle Disorders
CO3	To Illustrate Paediatric Neurology and demonstrate the, Evaluation and Management of Peripheral Nerve Injuries and Disorders
CO4	To relate and assess various Neurological gaits & Applied Yoga in Neurological conditions.
CO5	To utilize the clinical knowledge in Pre- and post-surgical assessment and treatment of neurological conditions
CO6	Appraise the recent evaluation methods and rehabilitation techniques for neurological disorders

**Continuous Assessment Pattern**

<p><b>Diagnosis, Balance &amp; Coordination examination, Gait analysis, Functional analysis, List of Problems &amp; Complications, short &amp; Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches &amp; Modalities in Cerebro vascular Accident, Meningitis, Encephalitis, Head Injury, Brain Tumors, Perceptual disorders, Amyotrophic lateral sclerosis, and Multiple sclerosis.</b></p> <p><b>2. Cerebellar, Spinal Cord and Muscle Disorders :</b> History, Observation, Palpation, Motor &amp; Sensory examination, Reflex testing, differential Diagnosis, Balance &amp; Coordination examination, Gait analysis, Functional analysis, List of Problems &amp; Complications, short &amp; Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches &amp; Modalities in Ataxia, Sensory Ataxia, Parkinson's disease, Muscular dystrophy (DMD), Myasthenia Gravis, Eaton-Lambert Syndrome, Spinal tumors, Spinal cord injury, Transverse myelitis, Bladder &amp; Bowel Dysfunction, Spinal muscular atrophies, Poliomyelitis, Post-Polio Syndrome.</p>
<p><b>Unit-3 Paediatric Neurology ,Evaluation and Management of Peripheral Nerve Injuries and Disorders</b></p> <p><b>(12hours)</b></p> <p>1. Paediatric Examination, Developmental milestones, developmental reflexes, Neuro developmental screening tests. Evaluation &amp; Management - History, Observation, Palpation, Milestone Examination, developmental reflex Examination, Higher mental function, Cranial nerve examination, Motor &amp; Sensory examination, Reflex testing, differential Diagnosis, Balance &amp; Coordination examination, Gait analysis, Functional analysis, List of Problems &amp; Complications, short &amp; Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches &amp; Modalities in Risk babies, Minimum brain damage, Developmental disorders, Cerebral palsy, Autism,</p>

<p>Down's Syndrome, Hydrocephalus, Chorea, Spina bifida, and syringomyelia.</p> <p><b>2. History, Observation, Palpation, Motor &amp; Sensory examination, Reflex testing, differential Diagnosis, Balance &amp; Coordination examination, Gait analysis, Functional analysis, List of Problems &amp; Complications, short &amp; Long Term goals, Management of systemic complications, Management of Mechanical Complications, Use of various Neurophysiological approaches &amp; Modalities in Hereditary motor sensory neuropathy, Guillain-Barre syndrome, Brachial plexus palsy, Thoracic outlet syndrome, Lumbosacral plexus lesions, Phrenic &amp; intercostals nerve lesions, Median nerve palsy, Ulnar nerve palsy, Radial nerve palsy, Musculocutaneous nerve palsy, Anterior &amp; Posterior interosseous nerve palsy, Axillary nerve palsy, Long thoracic nerve palsy, Suprascapular nerve palsy, sciatic nerve palsy, Tibial nerve palsy, Common peroneal nerve palsy, Femoral nerve palsy, Obturator nerve palsy, and Pudental nerve palsy.</b></p>
<p><b>Unit-4 Assessment and management of Neurological gaits , Applied Yoga in Neurological conditions. (12 hours)</b></p> <p>1. Quantitative and Qualitative (Kinetic &amp; Kinematics) analysis, List of Problems, short &amp; Long Term goals, Management of following Neurological Gaits - Hemiplegic gait, Parkinson gait, High step gait, Hyperkinetic gait, Hypokinetic gait, Waddling gait, Scissoring gait, Spastic gait, Chorea form Gait, Diplegic Gait, and Myopathic Gait.</p> <p>2. Applied Yoga in Neurological conditions</p>
<p><b>Unit-5- Pre and post-surgical assessment and treatment of following conditions :- (8 hours)</b></p> <p>1. spinal disc herniation,</p> <p>2. Spinal stenosis, Spinal cord trauma, Head trauma, Brain tumors, Tumors of the spine,</p> <p>3. Spinal cord and peripheral nerves, Cerebral aneurysms, Subarachnoid hemorrhages, epilepsy,</p> <p>4. Parkinson's disease, Chorea, Hemiballism, Psychiatric disorders, Malformations of the nervous</p>

system, Carotid artery stenosis , Arteriovenous malformations, and Spina bifida

### Unit 6 - Recent advances in Neurological physiotherapy (4 hours)

5. Assessment: Retraining and posturgraphy , biofeedback
6. Advanced neurorehabilitation techniques: Robotic-assisted training, body weight supported treadmill training, virtual reality, body awareness therapy, Non- invasive brain stimulation, functional electrostimulation, hippotherapy, coma stimulation therapy
7. Evidence based practice: Case studies

	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

### Course Objectives:

The student is expected to study the basic principles and application of

- Enumerate the steps of research process
- Explain the different research methods
- Describe the importance and use bio-statistics for research work
- Develop skills of critical thinking and selection of research strategy
- Acquire skills to review literature, formulate problems, research writing and publishing.

