



**SWAMI VIVEKANANDA UNIVERSITY**  
Telinipara, Barasat-Barrackpore Road, Bara Kanthalia, WB - 700121  
School of Allied Health Sciences  
Bachelor of Physiotherapy (BPT)  
Programme Structure 2021  
(As per UGC CBCS Template)

.....  
**Duration:** 4½ Years  
**Total Credit:** 196  
**Total Marks:** 5700  
.....

**Semester -I**

| Course Code  | Course Name  | L - T - P | Credits   | Course Type | Total Marks |
|--------------|--|-----------|-----------|-------------|-------------|
| HU101        | Communicative English  | 3-1-0     | 4         | AECC1       | 100         |
| BPTC101      | Basic Human Anatomy  | 4-0-0     | 4         | Core Course | 100         |
| BPTC191      | Basic Human Anatomy- Practical   | 0-0-4     | 2         | Core Course | 100         |
| BPTC102      | Basic Human Physiology   | 4-0-0     | 4         | Core Course | 100         |
| BPTC192      | Basic Human Physiology- Lab  | 0-0-4     | 2         | Core Course | 100         |
| GE*          | Generic Elective-1 (Any one from the List of Generic Elective / Interdisciplinary Courses from other Subjects) | 4-0-0     | 4         | GE1         | 100+100     |
| GE*          | Generic Elective-1 Lab   | 0-0-4     | 2         | GE1         |             |
| <b>TOTAL</b> |  |           | <b>22</b> |             | <b>700</b>  |

**Semester -II**

| Course Code | Course Name                     | L - T - P | Credits | Course Type | Total Marks |
|-------------|---------------------------------|-----------|---------|-------------|-------------|
| EVS201      | Environmental Science           | 3-1-0     | 4       | AECC2       | 100         |
| BPTC201     | Applied Human Anatomy           | 4-0-0     | 4       | Core Course | 100         |
| BPTC291     | Applied Human Anatomy Practical | 0-0-4     | 2       | Core Course | 100         |
| BPTC202     | Applied Human Physiology        | 4-0-0     | 4       | Core Course | 100         |



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|              |  |       |           |             |            |
|--------------|--|-------|-----------|-------------|------------|
| BPTC292      | Applied Human Physiology-Lab   | 0-0-4 | 2         | Core Course | 100        |
| BPTC203      | Biochemistry   | 3-1-0 | 4         | Core Course | 100        |
| GE*          | Generic Elective-2 (Any one from the List of Generic Elective / Interdisciplinary Courses from other Subjects) | 5-1-0 | 6         | GE2         | 100        |
| <b>TOTAL</b> |  |       | <b>26</b> |             | <b>800</b> |

**Semester -III**

| <b>Course Code</b> | <b>Course Name</b>   | <b>L - T - P</b> | <b>Credits</b> | <b>Course Type</b> | <b>Total Marks</b> |
|--------------------|--|------------------|----------------|--------------------|--------------------|
| BPTC301            | Pathology and Microbiology   | 4-0-0            | 4              | Core Course        | 100                |
| BPTC391            | Pathology and Microbiology Lab   | 0-0-4            | 2              | Core Course        | 100                |
| BPTC302            | Basics of Biomechanics & Kinesiology   | 4-0-0            | 4              | Core Course        | 100                |
| BPTC392            | Basics of Biomechanics & Kinesiology Practical   | 0-0-4            | 2              | Core Course        | 100                |
| BPTC303            | Pharmacology   | 4-0-0            | 4              | Core Course        | 100                |
| BPTC304            | Psychology   | 3-1-0            | 4              | Core Course        | 100                |
| GE*                | Generic Elective-2 (Any one from the List of Generic Elective / Interdisciplinary Courses from other Subjects) | 5-1-0            | 6              | GE3                | 100                |
| <b>TOTAL</b>       |  |                  | <b>26</b>      |                    | <b>700</b>         |



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**Semester –IV**

| Course Code  | Course Name  | L - T - P | Credits   | Course Type | Total Marks |
|--------------|--|-----------|-----------|-------------|-------------|
| BPTC401      | Fundamental of Exercise therapy  | 4-0-0     | 4         | Core Course | 100         |
| BPTC491      | Fundamental of Exercise therapy Practical  | 0-0-4     | 2         | Core Course | 100         |
| BPTC402      | Fundamental of Electro therapy   | 4-0-0     | 4         | Core Course | 100         |
| BPTC492      | Fundamental of Electro therapy Practical   | 0-0-4     | 2         | Core Course | 100         |
| BPTC403      | Applied Biomechanics & Kinesiology   | 3-1-0     | 4         | Core Course | 100         |
| BPTC404      | Sociology  | 3-1-0     | 4         | Core Course | 100         |
| GE*          | Generic Elective-4 (Any one from the List of Generic Elective / Interdisciplinary Courses from other Subjects) | 5-1-0     | 6         | GE4         | 100         |
| <b>TOTAL</b> |  |           | <b>26</b> |             | <b>700</b>  |

**Semester –V**

| Course Code | Course Name                        | L - T - P | Credits | Course Type | Total Marks |
|-------------|------------------------------------|-----------|---------|-------------|-------------|
| BPTC501     | Applied Exercise therapy           | 4-0-0     | 4       | Core Course | 100         |
| BPTC591     | Applied Exercise therapy Practical | 0-0-4     | 2       | Core Course | 100         |
| BPTC502     | Applied Electro therapy            | 4-0-0     | 4       | Core Course | 100         |
| BPTC592     | Applied Electro therapy Practical  | 0-0-4     | 2       | Core Course | 100         |



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|--------------|--|-------|-----------|-------------|------------|
| BPTC503      | Physical/ Functional Assessment & Applied Radiological Imaging | 4-0-0 | 4         | Core Course | 100        |
| BPTC593      | Physical/ Functional Assessment Practical                      | 0-0-4 | 2         | Core Course | 100        |
| BPTS581      | Clinical Observation   | 0-0-4 | 2         | SEC1        | 100        |
| <b>TOTAL</b> |  |       | <b>20</b> |             | <b>700</b> |

**Semester -VI**

| <b>Course Code</b> | <b>Course Name</b>  | <b>L - T - P</b> | <b>Credits</b> | <b>Course Type</b> | <b>Total Marks</b> |
|--------------------|---|------------------|----------------|--------------------|--------------------|
| BPTC601            | Orthopedics &Traumatology   | 4-0-0            | 4              | Core Course        | 100                |
| BPTC691            | Orthopedics &Traumatology Practical   | 0-0-4            | 2              | Core Course        | 100                |
| BPTC602            | General Surgery Including Cardio Thoracic Surgery, Plastic Surgery, Obstetrics and Gynecology           | 4-0-0            | 4              | Core Course        | 100                |
| BPTC692            | General Surgery Including Cardio Thoracic Surgery, Plastic Surgery, Obstetrics and Gynecology Practical | 0-0-4            | 2              | Core Course        | 100                |
| BPTC603            | General Medicine and Cardio thoracic condition and Pediatrics   | 4-0-0            | 4              | Core Course        | 100                |
| BPTC693            | General Medicine and Cardio thoracic condition and Pediatrics- Practical                                | 0-0-4            | 2              | Core Course        | 100                |
| <b>TOTAL</b>       |   |                  | <b>18</b>      |                    | <b>600</b>         |