### Course Outcomes

<b>CO1</b>	<b>To assess the appropriateness of different kinds of research designs and methodology for instance in terms of their appropriateness, transparency and quality.</b>
<b>CO2</b>	<b>Propose a research study and justify the theory as well as the methodological decisions, including sampling and measurement</b>
<b>CO3</b>	<b>Choose appropriate quantitative or qualitative method to collect data.</b>
<b>CO4</b>	<b>To apply advanced knowledge in statistics to experimental and applied research.</b>
<b>CO5</b>	<b>To assess and critique a published journal article that uses one of the primary research methods in the field.</b>
<b>CO6</b>	<b>Understanding the basics of data analysis ,research writing &amp; plagiarism</b>

### Suggested Reading

- Michael Donaghy. Brain`s Diseases of the Nervous system 12<sup>th</sup> edition, , Oxford University Press, 2009, ISBN: 978-0198569381
- Kenneth W. Lindsay, Ian Bone, Geraint Fuller. Neurology & Neurosurgery Illustrated 5<sup>th</sup> edition, Churchill Livingstone, 2010, ISBN: 978-0443069574
- Nicki R. Colledge, Brian R. Walker, Stuart H. Ralston. Davidson`s Principles & Practice of medicine 21<sup>st</sup> edition, Churchill Livingstone, 2010, ISBN: 978-0702030857
- Niraj Ahuja. A Short Textbook of Psychiatry, 6<sup>th</sup> edition, Jaypee Brothers Medical Publishers (P) Ltd, 2006, ISBN: 9788180618710
- Michael Gelder, Paul Harrison, Philip Cowen. Shorter Oxford Text Book of Psychiatry 6<sup>th</sup> edition, OUP Oxford Publishers, 2006, ISBN: 978-0198566670

<b>Name of The Course</b>	<b>RESEARCH METHODOLOGY AND BIostatISTICS</b>
<b>Course Code</b>	<b>BPHY7002</b>
<b>Prerequisite</b>	
<b>Corequisite</b>	
<b>Antirequisite</b>	

### Continuous Assessment Pattern

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test (CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
<b>10</b>	<b>20</b>	<b>70</b>	<b>100</b>



## Course Contents:

<p><b>Unit-1</b> 12 hours</p> <p><b>Research in Physiotherapy</b></p> <ul style="list-style-type: none"> <li>❖ Introduction to Research methodology: Meaning of research, objectives of research, Motivation in research</li> <li>❖ Types of research &amp; research approaches</li> <li>❖ Research methods vs methodology</li> <li>❖ Criteria for good research, Problems encountered by researchers in India.</li> </ul> <p><b>Concepts of Measurements and Scaling technique</b></p> <ul style="list-style-type: none"> <li>❖ Measurement scales, sources of error in measurement, Technique of developing measurement tools</li> </ul> <p>Meaning of scaling, its classification. Important scaling techniques.</p>
<p><b>Unit-2</b> 12 hours</p> <p><b>Research Problem and Research Design</b></p> <ul style="list-style-type: none"> <li>❖ Statement of research problem., Statement of purpose and objectives of research problem, Necessity of defining the problem</li> </ul> <p>: Meaning of research design, Need for research design, Features for good design, Different research designs, Basic principles of research design</p> <p><b>Sampling fundamentals and Sampling Design</b></p> <ul style="list-style-type: none"> <li>❖ Sampling fundamentals: need for sampling &amp; some fundamental definitions, important sampling distributions.</li> <li>❖ Sampling Design: Criteria for selecting sampling procedure, Implications for sample design, steps in sampling design, Characteristics of good sample design, Different types of sample design</li> </ul>
<p><b>Unit-3</b> 12 hours</p> <p><b>Hypothesis Testing</b></p> <ul style="list-style-type: none"> <li>❖ What is hypothesis? Basic concepts concerning testing of hypothesis</li> </ul>

<ul style="list-style-type: none"> <li>❖ Procedure of hypothesis testing, measuring the power of hypothesis test</li> <li>❖ Tests of hypothesis, limitations of the tests of hypothesis</li> </ul> <p><b>Data Collection Methods</b></p> <ul style="list-style-type: none"> <li>❖ Collection of primary data, collection of data through questionnaires &amp; schedules, Difference between questionnaires &amp; schedules.</li> </ul> <p><b>Data Analysis and Processing</b></p> <p>Processing operations, problems in processing, Types of analysis</p>
<p><b>Unit-4</b> 12 hours</p> <p><b>Introduction to Biostatistics</b></p> <ul style="list-style-type: none"> <li>• Meaning, definition, characteristics of statistics., Importance of the study of statistics</li> <li>• Branches of statistics, Statistics and health science including physiotherapy</li> <li>• Parameters and Estimates, Descriptive and inferential statistics, Variables and their types, Measurement scales.</li> </ul> <p><b>Tabulation of Data</b></p> <ul style="list-style-type: none"> <li>• Basic principles of graphical representation</li> <li>• Types of diagrams – histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve.</li> </ul> <p><b>Measures of Central Tendency</b></p> <ul style="list-style-type: none"> <li>• Need for measures of central Tendency</li> <li>• Definition and calculation of mean – ungrouped and grouped, Meaning, interpretation and calculation of median ungrouped and grouped</li> <li>❖ Meaning and calculation of mode</li> <li>❖ Comparison of the mean, median and mode, Guidelines for the use of various measures of central tendency</li> </ul>
<p><b>Unit-5</b> 8 hours</p> <p><b>Probability and Standard Deviation</b></p> <ul style="list-style-type: none"> <li>• Meaning of probability of standard distribution</li> <li>• The binomial distribution, the normal distribution, Divergence from normality – skewness, kurtosis.</li> </ul>



**Analysis of variance and covariance**

- Analysis of variance (ANOVA), what is ANOVA?
- Basic principle of ANOVA, ANOVA technique
- Analysis of Covariance (ANCOVA).

**Format of scientific documents. (Structure of protocols, formats reporting in scientific journals, systematic reviews and meta-analysis).**

**Unit 6**  
**4 hours**

- Introduction to statistical analysis its basic concepts & its application.
- Introduction to qualitative research writing
- Introduction to plagiarism

<b>Name of The Course</b>	<b>Clinical Cardiovascular and Pulmonary</b>			
<b>Course Code</b>	BPHY7004			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	L	T	P	C
	4	0	0	4

**Course Objectives**

1. To study various cardiac and pulmonary disorders and their common investigations.
2. To study clinical reasoning and documentation for cardiac and pulmonary disorders and patients for general surgery.

**Course Outcomes**

CO1	To understand the basic knowledge of anatomy, physiology, common diseases/ conditions involving cardiovascular and pulmonary systems.
CO2	To illustrate various cardiopulmonary investigatory techniques.
CO3	To describe and implement management for various cardiac diseases.
CO4	To describe and implement treatment protocol for various disorders of heart.
CO5	To describe and implement management for various pulmonary diseases.
CO6	To demonstrate the recent approaches in clinical cardiovascular and pulmonary system

**Suggested Reading****Text Book (s)**

- Carolyn M. Hicks. **Practical Research Methods for Physiotherapists**, Churchill Livingstone, 1988, ISBN: 978-0443037573

**Reference Book (s)**

- Mitchell Batavia. **Clinical Research for Health Professionals: A User-Friendly Guide** 1st edition, Butterworth-Heinemann, 2000, ISBN: 978-0750671934
- B.K. Mahajan. **Methods in Biostatistics** 6<sup>th</sup> edition, Jaypee Brothers Publishers, 2002, ISBN: 9788171795208

**Continuous Assessment Pattern**

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test (CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
<b>10</b>	<b>20</b>	<b>70</b>	<b>100</b>

**Course Content:****Unit-1: Anatomy and Physiology. 12 hours**

- a) Respiratory system
  - i. Upper respiratory tract, Lower respiratory tract, Respiratory unit, Muscles of respiration, Pleura, intra pleural space, intra pleural pressure, surfactant.
  - ii. Mechanics of respiration – Chest wall movements, lung & chest wall compliance, V/Q relationship, airway resistance.

iii. Neural & chemical regulation of respiration iv. Lung volumes and lung capacities, Spiro meter, lung function test v. Pulmonary circulation, Lung sounds. b) Cardiovascular system i. Chambers of heart, semi lunar and atria ventricular valves ii. Coronary circulation, conductive system of heart iii. Cardiac cycle, ECG, Heart sounds iv. Blood pressure, pulse, cardiac output
<b>Unit-2 :Examination&amp; Investigation. 8 hours</b>
a) Respiratory Disease : Chest X Rays, Pulmonary Function Testing, Arterial Blood Gas b) Cardiovascular System : ECG, Exercise Stress Testing, Radiology, Angiography
<b>Unit-3 : Cardiovascular diseases. 12 hours</b>
<ul style="list-style-type: none"> <li>Aetiology, pathogenesis, clinical features, complications, management of the following:-            - Ischemia heart disease, Myocardial infarction, Heart failure, Cardiac arrest, Rheumatic fever, Hypertension, Infective endocarditis, Myocarditis &amp; cardiomyopathy</li> </ul>
<b>Unit-4 : Disorders of the Heart 12 hours</b>
<ul style="list-style-type: none"> <li>Definition, Clinical features, diagnosis and choice of management for the following disorders :            - Congenital Heart diseases – Acyanotic &amp; Cyanotic congenital heart disease : Patent Ductus Arteriosus, Coarctation of Aorta, Atrial Septal Defect, Ventricular Septal Defect, Tetralogy of Fallot, Transposition of Great Vessels ; Acquired Heart Disease – Mitral Stenosis &amp; Insufficiency, Aortic Stenosis and Insufficiency, Ischemic Heart Disease – Coronary Artery Disease, Cardiac tumors.</li> </ul>
<b>Unit-5: Respiratory diseases &amp; Disorders. 8 hours</b>
a. Clinical manifestations of Lung disease ; COPD and RLD b. Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following lung diseases :

Chronic Bronchitis, Emphysema, Asthma, Bronchiectasis, Cystic Fibrosis, Upper Respiratory Tract Infections, Pneumonia, Tuberculosis, Fungal Diseases, Interstitial Lung Diseases, Diseases of the pleura, diaphragm and chest wall ; Respiratory failure – Definition, types, causes, clinical features, diagnosis and management.