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**Semester –VII**

| <b>Course Code</b> | <b>Course Name</b>  | <b>L - T - P</b> | <b>Credits</b> | <b>Course Type</b> | <b>Total Marks</b> |
|--------------------|---|------------------|----------------|--------------------|--------------------|
| BPTC701            | Neurology and Neurosurgery  | 4-0-0            | 4              | Core Course        | 100                |
| BPTC791            | Neurology and Neurosurgery<br>Practical   | 0-0-4            | 2              | Core Course        | 100                |
| BPTC702            | Physiotherapy in Surgery<br>Including Cardio Thoracic<br>Surgery, Plastic Surgery,<br>Obstetrics and Gynecology               | 4-0-0            | 4              | Core Course        | 100                |
| BPTC792            | Physiotherapy in Surgery<br>Including Cardio Thoracic<br>Surgery, Plastic Surgery,<br>Obstetrics and Gynecology-<br>Practical | 0-0-4            | 2              | Core Course        | 100                |
| BPTC703            | Physiotherapy in General<br>Medicine including Cardio<br>thoracic condition and<br>Pediatics                                  | 4-0-0            | 4              | Core Course        | 100                |
| BPTC793            | Physiotherapy in General<br>Medicine including Cardio<br>thoracic condition and<br>Pediatics - Practical                      | 0-0-4            | 2              | Core Course        | 100                |
| BPTS781            | Clinical Education I  | 0-0-4            | 2              | SEC2               | 100                |
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**Semester –VIII**

| Course Code  | Course Name  | L – T – P | Credits   | Course Type | Total Marks |
|--------------|--|-----------|-----------|-------------|-------------|
| BPTC801      | Physiotherapy in Orthopedics                           | 4-0-0     | 4         | Core Course | 100         |
| BPTC891      | Physiotherapy in Orthopedics- Practical                | 0-0-4     | 2         | Core Course | 100         |
| BPTC802      | Physiotherapy in Neurology and Neurosurgery            | 4-0-0     | 4         | Core Course | 100         |
| BPTC892      | Physiotherapy in Neurology and Neurosurgery- Practical | 0-0-4     | 2         | Core Course | 100         |
| BPTC803      | Community Based Rehabilitation                         | 3-1-0     | 4         | Core Course | 100         |
| BPTC804      | Research methodology and Biostatistics                 | 3-1-0     | 4         | Core Course | 100         |
| BPTS881      | Clinical Education II                                  | 0-0-4     | 2         | SEC3        | 100         |
| <b>TOTAL</b> |  |           | <b>22</b> |             | <b>700</b>  |

**Semester –IX**

| Course Code | Course Name | Duration | Credit | Course Type       | Total Marks |
|-------------|-------------|----------|--------|-------------------|-------------|
| BPTS981     | Internship  | 6 months | 16     | Skill Development | 100         |



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**Duration:** 4½ Years

**Total Credit:** 196

**Total Marks:** 5700  
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**Semester -I**

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|--------------|--|-----------|-----------|------------------------|-------------|
| HU101        | Communicative English                      | 3-1-0     | 4         | AECC1                  | 100         |
| BPTC101      | Basic Human Anatomy                        | 4-0-0     | 4         | Core Course            | 100         |
| BPTC191      | Basic Human Anatomy- Practical             | 0-0-4     | 2         | Core Course            | 100         |
| BPTC102      | Basic Human Physiology                     | 4-0-0     | 4         | Core Course            | 100         |
| BPTC192      | Basic Human Physiology- Lab                | 0-0-4     | 2         | Core Course            | 100         |
| BPTG103      | Health Promotion, Fitness and Wellness     | 4-0-0     | 4         | Generic Elective (GE1) | 100+100     |
| BPTG193      | Health Promotion, Fitness and Wellness Lab | 0-0-4     | 2         | Generic Elective (GE1) |             |
| <b>TOTAL</b> |  |           | <b>22</b> |                        | <b>700</b>  |



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**DETAILED SYLLABUS**

**Semester I**

**Paper: BASIC HUMAN ANATOMY**

**Code: BPTC101**

**Contacts Hours / Week: 4**

**Credits: 4**

**Course Contents**

**Module 1: [2H]**

**Introduction to human anatomy:**

Anatomy: Definition and its relevance

Planes of the body, relationship of structures, organ system

**Module 2: [12H]**

**General anatomy:**

**Histology**-Cell, tissues of the body, epithelium, connective tissue, cartilage, bone, lymph, muscle, nerve etc.

**Osteology**-Type of Bone, Growing End, Ossification Centers, Formation, function, growth and repair of bones.

**General Embryology**-Ovum, spermatozoa, fertilization, differentiation, development of various systems and foetal circulation.

**4. Nervous tissue:** Structure of neuron, Synapse, reflex arc, Wallerian Degeneration and regeneration of nerve

**5. Muscles:** classification, examples, microscopic features, emphasis on Skeletal Muscles

**6. Joints:** Definition, general classification with examples

**Module 3: [12H]**

**Systems of human body (a brief outline):**

**1. Blood Vascular System** – Arteries, capillaries, veins, heart, and lymphatic system.

**Respiratory System** – Anatomy of upper and lower respiratory tract including nose, larynx, trachea, bronchi, pleura and lungs.

**2. Digestive System** – Anatomy of the gastro-intestinal tract.

**3. Urogenital System** – Anatomy of Urinary system, male and female reproductive system.

**Endocrine System** – The various organs and production of hormones including definition, structures in general, control of secretions and role of hypothalamus.

**4. Integumentary System**

**Module 4: [10H]**

**Musculo Skeletal Anatomy -**

a) Anatomical positions of body, axes, planes, common anatomical terminologies (Groove, tuberosity, trochanters etc)



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- b) Connective tissue classification.
- c) Bones- Composition & functions, classification and types according to morphology and development.
- d) Joints-definition-classification, structure of fibrous, cartilaginous joints, blood supply **and** nerve supply of joints.
- e) Muscles – origin, insertion, nerve supply and actions

**Module 5: [12H]**

**UPPER EXTREMITY**

**i) Osteology**

- Outline the anatomical features, attachments, ossification and side determination of the bones of Upper Limb: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges

**ii) Myology**

- Fascia and Muscles of front and back of upper arm: origin, insertion, nerve supply and action.
- Muscles of front and back of forearm: origin, insertion, nerve supply and action.
- Mention the small muscles of hand with their origin, insertion, nerve supply and action.
- Identify the nerves of upper units and mention their position course, relations and distribution.
- Detail explanation of joints of upper limb: Scapulothoracic Joint, Shoulder joint, Elbow Joint, Wrist and joints of hand.
- Indicate the blood vessels of upper limb and mention their position course, relations, distribution and main branches.
- Lymphatic damage of upper limb
- Applied anatomy of all structures of Upper Limb

**Paper: BASIC HUMAN ANATOMY- PRACTICAL**

**Code: BPTC191**

**Contacts Hours / Week: 4**

**Credits: 2**

**Module 1: [8H]**

Surface Anatomy: To study, identify and mark the surface land marks on humanbody.

**Module 2: [8H]**

To study the muscles of trunk, upper extremities and face of a human body.

**Module 3: [8H]**

To study the Bones of Human Body with special emphasis on origin and insertion of muscles and ligaments.

**Module 4: [8H]**



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To study the anatomy of joints of upper extremities and vertebral column of models, charts.

**Module 5: [8H]**

To study the anatomy of C.N.S and P.N.S on models, charts.

**Module 6: [8H]**

To study the gross anatomy of Respiratory, Digestive, Endocrine, Urinary and Genital system on models, charts.

**Learning Outcomes:** It is designed to provide students with the working knowledge of the structure of the human body which is essential foundation for their clinical studies.

***Suggested Readings:***

**TEXT BOOKS: -**

1. B.D. CHAURASIA: Handbook of General Anatomy, 2<sup>nd</sup> Ed., CBS Publishers and Distributors, New Delhi - 110 032.
2. SIBANI MAZUMDAR: ANATOMY at a Glance- An Exam-Oriented Text, 2<sup>nd</sup> Ed, Jaypee.
3. PETER L. WILLIAMS AND ROGER WARWICK: - Gray's Anatomy - Descriptive and Applied, 36th Ed., 1980, ChurchillLivingstone.
4. R. KANAGASUNTHARAM, P. SIVANANDA-SINGHAM & A. KRISHNAMURTI: Anatomy- Regional, Functional, & Clinical, P.G. Publisher, Singapore 1987.



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**Paper: BASIC HUMAN PHYSIOLOGY**

**Code: BPTC102**

**Contacts Hours / Week: 4**

**Credits: 4**

**Course Contents**

**Module 1: [7H]**

Introduction on Physiology

- a. Cell: Morphology. Organelles: their structure and functions
- b. Transport Mechanisms across the cell membrane
- c. Body fluids: Distribution, composition.

**Module 2: [8H]**

Blood

- a. Introduction: Composition and functions of blood.
- b. Plasma: Composition, formation, functions. Plasma proteins.
- c. RBC: count and its variations. Erythropoiesis- stages, factors regulating. Reticulo-endothelial system (in brief) Haemoglobin –structure, function and derivatives Anemia (in detail), types of Jaundice. Blood indices, PCV, ESR.
- d. WBC: Classification. Morphology, functions, count, its variation of each. Immunity
- e. Platelets: Morphology, functions, count, its variations
- f. Hemostatic mechanisms: Blood coagulation–factors, mechanisms. Their disorders. Anticoagulants.
- g. Blood Groups: Landsteiner’s law. Types, significance, determination, Erythroblastosis foetalis.
- h. Blood Transfusion: Cross matching. Indications and complications.
- i. Lymph: Composition, formation, circulation and functions.

**Module 3: [8H]**

**Cardio Vascular System:**

Structure and properties of Heart muscles and nerve supply of Heart. Structure and functions of arteries, capillaries and veins, Cardiac cycle and Heart sound, Factors affecting Heart Rate and its regulation, Cardio-vascular reflexes, Blood pressure and its regulation, physiological variation, peripheral resistance, Factors controlling Blood Pressure, Haemorrhage



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**Module 4: [9H]**

**Respiratory System:**

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

**Module 5: [7H]**

**Gastro-intestinal System:**

General arrangement, Salivary digestion –functions & regulations, Gastric digestion –functions & regulations, Pancreatic digestion –functions & regulations Intestinal digestion – functions & regulations, Liver & bile, Functions of large intestine, Neurohumoral regulations of alimentary functions, summary

**Module 6: [7H]**

**Reproductive System:**

Development of Puberty, Male Sex Hormones, Spermatogenesis, Female Sex Hormones, Menstrual cycle, Ovulation, Pregnancy and Lactation, Function of Placenta



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**Module 7: [7H]**

**Excretory System:**

Gross and minute structures of kidney, renal circulation, mechanism of formation of urine. Glomerular filtration rate and tubular function, renal function.

**Module 8: [7H]**

**Endocrine System:**

Structure and function of pituitary (anterior and posterior) gland, Thyroid, Para-Thyroid, Adrenal Cortex, Adrenal Medulla, Thymus and Pancreas, Blood Sugar regulation

**Paper: BASIC HUMAN PHYSIOLOGY LAB**

**Code: BPTC192**

**Contacts Hours / Week: 4**

**Credits: 2**

**Module 1: [5H]**

Introduction of Microscope and Microscopy

**Module 2: [5H]**

Identification of blood cells and different counts

**Module 3: [5H]**

White Blood Cell Count, Red Blood Cell Count, Bleeding time and Clotting time, Haemoglobin percentage

**Module 4: [5H]**

E.S.R. and Blood groups.

**Module 5: [5H]**

Respiratory rate and Auscultation.

**Module 6: [5H]**

Pulse rate, Heart rate and Measurement of Blood Pressure.



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**Learning Outcomes:** The course in Physiology over the first year is designed to give the student an in-depth knowledge of fundamental reactions of living organisms, particularly in the human body. The major topics covered include the following: the cell; primary tissue; connective tissue; skin; muscle; nervous tissue; blood; lymphoid tissues; respiration; blood vessels; circulation; cardiac cycle; systemic circulation; gastrointestinal tract; kidneys; uterus; urinary tract; pregnancy; endocrine system.

***Suggested Readings:***

**TEXT BOOKS: -**

1. A.B. Singha Mahapatra, Essential of Medical Physiology, 5th Edition, Current Books International.
2. Sujit K. Chaudhuri, Concise Medical Physiology, 6th edition, New Central Book Agency, Kolkata, 2008
3. Essentials of Medical Physiology by K Sembulingam 8th edition

**REFERENCE BOOKS: -**

1. AK Khurana, InduKhurana: Anatomy and Physiology of Eye, Second edition, CBS Publishers, New Delhi, 2006
2. A C Guyton: Text book of Medical Physiology, 8th edition, saunders company



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**Paper: HEALTH PROMOTION, FITNESS AND WELLNESS**

**Code: BPTG103**

**Contacts hours / week: 4**

**Credits: 4**

**Course Contents**

**Module 1: [6H]**

Prevention practice: a holistic perspective for physiotherapy

- a. Defining Health
- b. Predictions of Health Care
- c. Comparing Holistic Medicine and Conventional Medicine
- d. Distinguishing Three Types of Prevention Practice.
- e. Prevention practice for musculoskeletal and neuromuscular conditions
- f. Prevention practice for cardiopulmonary and integumentary conditions

**Module 2: [6H]**

Healthy People

- a. Definition of healthy people
- b. Health education Resources
- c. Physiotherapist role for a healthy community.

**Module 3: [6H]**

Key concepts of fitness

- a. Defining & Measuring Fitness
- b. Assessment of Stress with a Survey
- c. Visualizing Fitness
- d. Screening for Mental and Physical Fitness
- e. Body Mass Index calculations.

**Module 4: [6H]**

Fitness training

- a. Physical Activities Readiness Questionnaire
- b. Physical Activities Pyramid
- c. Exercise Programs
- d. Evidence-Based Practice.

**Module 5: [6H]**

Health, fitness, and wellness issues during childhood and adolescence

- a. Prevention practice for individuals with developmental disabilities



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| <b>Module 6: [6H]</b><br>Health, fitness, and wellness during adulthood                                 |
| <b>Module 7: [6H]</b><br>Women's health issues: focus on pregnancy                                      |
| <b>Module 8: [6H]</b><br>Prevention practice for older adults   |
| <b>Module 9: [6H]</b><br>Resources to optimize health and wellness<br>a. Marketing health and wellness. |
| <b>Module 10: [6H]</b><br>Health protection   |

**Learning Outcomes:** This course includes discussion on the theories of health and wellness, including motivational theory, locus of control, public health initiative, and psycho-Social, spiritual and cultural consideration. Health risks, screening, and assessment considering epidemiological principles are emphasized. Risk reduction strategies for primary and secondary prevention, including programs for special populations are covered.

**Paper: HEALTH PROMOTION, FITNESS AND WELLNESS-Lab**

**Code: BPTG193**

**Contacts hours / week: 4**

**Credits: 2**

**Course Contents**

**Course Contents**

**PRACTICAL [30H]-** Practical shall be conducted for all the relevant topics discussed in theory.



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(As per UGC CBCS Template)

.....  
**Duration:** 4½ Years

**Total Credit:** 196

**Total Marks:** 5700  
.....

**Semester -II**

| Course Code  | Course Name                     | L - T - P | Credits   | Course Type            | Total Marks |
|--------------|---------------------------------|-----------|-----------|------------------------|-------------|
| EVS201       | Environmental Science           | 3-1-0     | 4         | AECC2                  | 100         |
| BPTC201      | Applied Human Anatomy           | 4-0-0     | 4         | Core Course            | 100         |
| BPTC291      | Applied Human Anatomy Practical | 0-0-4     | 2         | Core Course            | 100         |
| BPTC202      | Applied Human Physiology        | 4-0-0     | 4         | Core Course            | 100         |
| BPTC292      | Applied Human Physiology-Lab    | 0-0-4     | 2         | Core Course            | 100         |
| BPTC203      | Biochemistry                    | 3-1-0     | 4         | Core Course            | 100         |
| BPTG204      | Physiotherapy Law and Ethics    | 5-1-0     | 6         | Generic Elective (GE2) | 100         |
| <b>TOTAL</b> |                                 |           | <b>26</b> |                        | <b>800</b>  |



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.....  
**Duration:** 4½ Years

**Total Credit:** 196

**Total Marks:** 5700  
.....

**DETAILED SYLLABUS**

**Semester II**

**Paper: APPLIED HUMAN ANATOMY**

**Code: BPTC201**

**Contacts Hours / Week: 4**

**Credits: 4**

**Course Contents**

**Module 1: [15H]**

**TRUNK-THORAX & ABDOMEN**

**i) Osteology**

– Vertebral columns: Identify the parts of typical vertebra and state the main features, attachments and ossification.

– Intervertebral disc and mention its part.

– Ribs: Parts and main features of typical rib and define true, false and floating ribs.

– Sternum: State the parts and anatomical features.

**ii) Myology**

– Fascia and muscles of back

– Fascia and muscles connecting Upper Limb with vertebral column: origin, insertion, nerve supply and action.

– Intercostal muscles and diaphragm: origin, insertion, nerve supply and action.

– List layers of anterior abdominal wall and mention its origin, insertion, nerve supply and action of these muscles.

– Fascia and muscles of posterior abdominal wall: origin, insertion, nerve supply and action.

**iii) Joints of Thorax**

Identify the various joints and explain in detail:

– Manubriosternal joint

– Costo vertebral joint

– Costo transverse joint

– Costo Chondral joint

– Chondro sternal joints

– Inter vertebral joint

– Movements of vertebral column

– Respiratory movements

• Mention the course and branches and nerves, blood vessels and lymphatic drainage of trunk-thorax-abdomen.

• Lumbar Plexus: Position, formation and branches.