Chest wall disorders- Clinical features, diagnosis and choice of management for the following disorders – chest wall deformities, chest wall tumors, Spontaneous Pneumothorax, Pleural Effusion, Empyema Thoracis, Lung abscess, Bronchiectasis, Tuberculosis,

**Unit-6: Recent Advances in Clinical Cardiovascular and Pulmonary. 8 hours**

Recent advancements in radiology imaging related to cardiopulmonary diseases.

**Suggested Reading**

- Donna L. Frownfelter. Chest physical therapy & pulmonary rehabilitation: an interdisciplinary approach, Yearbook Medical Publishers, 1978, ISBN: 9780815132967
- Jennifer A. Pryor, Ammani S. Prasad. Physiotherapy for Respiratory and Cardiac Problems 4th revised edition, Churchill Livingstone, 2008, ISBN: 9780080449852
- Joan E. Cash, Patricia Downie. Cash's text book of General Medical & Surgical conditions for Physiotherapists, 2nd edition revised, Mosby, ISBN: 978-0571140640
- Egan's Fundamentals of Respiratory Care 11ed

Name of The Course	Physiotherapy in Neurology & psychosomatic disorder (LAB)			
Course Code	BPHP7006			
Prerequisite				
Co-requisite				
Anti-requisite				
	L	T	P	C
	0	0	4	2

**Course Objectives:**

**The student is expected to study:****1. The clinical examination of a neurological patient.**

2. The neurology and neurosurgery with skills to apply these in clinical situations of dysfunction and neurological pathology.
3. The etio-pathogenesis, the clinical features, management of various adult and child Psychiatric disorders and mental deficiencies.

**Course Outcomes**

CO1	Study the assessment of a neurological patient and motor examination
CO2	Study the sensory examination to study the mental status examination of a patient
CO3	Study the cranial nerve examination and coordination and balance assessment.
CO4	Functional analysis and assessment tools & scales neuro physiological techniques
CO5	Study the superficial and deep reflexes and primitive and tonic reflexes and developmental milestones.

**Continuous Assessment Pattern**

Internal Assessment (IA)	Mid Term Test (CAT)	End Term Test (ETE)	Total Marks
30		70	100

**Course Content:**

List of Practical hours	60
1. <b>to study the assessment of a neurological patient</b> - examination, chief complaints, history taking –present, past, medical, familial, personal histories, observation, palpation.	
2. <b>motor examination</b> – muscle power, muscle tone, spasticity, flaccidity, reflexes – developmental reflexes, deep tendon reflexes, superficial reflexes.	
3. <b>to study the sensory examination</b> – superficial, deep and cortical sensations, special tests – romberg's, kernig's sign, brudenzki sign,	

- tinels's sign, slum test, lehermitte's sign, bells phenomenon, gower's sign, sun set sign, battle's sign, glabellar tap sign.
4. **to study the mental status examination of a patient**-consciousness, orientation, wakefulness, memory, speech, reading, language, writing, calculations, perception, left right confusion, reasoning, and judgment.
  5. **to study the cranial nerve examination.**
  6. **to study the coordination and balance assessment.**
  7. **functional analysis, assessment tools & scales** – modified ashworth scale, berg balance scale, fim, barthel index, glasgow coma scale, mini mental state examination, rancho los amigos scale for head injury, apgar score, asia scale, reflex grading, differential diagnosis.
  8. **neuro physiological techniques** :- concepts, principles, techniques, effects of following neurophysiological techniques: ndt, pnf, vojta therapy, rood's sensory motor approach, sensory integration approach, brunntorm movement therapy, motor relearning program, contemporary task oriented approach, muscle re-education approach and constraint induced movement therapy.
  9. to study the superficial and deep reflexes and primitive and tonic reflexes.
  10. to study about the developmental milestones.

**Suggested Reading**

- Susan B.O'Sullivan,. Physical Rehabilitation 5<sup>th</sup> edition, Thomas J. Schmitz, F.A. Davis Company, 2006, ISBN: 978-0803612471
- Anne Shumway-Cook, Marjorie H. Woollacott. MotorControl:theory&practicalApplication 2<sup>nd</sup> edition, Lippincott Williams & Wilkins, 2001, ISBN: 9780683306439
- Darcy A. Umphred. NeurologicalRehabilitation 5<sup>th</sup> edition, Mosby, 2006, ISBN: 978-0323033060
- Kenneth W. Lindsay, Ian Bone, Geraint Fuller. Neurology & Neurosurgery Illustrated 5<sup>th</sup> edition, Churchill Livingstone, 2010, ISBN: 978-

0443069574

- Nicki R. Colledge, Brian R. Walker, Stuart H. Ralston. Davidson's Principles & Practice of Medicine 21<sup>st</sup> edition, Churchill Livingstone, 2010, ISBN: 978-0702030857
- Niraj Ahuja. A Short Textbook of Psychiatry, 6<sup>th</sup> edition, Jaypee Brothers Medical Publishers (P) Ltd, 2006, ISBN: 9788180618710
- Michael Gelder, Paul Harrison, Philip Cowen. Shorter Oxford Text Book of Psychiatry 6<sup>th</sup> edition, OUP Oxford Publishers, 2006, ISBN: 978-0198566670