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- Rectus sheath: formation and contents.
- Contents of vertebral canal
- Intercostal space and its contents
- Diaphragm-structures passing through it.
- Applied Anatomy of structures of trunk – thorax – abdomen

**Module 2: [15H]**

**PELVIS**

- Features of pubic symphysis and sacroiliac joints.
- Muscles of pubic floor and mention their attachments, action and nerve supply.
- Difference between male and female pelvis.
- Main features of subdivision, boundaries, walls and floor of pelvis.
- Urogenital diaphragm (outlines only)
  - Applied anatomy of plexus
  - Lymphatic damage
  - Nerve supply
  - Sacral Plexus
  - Mention the blood vessels of the region with course, variations, distribution and main branches.

**Module 3: [15H]**

**LOWER EXTREMITY**

**i) Osteology**

- Hip bone, femur, Tibia, Fibula, Patella, and bones of the foot

**ii) Myology**

- Fascia and muscles in front of thigh: Origin, Insertion, Nerve Supply, and Action
- Fascia and muscles of medial side of thigh: Origin, Insertion, Nerve Supply, and Action
- Fascia and muscles of back of thigh
- Fascia and muscles of gluteal region
- Fascia and muscles of front of leg and dorsum of foot
- Fascia and muscles of lateral side of leg
- Fascia and muscles of back of leg and role of foot
- Detailed explanation of joints of Lower Leg: Pelvic Girdle, Hip joint, Knee joint, Ankle joint, joints of foot.
- Study of the nerves of Lower Leg and mention their position course, relations and distribution
- Indicate the blood vessels of Lower Leg a mention their position course, relation, distribution and main branches
- Lymphatic drainage of Lower Leg
- Explain femoral triangle, Adductor Canal and Subsartorial canal
- Poptileal fossa
- Anatomy of structures of Lower Leg, Arch of Foot



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**Module 4: [15H]**

**NEURO-ANATOMY: MICROSCOPIC AND GROSS STUDY OF: -**

Peripheral Nerves, Cranial Nerves, Autonomic Nervous System, Cerebral Cortex, Midbrain, Pons, Medulla, Cerebellum, Thalamus, Hypothalamus, Epithalamus, Corpus Striatum, Ventricles, Meninges, Cerebro Spinal Fluid, Blood supply of the Brain, Internal Capsule, Pyramidal System and Extrapyramidal System, Details of Spinal Cord and its Tracts, Neuromuscular Junction, Sensory End Organs etc.

**Paper: APPLIED HUMAN ANATOMY PRACTICAL**

**Code: BPTC291**

**Contacts Hours / Week: 4**

**Credits: 2**

**Module 1: [5H]**

Upper extremity including surface Anatomy.

**Module 2: [5H]**

Lower extremity including surface Anatomy.

**Module 3: [5H]**

Head & Spinal cord and Neck and Brain including surface Anatomy.

**Module 4: [5H]**

Thorax including surface anatomy, abdominal muscles.

**Module 5: [5H]**

Histology-Elementary tissue including surface Anatomy.

**Module 6: [5H]**

Embryology-models, charts & X-rays.

**Learning Outcomes:** Studies are concerned with the topographical and functional anatomy of the limbs and thorax. Particular attention is paid to the muscles, bones and joints of the regions. The head and neck and central nervous system (CNS) are studied with particular reference to topics of importance to physiotherapists. The study of the CNS includes detailed consideration of the control of motor function.



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***Suggested Readings:***

**TEXT BOOKS: -**

1. B.D. CHAURASIA: Handbook of General Anatomy, 2<sup>nd</sup> Ed., CBS Publishers and Distributors, New Delhi - 110 032.
2. SIBANI MAZUMDAR: ANATOMY at a Glance- An Exam-Oriented Text, 2<sup>nd</sup> Ed, Jaypee.
3. PETER L. WILLIAMS AND ROGER WARWICK: - Gray's Anatomy - Descriptive and Applied, 36th Ed., 1980, Churchill Livingstone.
4. R. KANAGASUNTHARAM, P. SIVANANDA-SINGHAM & A. KRISHNAMURTI: Anatomy- Regional, Functional, & Clinical, P.G. Publisher, Singapore 1987.

**Paper: APPLIED HUMAN PHYSIOLOGY**

**Code: BPTC202**

**Contacts Hours / Week: 4**

**Credits: 4**

**Course Contents**

**Module 1: [30H]**

Nerve Muscle Physiology

- a. Introduction: Resting membrane potential. Action potential – ionic basis and properties.
- b. Nerve: Structure and functions of neurons. Classification, Properties and impulse transmission of nerve fibers. Nerve injury – degeneration and regeneration.
- c. Neuroglia: Types and functions.
- d. Muscle: Classification. Skeletal muscle: Structure. Neuromuscular junction: Structure. Neuromuscular and synaptic transmission, myasthenia gravis. Excitation- Contraction coupling. Rigor mortis.

**Module 2: [30H]**

**Nervous System:**

Gross and microscopic structure of nervous tissue, One Neurone- generation of action potential- nerve impulse- conduction, Neuromuscular Junction, Degeneration, regeneration of peripheral nerves, Wallerian Degeneration, Electro tonus and Pflagers law.

Types and properties of receptors, types of sensations, synaptic reflex arc and its properties – occlusion, summation, subminimal fatigue etc

Nuclei of Spinal Cord, Tracts – Ascending and Descending tracts of the spinal cord



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|  |
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| Structure and Functions of Cerebral Cortex, Cerebrum, Cerebellum, Basal Ganglia, Thalamus, Hypothalamus<br>Reticular Formation: Tone, Posture and Equilibrium<br>Autonomic Nervous System<br>Special Senses: Eye, Ear, vestibular apparatus, taste, olfactory and somatic sensations<br>Speech and its Disorders, Memory Consolidation and Emotion<br>CSF, Patch clamp Technique |
|--|

**Paper: APPLIED HUMAN PHYSIOLOGY-LAB**

**Code: BPTC292**

**Contacts Hours / Week: 4**

**Credits: 2**

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| <b>Module 1: [5H]</b> |
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| Reflexes – Superficial and Deep Sensations |
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| <b>Module 2: [5H]</b> |
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| Tests for functions of Cerebrum |
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| <b>Module 3: [5H]</b> |
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| Tests for functions of Cerebellum |
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| <b>Module 4: [5H]</b> |
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| Examination of cranial nerves |
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| <b>Module 5: [5H]</b> |
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| Examination of Motor System |
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| <b>Module 6: [5H]</b> |
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| Examination of Sensory system |
|-------------------------------|

**Learning Outcomes:** More detailed study of the physiology and practical applications of the following selected topics with emphasis on aspects, which should help in understanding the nature and treatment of common clinical situations of interest in Physiotherapy.



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***Suggested Readings:***

**TEXT BOOKS: -**

1. A.B. Singha Mahapatra, Essential of Medical Physiology, 5th Edition, Current Books International.
2. Sujit K. Chaudhuri, Concise Medical Physiology, 6th edition, New Central Book Agency, Kolkata, 2008
3. Essentials of Medical Physiology by K Sembulingam 8th edition

**REFERENCE BOOKS: -**

1. AK Khurana, InduKhurana: Anatomy and Physiology of Eye, Second edition, CBS Publishers, New Delhi, 2006
2. A C Guyton: Text book of Medical Physiology, 8th edition, saunders company

**Paper: BIOCHEMISTRY**

**Code: BPTC203**

**Contacts Hours / Week: 4**

**Credits: 4**

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|---|
| <b>Module 1: [4H]</b><br>Biophysics: Concepts of PH and buffers, Acid-base equilibrium, osmotic pressure and its physiological applications.  |
| <b>Module 2: [4H]</b><br>Carbohydrate: - Definition, functions, sources, classification, monosaccharide, Disaccharides, Polysaccharides, Muco-polysaccharides and its importance.   |
| <b>Module 3: [5H]</b><br>Lipid: - Definition, functions, sources, classification, simple lipids, compound lipids, derived lipids, Saturated and unsaturated fatty acids, Essential fatty acids and their importance, Blood lipids and their implications, cholesterol and its importance. |
| <b>Module 4: [4H]</b><br>Proteins: - Definition, Sources, Functions, Classification, simple protein, congregated proteins and derived proteins properties and reactions of proteins.  |
| <b>Module 5: [4H]</b><br>Nucleic acids: - Structure and functions of DNA, RNA, Nucleosides, Nucleotides, biologically important Nucleotides including energy rich compounds.  |
| <b>Module 6: [4H]</b><br>Enzymes: - Definition, Classification, mode of action, factors, affection, enzyme action.  |