**Course Contents:**

Musculoskeletal, neurological, cardiothoracic, gynaecological and sports case presentation with Practical file

**Latest Trends**

- **Hands on practice**
- Mobilization
- Biofeedback
- Kinesiology taping
- Maitland techniques
- **workshop to be attended on**
- clinical physiotherapy techniques
- Physiotherapy recent advance trends
- **Topic presentation**
- Case presentation
- Presentation on new researches in the field of physiotherapy

<b>Name of The Course</b>	Clinical Posting (Critique inquiry, case presentation and discussion (Lab))			
<b>Course Code</b>	<b>BPHP7008</b>			
<b>Prerequisite</b>				
<b>Corequisite</b>				
<b>Antirequisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>0</b>	<b>0</b>	<b>12</b>	<b>6</b>

**Course Objectives**

3. To sensitize potential learners with essential knowledge, this will lay a sound foundation for their learning across the under-graduate program and across their career.
4. To ensure the attention of a student and make the more receptive such as group activities, interactive for a role-plays and clinical bed-side demonstrations.

**Course Outcomes**

<b>CO1</b>	<b>Understanding the bedside assessment of a patient or to the course of the disease</b>
<b>CO2</b>	<b>Understanding of critical cases.</b>

**Continuous Assessment Pattern**

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test(CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
<b>30</b>	<b>00</b>	<b>70</b>	<b>100</b>

**Suggested reading****Text Book (s):**

- Textbook of rehabilitation by S. Sunders
- **Tidy's Physiotherapy, 12th edition, Ann M. Thomson, Alison T. Skinner, Joan Piercy, Butterworth-Heinemann, 1991, ISBN: 978-0750613460**

- Carolyn Kisner, Lynn Allen Colby. Therapeutic Exercise: Foundations and Techniques 6<sup>th</sup> edition, F.A. Davis Company, 2012, ISBN: 978-0803625747
- Val Robertson, Alex Ward, John Low, Ann Reed. Electrotherapy explained: Principles & practice 4<sup>th</sup> edition, Butterworth-Heinemann publishers, 2006, ISBN: 978-0750688437

CO5	To understand and implement rehabilitation protocol for Cardiac patients
CO6	To develop insight of recent advances in Cardiopulmonary management

#### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

#### Reference Book (s)

- Susan L. Michlovitz. Thermal Agents in Rehabilitation, F a Davis Co, 1990, ISBN: 978-0803661653
- David J. Magee. Orthopedic Physical Assessment 5<sup>th</sup> edition, Elsevier Health Sciences, 2008, ISBN: 978-0721605715

Name of The Course	PHYSIOTHERAPY IN CARDIOVASCULAR, PULMONARY & INTENSIVE CARE			
Course Code	BPHY8001			
Prerequisite				
Corequisite				
Antirequisite				
	L	T	P	C
	4	0	0	4

#### Course Content:

#### Course Objectives

To study

- Evaluation, Clinical reasoning and Documentation for cardiac and pulmonary disorders and patients.
- The rehabilitation of cardiac and pulmonary cases.

#### Course Outcomes

CO1	To understand the principles of evaluate the cardiac or pulmonary patients.
CO2	To demonstrate and implement various physiotherapy techniques for cardiopulmonary patients
CO3	To design and implement rehabilitation protocol for ICU patients
CO4	To study, design and implement rehabilitation protocol for pulmonary patients

<p><b>Unit-1: Introduction &amp; Assessment 12 hours</b></p> <p><b>Introduction</b></p> <ul style="list-style-type: none"> <li>• Anatomical and Physiological differences between the Adult and Pediatric lung.</li> </ul> <p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>• Bedside assessment of the patient-Adult &amp; Pediatric.</li> <li>• Investigations and tests – Exercise tolerance Testing – Cardiac &amp; Pulmonary, Radiographs,</li> <li>• PFT, ABG, ECG, Hematological and Biochemical Tests.</li> </ul>
<p><b>Unit-2 : Physio therapeutic techniques in cardiac and pulmonary rehabilitation. 12 hours</b></p> <ul style="list-style-type: none"> <li>• Physiotherapy techniques to decrease the work of breathing – Measures to optimize the balance between energy supply and demand, positioning, Breathing re-education – Breathing control techniques, mechanical aids – IPPB, CPAP, BiPAP.</li> <li>• Physiotherapy techniques to clear secretions – Hydration, Humidification &amp; Nebulisation, Mobilization and Breathing exercises, Postural Drainage, Manual techniques – Percussion, Vibration and Shaking, Rib Springing, ACBT, Autogenic Drainage, Mechanical Aids – PEP, Flutter, IPPB, Facilitation of Cough and Huff, Nasopharyngeal Suctioning.</li> </ul>
<p><b>Unit-3: ICU Rehabilitation. 12 hours</b></p> <ul style="list-style-type: none"> <li>• Respiratory failure – Oxygen Therapy and Mechanical Ventilation.</li> <li>• Introduction to ICU : ICU monitoring – Apparatus, Airways and Tubes used in the ICU -</li> </ul>



Physiotherapy in the ICU – Common conditions in the ICU – Tetanus, Head Injury, Lung Disease, Pulmonary Oedema, Multiple Organ Failure, Neuromuscular Disease, Smoke Inhalation, Poisoning, Aspiration, Near Drowning, ARDS, Shock; Dealing with an Emergency Situation in the ICU.