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|---|
| <b>Module 7: [5H]</b><br>Vitamins: - Classification, Fat-soluble vitamins A, D, E, K Water soluble vitamins-B Complex and Vitamin C. Daily requirement physiological functions and disease of vitamin deficiency. |
| <b>Module 8: [5H]</b><br>Carbohydrate Metabolism: Glycolysis, TCA Cycle, Glycogenesis, Glycogenolysis, Gluconeogenesis, maintenance of Blood glucose, Inter conversion of different sugars.                       |
| <b>Module 9: [5H]</b><br>Lipid metabolism: Metabolism of cholesterol, Ketone bodies, Athero-sclerosis and obesity, Lipo Protein of their metabolism.  |
| <b>Module 10: [4H]</b><br>Protein metabolism: Transamination, Transmethylation, Deamination, Fate of Ammonia Urea synthesis and synthesis of creatinine, inborn errors of metabolisms.                            |
| <b>Module 11: [4H]</b><br>Bio-energetic: Respiratory chain and Biological oxidation.  |
| <b>Module 12: [4H]</b><br>Mineral metabolism: Iron, Calcium, Phosphorous, Trace elements.   |
| <b>Module 13: [4H]</b><br>Water and electrolytes: Fluid compartments, Daily intake and out- put, Dehydration, Sodium and potassium metabolism.  |
| <b>Module 14: [4H]</b><br>Nutrition: Nutritional aspects of carbohydrate, fat and proteins, Balanced diet, metabolism in exercise and injury. Diet for chronically ill and terminally ill patients.               |

***Suggested Readings:***

**TEXT BOOKS: -**

1. Text Book of Medical Biochemistry- Chatterji, M N, Jaypee, Bangalore
2. Text Book of Medical Biochemistry- U Satyanarayana and U Chakrapani
3. CBS Quick Review in Biochemistry- Ahuja, Lakshmi, CBS, New Delhi

**REFERENCE BOOKS: -**

1. Principles of Biochemistry- Lehninger, A.L.
2. Biochemistry by U Satyanarayana



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**Paper: PHYSIOTHERAPY LAW AND ETHICS**

**Code: BPTG204**

**Contacts Hours / Week: 5L+1T**

**Credits: 6**

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| <b>Module 1: [3H]</b><br>Medical ethics versus medical law - Definition - Goal – Scope   |
| <b>Module 2: [3H]</b><br>Introduction to Code of conduct   |
| <b>Module 3: [3H]</b><br>Basic principles of medical ethics – Confidentiality  |
| <b>Module 4: [3H]</b><br>Malpractice and negligence - Rational and irrational drug therapy   |
| <b>Module 5: [4H]</b><br>Autonomy and informed consent - Right of patients   |
| <b>Module 6: [4H]</b><br>Care of the terminally ill- Euthanasia  |
| <b>Module 7: [4H]</b><br>Organ transplantation   |
| <b>Module 8: [4H]</b><br>Medical diagnosis versus physiotherapy diagnosis.   |
| <b>Module 9: [4H]</b><br>Medico legal aspects of medical records – Medico legal case and type- Records and document related to MLC - ownership of medical records - Confidentiality Privilege communication - Release of medical information - Unauthorized disclosure - retention of medical records - other various aspects. |
| <b>Module 10: [4H]</b><br>Professional Indemnity insurance policy  |
| <b>Module 11: [4H]</b><br>Development of standardized protocol to avoid near miss or sentinel events   |
| <b>Module 12: [4H]</b><br>Obtaining an informed consent.   |
| <b>Module 13: [4H]</b><br>Biomedical ethical principles  |
| <b>Module 14: [4H]</b><br>Code of ethics for physiotherapists  |



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**Module 15: [4H]**

Ethics documents for physiotherapists

**Module 16: [4H]**

Laws affecting physiotherapy practice

**Learning Outcomes:** Legal and ethical considerations are firmly believed to be an integral part of medical practice in planning patient care. Advances in medical sciences, growing sophistication of the modern society's legal framework, increasing awareness of human rights and changing moral principles of the community at large, now result in frequent occurrences of healthcare professionals being caught in dilemmas over aspects arising from daily practice.

***Suggested Readings:***

**TEXT BOOKS: -**

1. Physical Therapy Ethics 2nd edition by Gabard & Martin, F.A Davis



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**Duration:** 4½ Years

**Total Credit:** 196

**Total Marks:** 5700  
.....

**Semester -III**

| Course Code  | Course Name  | L - T - P | Credits   | Course Type      | Total Marks |
|--------------|--|-----------|-----------|------------------|-------------|
| BPTC301      | Pathology and Microbiology   | 4-0-0     | 4         | Core Course      | 100         |
| BPTC391      | Pathology and Microbiology Lab   | 0-0-4     | 2         | Core Course      | 100         |
| BPTC302      | Basics of Biomechanics & Kinesiology   | 4-0-0     | 4         | Core Course      | 100         |
| BPTC392      | Basics of Biomechanics & Kinesiology Practical   | 0-0-4     | 2         | Core Course      | 100         |
| BPTC303      | Pharmacology   | 4-0-0     | 4         | Core Course      | 100         |
| BPTC304      | Psychology   | 3-1-0     | 4         | Core Course      | 100         |
| BPTG305      | Generic Elective-3 (Any one from the List of Generic Elective / Interdisciplinary Courses from other Subjects) | 5-1-0     | 6         | Generic Elective | 100         |
| <b>TOTAL</b> |  |           | <b>26</b> |                  | <b>700</b>  |



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**Total Credit:** 196

**Total Marks:** 5700  
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**DETAILED SYLLABUS**

**Semester III**

**Paper: PATHOLOGY AND MICROBIOLOGY**

**Code: BPTC301**

**Contacts Hours / Week: 4**

**Credits: 4**

**Course Contents**

**Module 1: [18H]**

**General Pathology:**

**1. Introduction to Pathology**

**2. Aims and objectives of the study of pathology-** Meaning of terms, etiology, pathogenesis and lesions

**3. Causes of disease and cell injury** – features of cell injury, mechanism of cell injury – hypoxia, free radical injury. Necrosis and gangrene

**4. Inflammation and Repair -**

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

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

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

Healing in specific site including bone healing.

**5. Fluid and hemodynamic derangements** – oedema, hyperemia, Hemorrhage, shock, embolism, thrombosis, infarction

**6. Immunity** – natural and acquired immunological mechanisms of tissue injury, hypersensitivity reactions, general features of autoimmune diseases and immunodeficiency diseases.

**7. Neoplasia-** characteristic of benign and malignant tumors, grading and staging of malignant tumors, a brief outline of the carcinogenic agents and methods of diagnosis of malignancy and general effects of malignancy on the host

**8. Nutritional disorders-** deficiency disorders (protein deficiency, vitamin deficiency (A, B, C, D, E,) causes, features, a brief outline of the methods of diagnosis.



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**Module 2: [12H]**

**Systemic Pathology:** A brief outline of etiology, pathogenesis and general features of disease of the following systems. (The morphology, microscopic details and details of diagnostic procedures are not required).

**1. Blood:** Disorders of RBC, WBC and platelets,

Anemia types and pathogenesis

**2. Blood Vessels:** Atherosclerosis, thromboangitis obliterans, varicose vein, DVT, thrombophlebitis, lymphoedema

**3. Disease of Heart:** Congestive cardiac failure, ischemic heart disease, rheumatic heart disease, infective heart disease (pericarditis, myocarditis, endocarditis)

**4. Respiratory System:** Pneumonias, Bronchiectasis, Emphysema, Chronic bronchitis, Asthma, Tuberculosis, carcinoma of lungs etc.

**5. Joints Disorders:** Arthritis- types and their features.

**6. Bone Disorders:** Osteoporosis, Paget's disease, Osteogenesis Imperfecta, Osteomyelitis, tumors– Osteosarcoma, Chondrosarcoma, Ewing's sarcoma, Multiple myeloma (a brief outline only)

**7. Muscles:** Muscular dystrophy, Myasthenia gravis

**8. Nervous System:** Meningitis, encephalitis, vascular diseases of brain, poliomyelitis, nerve injuries

**9. Genetic Disorders**

Basic concepts of genetic disorders and some common examples and congenital malformation

**Module 3: [4H]**

An introduction to microbiology, Classification of microorganisms

**Module 4: [4H]**

Infection – Types, source, portals of entry, spread.