- Neonatal and Pediatric Physiotherapy – Chest physiotherapy for children, The neonatal unit, Modifications of chest physiotherapy for specific neonatal disorders, Emergencies in the neonatal unit

#### **Unit-4 :Pulmonary Rehabilitation 12hours**

- Physiotherapy in Obstructive lung conditions.
- Physiotherapy in Restrictive lung conditions.
- Management of breathlessness.
- Physiotherapy following Lung surgeries
- Drug therapy – Drugs to prevent and treat inflammation, Drugs to treat Bronchospasm, Drugs to treat Breathlessness, Drugs to help sputum clearance, Drugs to inhibit coughing, Drugs to improve ventilation, Drugs to reduce pulmonary hypertension, Drug delivery doses, Inhalers and Nebulisers.

#### **Unit-5 Cardiac Rehabilitation 12 hours**

- Physiotherapy management following cardiac surgeries.
- Physiotherapy management following PVD.
- Abdominal Surgeries - Management of Pulmonary Restorative Dysfunction following surgical procedures on Abdomen and Thorax.
- Management of Amputations following Diabetes, PVD - Prosthesis in amputations of lower limbs following ulcers and gangrenes.
- Home program and education of family members in patient care.
- Treatment, Response to exercise and Implications of Physiotherapy in the following disease conditions: Hypertension, Diabetes, Renal Failure and Obesity.
- Applied Yoga in Cardio-respiratory conditions

#### **Unit- 6 : Recent advancements in PT in Cardiovascular, Pulmonary & ICU 8 hours**

- Recent guidelines of CPR
- New classification of COPD & Asthma in ACOS

- Exsufflation and Insufflation Technique for Airway Clearance.

#### **Suggested Reading**

5. Donna L. Frownfelter. Chest physical therapy & pulmonary rehabilitation: an interdisciplinary approach, Yearbook Medical Publishers, 1978, ISBN: 9780815132967
6. Egan's Fundamentals of Respiratory Care 11ed
7. P J Mehta Practical medicine
8. Jennifer A. Pryor, Ammani S. Prasad. Physiotherapy for Respiratory and Cardiac Problems 4th revised edition, Churchill Livingstone, 2008, ISBN: 9780080449852
9. Tidys physiotherapy book
10. Joan E. Cash, Patricia Downie. Cash`s text book of General Medical & Surgical conditions for Physiotherapists, 2nd edition revised, , Mosby, ISBN: 978-0571140640

<b>Name of The Course</b>	<b>Community Physiotherapy (One month project) in association with NGO, Aanganwadi etc.</b>			
<b>Course Code</b>	BPHP8002			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	3	0	8	4

#### **Course Objectives**

- To study the various communities-based rehabilitation
- To study the basic knowledge and requirements of CBR, restoring function, and preventing disability.
- To observe community problems
- To Understand importance of community physiotherapy

#### **Course Outcomes**

<b>CO1</b>	To Identify problems in rural healthcare system
<b>CO2</b>	To planning and management of CBR programmes and disability



CO3	To set treatment goals and apply the skills gained in rehabilitating and restoring functions.
CO4	To understand the Role of physiotherapy in community problems.
CO5	Visit to regular mobile camps
CO6	Adapt recent advances in CBR

### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test(CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

### Course Content:

<p><b>Unit I: Introduction of rehabilitation and community</b></p> <p style="text-align: right;"><b>15</b></p> <p><b>Hours</b></p> <ul style="list-style-type: none"> <li>• <b>Rehabilitation:</b> Definition, Types.</li> <li>• <b>Community:</b> Definition of Community, Multiplicity of Communities, The Community based approach, Community Entry strategies, CBR and Community development, Community initiated versus community oriented programme, Community participation and mobilization.</li> <li>• <b>Introduction to Community Based Rehabilitation:</b> Definition, Historical review, Concept of CBR, Need for CBR, Difference between Institution based and Community based Rehabilitation, Objectives of CBR, Scope of CBR, Members of CBR team, Models of CBR.</li> <li>• <b>Principles of Community based Rehabilitation.</b> W.H.O's policies-about rural health care- concept of primary /tertiary health centers-district hospitals etc-Role of P.T.- Principles of a team work of Medical person/P.T./O.T. audiologist/speech therapist /P.&amp;O./vocational guide in C.B.R. of physically handicapped person , Agencies involved in rehabilitation of physical handicapped - Legislation for physically handicapped. Concept of multipurpose health worker. Role of family members in the rehabilitation of a physically handicapped.</li> </ul>
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### Unit II: Planning and management of CBR programmes and disability

15 Hours

- **Planning, Ownership and Governance, Decentralization and CBR, Management of CBR, Programmed sustainability, Communication and Coordination, Community participation, mobilization and awareness, CBR programme influence on promoting and developing public policies.**
- **Disability: Definition and difference of Impairment, Handicap and Disability, Types and causes and prevention of disability. Disability in developed and developing countries, Disability Surveys: Demography. Screening: Early detection of disabilities and developmental disorders, Prevention of disabilities- Types and levels.**

**Disability Evaluation:** Introduction, What, Why and How to evaluate, Quantitative versus Qualitative data, Uses of evaluation findings

### Unit III: Role of different organization in CBR

15 Hours

- **Role of Government in CBR: Laws, Policies, Programmes, Human Rights Policy, Present rehabilitation services, Legal aspects of rehabilitation.**
- **Role of Social work in CBR: Definition of social work, Methods of social work, History of social work, Role of social worker in rehabilitation.**
- **Role of voluntary Organizations in CBR: Charitable Organizations, Voluntary health agencies**
  - **National level and International NGO's, Multilateral and Bilateral agencies. International Health Organizations: WHO, UNICEF, UNDP, UNFPA, FAO, ILO, World bank, USAID, SIDA, DANIDA, Rockefeller, Ford foundation, CARE, RED CROSS.**

<ul style="list-style-type: none"> <li>National District Level Rehabilitation Programme: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker</li> </ul>
<b>Unit IV: Role of Physiotherapy in CBR</b>  <b>15 Hours</b>
<ul style="list-style-type: none"> <li><b>Role of Physiotherapy in CBR:</b> Screening for disabilities, Prescribing exercise programme, Prescribing and devising low cost locally available assistive aids, Modifications physical and architectural barriers for disabled, Disability prevention, Strategies to improve ADL, Rehabilitation programmes for various neuro-musculoskeletal and cardiothoracic disabilities.</li> <li><b>Screening and rehabilitation of paediatric disorders in the community:</b> Early detection of high risk babies, Maternal nutrition and education, Rehabilitation of Cerebral Palsy, Polio, Downs Syndrome, Muscular Dystrophies etc., Prevention and rehabilitation of mental retardation and Behavioural disorders, Immunization programmes, Early intervention in high risk babies, Genetic counselling.</li> <li><b>Extension services and mobile units:</b> Introduction, Need, Camp approach.</li> <li><b>Vocational training in rehabilitation:</b> Introduction, Need, Vocational evaluation, Vocational rehabilitation services.</li> <li><b>Geriatrics- Physiology of Aging /degenerative changes-Musculoskeletal /Neuromotor /cardio – respiratory-/Metabolic, Endocrine, Cognitive, Immune systems. Role of Physio Therapy in Hospital based care, Half-way homes, Residential homes, Meals on wheels etc. Home for the aged, Institution based Geriatric Rehabilitation. Few conditions:- Alzheimer's disease, Dementia, Parkinson's Disease, Incontinence,</b></li> </ul>

<b>Iatrogenic drug reactions, etc. Ethics of Geriatric Rehabilitation.</b>	
<b>Unit V: Industrial Health &amp; Ergonomics</b>	<b>15</b>
<b>Hours</b>	
	<b>Field visit to urban/rural PHC, Mobile camps, disability surveys in villages, and Disability screening, Evaluation and Physiotherapy prescription techniques for musculoskeletal problems in community, evaluation and prescription techniques for ambulatory and assistive devices, Fabrication of low cost assistive devices with locally available materials</b>
Unit VI Advances in CBR.....	15 hours
Accessibility of physiotherapy in remote areas through telehealth Study of different projects like Youth for India Advanced community Projects	

### Suggested Reading

#### Text Book (s)

- Preventive and Social Medicine. Reviewed by Rashmi Sharma. CBS Publishers and Distributors Pvt., Ltd : New Delhi, India. 2017.
- Textbook of Community Medicine (Preventive & Social Medicine) by Sunderlal (Author) ISBN-13: 978-8123914411. ISBN-10: 8123914415

#### Reference Book (s)

- Public Health and Preventive Medicine - "The RED BOOK", By AFMC, Pune in Collaboration with WHO India Office, New Delhi.

- **Textbook of Community Medicine: Preventive and Social Medicine, by Sunderlal**
- **Foundation of Community Medicine. CM Dhaar, Rubbani**
- **Community Medicine (With Recent Advances) by Suryakantha AH, Jaypee Publications**
- **A Comprehensive textbook of Community Medicine, Mathur**
- **Principles & Practice of Community Medicine, Asma Rahim, Jaypee Publications**
- **A text book of family medicine, by Ian k MC Whinnry**
- **Textbook of Community & Social Pediatrics, SR Banerjee**

CO3	To demonstrate and implement rehabilitation protocol for ICU patients.
CO4	To design and implement rehabilitation protocol for pulmonary patients.
CO5	To design and implement rehabilitation protocol for Cardiac patients.