**Module 5: [4H]**

Prevention and control of infection, Disinfection and antiseptics Sterilization

**Module 6: [8H]**

An outline of the following infectious diseases with respect to the causative organism, mode of transmission, pathogenesis, prevention, and diagnostic tests (details of the execution and interpretation of the tests not required)

Chicken Pox, Measles, Mumps, Influenza, Diphtheria, Whooping Cough, Tetanus, Tuberculosis, Leprosy, Rubella, Cholera, Gastroenteritis, Food Poisoning, Hepatitis, AIDS, Typhoid, Rabies, STD, Amoebiasis, Kala Azar, Malaria, Filariasis

**Module 7: [5H]**

Basic principles of immunity immunobiology: lymphoid organs and tissues. Antigen, Antibodies, antigen and antibody reactions with relevance to pathogenesis and serological diagnosis.

Humoral immunity and its role in immunity Cell mediated immunity and its role in immunity.



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Immunology of hypersensitivity, Measuring immune functions.

**Module 8: [5H]**

General properties: Basic structure and broad classification of viruses. Pathogenesis and pathology of viral infections. Immunity and prophylaxis of viral diseases. Principles of laboratory diagnosis of viral diseases. List of commonly used antiviral agents.

**Paper: PATHOLOGY AND MICROBIOLOGY LAB**

**Code: BPTC391**

**Contacts Hours / Week: 4**

**Credits: 2**

**Course Contents**

**Module 1: [6H]**

Demonstration of Microscopes and its uses

**Module 2: [6H]**

Principles, uses and demonstration of common sterilization equipment

**Module 3: [6H]**

Demonstration of common culture media

**Module 4: [6H]**

Demonstration of Gram Stain, ZN Stain

**Module 5: [6H]**

Demonstration of Serological test: ELISA

**Learning Outcomes:** This subject follows the basic subjects of Anatomy, Physiology and Biochemistry and it forms a vital link between preclinical subjects and clinical subjects. Pathology involves the study of causes and mechanisms of diseases. Microbiology involves the study of common organisms causing diseases including nosocomial infections and precautionary measures to protect one from acquiring infections. The knowledge and understanding of Microbiology & Pathology of diseases is essential to institute appropriate treatment or suggest preventive measures to the patient. Particular effort is made in this course to avoid burdening the student.



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***Suggested Readings:***

**TEXT BOOKS: -**

1. Text book of pathology: Harshmohan
2. General systemic pathology: Churchill Livingstone
3. Text book of Pathology: Robbins
4. Short text book of Medical Microbiology by Sathish Gupta
5. Text book of Microbiology by Jayaram Panicker
6. Microbiology & Parasitology by Rajeshwar Reddy
7. Text book of Microbiology by Anantha Narayanan
8. Microbiology by Baveja
9. Text book of microbiology by Chakraborty

**Paper: BASICS OF BIOMECHANICS & KINESIOLOGY**

**Code: BPTC302**

**Contacts Hours / Week: 4**

**Credits: 4**

**Course Contents**

|   |
|---|
| <p><b>Module 1: [5H]</b><br/>Basic Concepts of Biomechanics<br/>a. <b>Kinematics:</b> Description of Motion, Types of Motion, Location of Motion, Direction and Magnitude of Motion<br/>b. <b>Kinetics:</b> Analysis of Forces, Definition, Force of Gravity, Reaction of Forces, Equilibrium, Objects in Motion, Force of Friction, Concurrent Force Systems, Parallel Force Systems, Work, Moment arm of Force, Force Components, Equilibrium of Levers</p> |
| <p><b>Module 2: [5H]</b><br/><b>Joint Structure and Function:</b> Joint Design, Specific connective tissue structures, General Properties of Connective Tissue, Human Joint Design, Kinematic Chains, Arthrokinematics and Osteokinematics</p>  |
| <p><b>Module 3: [5H]</b><br/><b>Muscle Structure and Function:</b> Mobility and Stability Functions of Muscles, Elements of Muscle Structure, Muscle Function, Effects of Immobilization, Injury and Aging on Muscle Tissues</p>  |



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| <p><b>Module 4: [5H]</b><br/><b>Biomechanics of Vertebral Column:</b> General structure and Function (Region wise), Mobility and Stability of Vertebral Column, Muscles of the Vertebral Column, Biomechanics pelvic girdle, General effects of Aging and Injury</p> |
| <p><b>Module 5: [6H]</b><br/><b>Biomechanics of Shoulder Complex:</b> Components of shoulder complex, Integrated Function of Shoulder Complex, Mobility and Stability of Shoulder Complex,</p>   |
| <p><b>Module 6: [6H]</b><br/><b>Biomechanics of Elbow Complex:</b> Structure and function of the Elbow Complex, Structure and Function of the superior and inferior Radio-ulnar Joints, Mobility and Stability of Elbow Complex.</p>                                 |
| <p><b>Module 7: [6H]</b><br/><b>Biomechanics of the Wrist and Hand Complex:</b> Structural components of the Wrist complex, function, structure and function of the Hand Complex, Finger Musculature, Functional Position of the Wrist and Hand</p>                  |
| <p><b>Module 8: [3H]</b><br/><b>Biomechanics of Temporomandibular Joint</b></p>  |
| <p><b>Module 9: [6H]</b><br/><b>Biomechanics of the Hip Complex:</b> Structure and Function of the Hip Joint, Arthrokinematics and Osteokinematics, Hip Joint Musculature, Stability, Muscle Function in Bilateral and Single leg Stance, Trabecular System</p>      |
| <p><b>Module 10: [6H]</b><br/><b>Biomechanics of the Knee Complex:</b> Structure and Function of the Tibiofemoral Joint, Static and Dynamic stability of Tibiofemoral Joint, Structure and Function of the Patellofemoral Joint, Stability of Patella</p>            |
| <p><b>Module 11: [6H]</b><br/><b>Biomechanics of the Ankle Complex:</b> Kinematics and Kinetics of the Tibiotalar Joint, Stability of the Ankle Joint, Arch of foot</p>  |



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**Paper: BASICS OF BIOMECHANICS & KINESIOLOGY PRACTICAL**

**Code: BPTC392**

**Contacts Hours / Week: 4**

**Credits: 2**

**Course Contents**

|   |
|---|
| <p><b>Module 1: [3H]</b></p> <p><b>Joint Structure and Function:</b> Joint Design, Specific connective tissue structures, General Properties of Connective Tissue, Human Joint Design, Kinematic Chains, Arthrokinematics and Osteokinematics</p>           |
| <p><b>Module 2: [3H]</b></p> <p><b>Muscle Structure and Function:</b> Mobility and Stability Functions of Muscles, Elements of Muscle Structure, Muscle Function.</p>   |
| <p><b>Module 3: [4H]</b></p> <p><b>Biomechanics of Vertebral Column:</b> General structure and Function (Region wise), Mobility and Stability of Vertebral Column, Muscles of the Vertebral Column, Biomechanics pelvic girdle</p>                          |
| <p><b>Module 4: [4H]</b></p> <p><b>Biomechanics of Shoulder Complex:</b> Components of shoulder complex, Integrated Function of Shoulder Complex, Mobility and Stability of Shoulder Complex</p>  |
| <p><b>Module 5: [4H]</b></p> <p><b>Biomechanics of Elbow Complex:</b> Structure and function of the Elbow Complex, Structure and Function of the superior and inferior Radio-ulnar Joints, Mobility and Stability of Elbow Complex</p>                      |
| <p><b>Module 6: [4H]</b></p> <p><b>Biomechanics of the Wrist and Hand Complex:</b> Structural components of the Wrist complex, function, structure and function of the Hand Complex, Finger Musculature, Functional Position of the Wrist and Hand</p>      |
| <p><b>Module 7: [4H]</b></p> <p><b>Biomechanics of the Knee Complex:</b> Structure and Function of the Tibiofemoral Joint, Static and Dynamic stability of Tibiofemoral Joint, Structure and Function of the Patellofemoral Joint, Stability of Patella</p> |



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**Module 8: [4H]**

**Biomechanics of the Ankle Complex:** Kinematics and Kinetics of the Tibiotalar Joint, Stability of the Ankle Joint, Arch of foot

**Learning Outcomes:** The student should be able to explain and demonstrate the movements occurring at the joints, the muscles involved, the movements or muscle action produced, and mention the axis and planes through which the movements occur. The demonstrations may be done on models or skeleton.