#### Continuous Assessment Pattern

Internal Assessment (IA)	Continuous Assessment Test (CAT)	End Term Exam (ETE)	Total Marks
10	20	70	100

#### Course Content:

Practicals :	38 hours
1. Demonstration of basic principles of assessment of a surgical case.	
2. Demonstration of auscultation of cardiac and pulmonary system.	
3. Demonstration of techniques of breathing exercises.	
4. Demonstration of importance of various artificial airways.	
5. Demonstration of importance of different body positions.	
6. Demonstration of various scales to measure dyspnea.	
7. Demonstration of techniques of Airway clearance.	
8. Demonstration of exercise capacity.	
9. Demonstration of principles of cardiac rehabilitation	
10. Demonstration of principles of pulmonary rehabilitation	

#### Suggested Reading

11. Donna L. Frownfelter. Chest physical therapy & pulmonary rehabilitation: an interdisciplinary approach, Yearbook Medical Publishers, 1978, ISBN: 9780815132967
12. Egan's Fundamentals of Respiratory Care 11ed
13. Jennifer A. Pryor, Ammani S. Prasad. Physiotherapy for Respiratory and Cardiac Problems 4th revised

<b>Name of The Course</b>	Physiotherapy in cardiovascular, pulmonary & intensive care lab			
<b>Course Code</b>	<b>BPHP8006</b>			
<b>Prerequisite</b>				
<b>Co-requisite</b>				
<b>Anti-requisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	0	0	4	2

#### Course Objectives

To study

1. Common Investigations for cardiac and Pulmonary Disorders.
2. Evaluation, Clinical reasoning and Documentation for cardiac and pulmonary disorders and patients for general surgery.

#### Course Outcomes

CO1	Evaluate the patients with cardiac or pulmonary disorders.
CO2	To design and implement various physiotherapy techniques for cardiopulmonary patients.

edition, Churchill Livingstone, 2008, ISBN: 9780080449852

14. Tidys physiotherapy book
15. Joan E. Cash, Patricia Downie. Cash`s text book of General Medical & Surgical conditions for Physiotherapists, 2nd edition revised, , Mosby, ISBN: 978-0571140640
16. P J Mehta Practical medicine

<b>Name of The Course</b>	<b>Clinical Posting (Clinical reasoning &amp; Evidence based Physiotherapy Lab)</b>			
<b>Course Code</b>	<b>BPHP8011</b>			
<b>Prerequisite</b>				
<b>Corequisite</b>				
<b>Antirequisite</b>				
	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>0</b>	<b>0</b>	<b>16</b>	<b>8</b>

### Course Objectives

1.To sensitize potential learners with essential knowledge, this will lay a sound foundation for their learning across the under-graduate program and across their career.

2.To ensure the attention of a student and make the more receptive such as group activities, interactive for a role-plays and clinical bed-side demonstrations.

### Course Outcomes

<b>CO1</b>	Understanding physiotherapy healthcare service in a collaborative, ethical, client- centered and culturally responsive manner.
<b>CO2</b>	<b>Understanding the bedside assessment of a patient or to the course of the disease</b>
<b>CO3</b>	<b>Understanding of different departments in a hospital</b>
<b>CO4</b>	<b>Understanding basic knowledge of modality and its implementation.</b>
<b>CO5</b>	Understanding basic knowledge of exercise therapy and its implementation

### Continuous Assessment Pattern

<b>Internal Assessment (IA)</b>	<b>Continuous Assessment Test(CAT)</b>	<b>End Term Exam (ETE)</b>	<b>Total Marks</b>
<b>10</b>	<b>20</b>	<b>70</b>	<b>100</b>

### Course Contents:

<b>Unit-1</b>
<b>Demonstration of basic principles of application of evidence based physical therapy in treatment of various general Surgical, Neurological surgical procedures. Demonstration, justification and standardization to identify the most accurate diagnostic tests and the most effective interventions</b>
<b>Unit-2</b>
<b>The student will also be briefed regarding information about a patient's clinical status including signs, symptoms, and course of a disease</b>
<b>Unit-3</b>
<b>Clinical visit to their respective professional department within the hospital.</b>
<b>Unit-4</b>
<b>The students will learn about the construction and principle of working of various electrotherapeutic modalities and will be explained the indications, contraindications and harmful effects of the same. They will be taught to perform a check for all modalities. This will enable the students to apply these modalities for therapeutic purpose efficiently.</b>
<b>Unit-5</b>
<b>Develop the skills of the students in areas like assessment of physical parameters (joint range of motion, muscle strength etc) and principles of exercise therapy (strengthening, stretching, goniometry etc) and its application.</b>

<b>Unit 6</b> <b>8 hours</b>
<b>Hands on practice</b> <ul style="list-style-type: none"><li>• Mobilization</li><li>• Kinesiology taping</li><li>• Mulligan techniques</li><li>• Maitland techniques</li></ul>
<b>Topic presentation</b> <ul style="list-style-type: none"><li>• Case presentation</li><li>• Presentation on new researches in the field of physiotherapy</li> <li>• <b>workshop to be attended on</b></li> <li>• Recent advances &amp; techniques in the field of physiotherapy</li> <li>• Cardiopulmonary rehabilitation</li> <li>• Neurological rehabilitation</li> <li>• Physiotherapy rehabilitation</li></ul>

**Text Book (s):**

- Textbook of rehabilitation by S. Sunders
  
- **Tidy's Physiotherapy, 12th edition, Ann M. Thomson, Alison T. Skinner, Joan Piercy, Butterworth-Heinemann, 1991, ISBN: 978-0750613460**