***Suggested Readings:***

**TEXT BOOKS:**

1. Joint Structure and Function: A Comprehensive Analysis, Pamela K. Levangie Cynthia C. Norkin
2. Basics Of Biomechanics, January 2010, Bahl Ajay
3. Brunnstrom, Clinical Kinesiology, JP Bros Medical Publishers, Bangalore, 5th Ed 1996, 1st Indian Ed 1998
4. Clinical Kinesiology for Physical Therapist Assistants, JP Bros Medical Publishers, Bangalore, 1st Indian Ed 1997

**REFERENCE BOOKS:**

1. Basics of Biomechanics, January 2010, Bahl Ajay
2. Joint structure & function, Cynthia norkins, FA Davis



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**Paper: PHARMACOLOGY**

**Code: BPTC303**

**Contacts Hours / Week: 4**

**Credits: 4**

**Course Contents**

|  |
|--|
| <b>Module 1: [7H]</b><br>General Pharmacology, drug allergy & idiosyncrasy, drug toxicity, different routes of administration.   |
| <b>Module 2: [8H]</b><br>Autonomic pharmacology.<br><br>Drugs acting on CNS/PNS Anesthetics, alcohols, alkaloids, narcotics, analgesics, antipyretics, sedatives, stimulants & psychotherapeutics. |
| <b>Module 3: [8H]</b><br>Drugs acting on C.V.S<br>Drugs acting on respiratory system.<br>Antibiotics & chemotherapeutic agents   |
| <b>Module 4: [8H]</b><br>Hormones and drugs affecting endocrine functions.<br>Drugs acting on G.I.System.  |
| <b>Module 5: [8H]</b><br>Immunomodulators  |
| <b>Module 6: [7H]</b><br>Vitamin D, Calcium, Iron, Blood related diseases  |
| <b>Module 7: [7H]</b><br>Heavy metals & antagonists.   |
| <b>Module 8: [7H]</b><br>Drugs acting on Muscles, Muscles relaxants.   |

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



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***Suggested Readings:***

**TEXT BOOKS:**

1. Pharmacology for Physiotherapist by KV Ramesh, jaypee Publishers.
2. Pharmacology For Physiotherapy Students 3rd Edition 2017 by Udaykumar Padmaja, Jaypee Brothers Medical Publishers.
3. Essentials of Medical Pharmacology Book by KD Tripathi.

**Paper: PSYCHOLOGY**

**Code: BPTC304**

**Contacts Hours / Week: 3+1**

**Credits: 4**

**Course Contents**

**Module 1: [20H]**

**General Psychology:**

**Definition of Psychology.**

Science of mind, consciousness and behavior, Scope and branches of Psychology, Methods of Introspection, observation and experimentation.

**Hereditary and Environment**

Relative importance of heredity and environment, Physical characteristics intelligence and personality

**Learning**

Types of learning

Trial and error, Classical Learning Instrumental learning, Insight for learning

**Memory**

Steps of memory, Measurement of memory, causes of forgetting (diff. types only), Concept Of STM & LTM

**Perceptual Process**

Nature of perceptual process, Structural and functional factors in perception, Illusion and Hallucination

**Emotion**

Emotion and feeling, Physiological changes, Theories of emotion (James-Lange and Eonnon-Bird)

**Motivation**

Motive need and Drive, Types of motive: Physiological, Psychological and Social



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**Intelligence**

Definitions: theory and assessment of I.Q.

**Personality:** Definition, Types and measurement.

**Module 2: [8H]**

**Child Psychology**

Concept of child Psychology - Meaning, nature, and subject matter of child Psychology, Practical importance of studying child Psychology for Physiotherapist or rehab team member Methods of studying child development, Baby Biography, Case History, Behavioral abnormalities.

**Module 3: [9H]**

**Industrial Psychology:**

1. Human Engineering, Importance of human engineering, Development in human engineering, problems in human engineering
2. Decision making process and steps indecision making, Individual decision making, decision making in organization
3. Stress and mental health, causes and reaction to stress, job stress and its management
4. Work culture, moral and reward of work discipline
5. Guidance and counseling- different types of counseling, meaning types and objectives of counselor.

**Module 4: [8H]**

**Rehabilitation Psychology:**

Purpose of studying, Interpersonal relationships, Familial & Social relationships, acceptance about the disability – its outcome in relation to different diagnostic categories psychological aspects of multiple handicapped, contribution of psychology in Total Rehab. Specific Rehabilitation Programme

**Tutorial: [15H]**

Same as Theory.

**Learning Outcomes:** Human Psychology involves the study of various behavioural patterns of individuals, theories of development, normal and abnormal aspects of motor, social, emotional and language development, communication and interaction skills appropriate to various age groups. The study of these subjects will help the student to understand their clients while assessment and while planning appropriate treatment methods.

**Suggested Readings:**

**TEXT BOOK: -**

1. Psychology for Physiotherapy by S K Mangal (Author)



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**Paper: INTRODUCTION TO QUALITY OF PATIENT SAFETY**

**Code: BPTG305**

**Contacts Hours / Week: 5+1**

**Credits: 6**

**Course Contents**

**Module 1: [12H]**

1. Quality assurance and management - The objective of the course is to help students understand the basic concepts of quality in health Care and develop skills to implement sustainable quality assurance program in the health system.

- a. Concepts of Quality of Care
- b. Quality Improvement Approaches
- c. Standards and Norms
- d. Quality Improvement Tools
- e. Introduction to NABH guidelines

**Module 2: [15H]**

Basics of emergency care and life support skills - Basic life support (BLS) is the foundation for saving lives following cardiac arrest. Fundamental aspects of BLS include immediate recognition of sudden cardiac arrest (SCA) and activation of the emergency response system, early cardiopulmonary resuscitation (CPR), and rapid defibrillation with an automated external defibrillator (AED). Initial recognition and response to heart attack and stroke are also considered part of BLS. The student is also expected to learn about basic emergency care including first aid and triage. Topics to be covered under the subject are as follows:

- a. Vital signs and primary assessment
- b. Basic emergency care – first aid and triage
- c. Ventilations including use of bag-valve-masks (BVMs)
- d. Choking, rescue breathing methods
- e. One- and Two-rescuer CPR
- f. Using an AED (Automated external defibrillator).
- g. Managing an emergency including moving a patient

**Module 3: [12H]**

Bio medical waste management and environment safety- The aim of this section will be to help prevent harm to workers, property, the environment and the general public. Topics to be covered under the subject are as follows:

- a. Definition of Biomedical Waste
- b. Waste minimization
- c. BMW – Segregation, collection, transportation, treatment and disposal (including color coding)
- d. Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste
- e. BMW Management & methods of disinfection
- f. Modern technology for handling BMW
- g. Use of Personal protective equipment (PPE)
- h. Monitoring & controlling of cross infection (Protective devices)



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**Module 4: [12H]**

Infection prevention and control - The objective of this section will be to provide a broad understanding of the core subject areas of infection prevention and control and to equip AHPs with the fundamental skills required to reduce the incidence of hospital acquired infections and improve health outcomes. Concepts taught should include –

- a. Evidence-based infection control principles and practices [such as sterilization, disinfection, effective hand hygiene and use of Personal protective equipment (PPE)],
- b. Prevention & control of common healthcare associated infections,
- c. Components of an effective infection control program, and
- d. Guidelines (NABH and JCI) for Hospital Infection Control

**Module 5: [12H]**

Antibiotic Resistance-

- a. History of Antibiotics
- b. How Resistance Happens and Spreads
- c. Types of resistance- Intrinsic, Acquired, Passive
- d. Trends in Drug Resistance
- e. Actions to Fight Resistance
- f. Bacterial persistence
- g. Antibiotic sensitivity
- h. Consequences of antibiotic resistance
- i. Antimicrobial Stewardship- Barriers and opportunities, Tools and models in hospitals

**Module 6: [12H]**

Disaster preparedness and management- The objective of this section will be to provide knowledge on the principles of on-site disaster management. Concepts to be taught should include-

- a. Fundamentals of emergency management,
- b. Psychological impact management,
- c. Resource management,
- d. Preparedness and risk reduction,
- e. Key response functions (including public health, logistics and governance, recovery, rehabilitation and reconstruction), information management, incident command and institutional mechanisms.

**Tutorial: [15H]**

Same as Theory.

**Learning Outcomes:** At the end of this topic, focus should be to teach the students to perform the maneuvers in simulation lab and to test their skills with focus on airways management and chest compressions. At the end of the foundation course, each student should be able to perform and execute/operate on the above-mentioned modalities.



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.....  
**Duration:** 4½ Years

**Total Credit:** 196

**Total Marks:** 5700  
.....

**Semester –IV**

| Course Code  | Course Name   | L - T - P | Credits   | Course Type            | Total Marks |
|--------------|---|-----------|-----------|------------------------|-------------|
| BPTC401      | Fundamental of Exercise therapy                     | 4-0-0     | 4         | Core Course            | 100         |
| BPTC491      | Fundamental of Exercise therapy Practical           | 0-0-4     | 2         | Core Course            | 100         |
| BPTC402      | Fundamental of Electro therapy                      | 4-0-0     | 4         | Core Course            | 100         |
| BPTC492      | Fundamental of Electro therapy Practical            | 0-0-4     | 2         | Core Course            | 100         |
| BPTC403      | Applied Biomechanics & Kinesiology                  | 3-1-0     | 4         | Core Course            | 100         |
| BPTC404      | Sociology   | 3-1-0     | 4         | Core Course            | 100         |
| BPTG405      | Introduction To Healthcare Delivery System in India | 5-1-0     | 6         | Generic Elective (GE4) | 100         |
| <b>TOTAL</b> |   |           | <b>26</b> |                        | <b>700</b>  |



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.....  
**Duration:** 4½ Years

**Total Credit:** 196

**Total Marks:** 5700  
.....

**Paper: FUNDAMENTALS OF EXERCISE THERAPY**

**Code: BPTC401**

**Contacts hours / week: 4**

**Credits: 4**

**Course Contents**

**Module 1: [7H]**

**Mechanics:** Force, Gravity, line of gravity, center of gravity in human body, Base, Equilibrium, Axes and Planes, mechanical principles of Lever, order of lever, examples in human body, Pendulum, Spring.

Descriptions of fundamental starting positions and derive position including joint positions, muscle work, stability, effects and uses.

Introduction to Movements including analysis of joint motion, muscle work and neuromuscular coordination. Principle, classification, techniques, physiological & therapeutic effects, indications & contraindications of therapeutic exercises.

Assessment & evaluation of a patient (region wise) to plan a therapeutic exercise program.

**Module 2: [4H]**

**Therapeutic Exercises**

1. Principle, classification, techniques, physiological & therapeutic effects, indications & contraindications of therapeutic exercises.

**Module 3: [7H]**

**Classification of movements:** Describe the types, technique of application, indications, Contraindications, effects and uses of the following:

a. Active Movement

b. Relaxed passive movements, basic knowledge of classification of relaxed passive movements, definition, technique, effects and uses of relaxed passive movements

c. Active assisted movement

d. Resisted exercises- Techniques and types of resistance, Oxford method, Delorm method, Mc queen method, Zinoviff Method, DAPRE Method, SAID Principle



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|---|
| <p><b>Module 4: [6H]</b><br/><b>Assisted Exercises:</b> Technique and uses<br/><b>Free exercises:</b> Classification, technique, Effects of frequent exercises on various systems</p>   |
| <p><b>Module 5: [6H]</b><br/><b>Posture:</b> Types, factors responsible for good posture, factors for poor posture, principles of development of good posture<br/>Bed Rest Complications</p>  |
| <p><b>Module 6 [9H]</b><br/><b>Manual Muscle Testing</b><br/>a) Principles and application techniques of Manual muscle testing.<br/>b) Testing position, procedure and grading of muscles of the upper limb, lower limb and trunk etc.</p>  |
| <p><b>Module 7: [7H]</b><br/><b>Goniometry:</b><br/><b>Goniometers and its types</b><br/>a) Principles, techniques and application of Goniometry.<br/>b) Testing position, procedure and measurement of R.O.M. of the joints of upper limbs, lower limbs and trunk<br/>c) Causes of restriction of joint movement, prevention of restriction of joint range of motion etc</p>   |
| <p><b>Module 8: [7H]</b><br/><b>Soft Tissue Manipulation (Therapeutic Massage)</b><br/>a) History, various types of soft tissue manipulation techniques.<br/>b) Physiological effects of soft tissue manipulation on the following systems of the body; Circulatory, Nervous, Musculoskeletal, Excretory, Respiratory, Integumentary system and Metabolism.<br/>c) Classify, define and describe: - effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc.<br/>d) Preparation of patient: Therapeutic Effects, uses, indications and contraindications of the above manipulation</p> |
| <p><b>Module 9: [7H]</b><br/><b>Relaxation &amp; Therapeutic Gymnasium</b><br/><b>Relaxation</b><br/>1. Describe relaxation, muscle fatigue, muscle spasm and tension (mental &amp; physical).<br/>2. Factors contributing to fatigue &amp; tension.<br/>3. Techniques of relaxation (local and general)<br/>4. Effects, uses &amp; clinical application.<br/>5. Indication &amp; contraindication.<br/><b>Therapeutic Gymnasium</b><br/>i) Setup of a gymnasium &amp; its importance<br/>ii) Various equipments in the gymnasium<br/>iii) Operational skills, effects &amp; uses of each equipment</p>             |



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**Paper: FUNDAMENTALS OF EXERCISE THERAPY PRACTICAL**

**Code: BPTC491**

**Contacts Hours / Week: 4**

**Credits: 2**

**Course Contents**

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| <b>Module 1: [4H]</b><br>To practice the entire soft tissue manipulative techniques region wise – upper limb, lower limb, neck, back and face. |
| <b>Module 2: [4H]</b><br>To practice the measurement of ROM of joints – upper limb, lower limb & trunk.  |
| <b>Module 3: [4H]</b><br>To practice the grading of muscle strength region wise – upper limb, lower limb and trunk.                            |
| <b>Module 4: [4H]</b><br>To study the position of joints, muscle work, and stability of various fundamental and derived positions.             |
| <b>Module 5: [4H]</b><br>To study the different types of muscle contraction, muscle work, group action of muscles and coordinated movements.   |
| <b>Module 6: [4H]</b><br>To practice the various types of suspension therapy and its application on various parts of body – region wise.       |
| <b>Module 7: [3H]</b><br>To study & practice local & general relaxation techniques.  |
| <b>Module 8: [3H]</b><br>To study the structure & function along with application of various equipment in a Gymnasium.                         |

**Learning Outcomes:** In this course, the students will learn the principles and effects of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions. After the course on exercise therapy student will be able to understand the different types of exercise for the benefit of patient in different situations and conditions both in health and disease or disorder.

***Suggested Readings:***

**TEXT BOOKS: -**

1. Therapeutic exercise by Carolyn Kisner
2. Principles of exercise therapy by M.Dena Gardiner
3. Practical Exercise therapy by Hollis Margaret



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**Paper: FUNDAMENTALS OF ELECTRO THERAPY**

**Code: BPTC402**

**Contacts Hours / Week: 4**

**Credits: 4**

**Course Contents**

|   |
|---|
| <p><b>Module 1: [5H]</b><br/><b>Electrical Fundamentals</b>-Physical Principles-Structure and properties of matter" molecular atom, proton, neutron, electron, ion, etc. Electrical Energy: Nature of electricity-Current Static Electricity Current - Electric potentials generated by cell-Ohm's Law, Joule's Law.</p>  |
| <p><b>Module 2: [5H]</b><br/><b>Magnetic Energy:</b> Nature and property of a magnet, magnetic induction snow rule, Mexwel corkscrew rule, Electromagnetic induction, Principle of working of choke coil-transformer-rectification of A.C to D.C. Metal Oxide Rectifier, Semi-Conductor-Diode and Triode.</p>   |
| <p><b>Module 3: [5H]</b><br/><b>Valves</b>-Principles, working-condenser-principle-Details of charging and discharging, etc. Transistors, measurement of current intensity, EMS and power-moving coil millimeter and voltmeter.</p>   |
| <p><b>Module 4: [5H]</b><br/>Electrical supply:<br/>a) Brief outline of main supply of electric current.<br/>b) Dangers – short circuits, electric shocks.<br/>c) Precautions – safety devices, earthling, fuses etc.<br/>d) First aid &amp; initial management of electric shock.</p>  |
| <p><b>Module 5: [5H]</b><br/>Low Frequency Currents:<br/>a. Introduction to direct, alternating &amp; modified currents.<br/>b. Production of direct current – Physiological and therapeutic effects of constant current, anodal and cathodal Galvanism, Ionization and their application in various conditions.<br/>c. Iontophoresis – Principles of clinical application, indication, contraindication, precaution, operational skills of equipment &amp; patient preparation.<br/>d. Modified direct current – various pulses, duration and frequency and their effect on Nerve and Muscle tissue. Production of interrupted and surged current &amp; their effects.<br/>e. Modified direct current – Physiological and therapeutic effects, principles of clinical application, indications, contra indications, precautions, operational skills of equipment &amp; patient preparation.<br/>f. High Voltage Pulsed Galvanic Stimulation, Diadynamic Currents</p> |



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**Module 6: [5H]**

Transcutaneous Electrical Nerve Stimulations (TENS):

- a) Types of Low Frequency, pulse widths, frequencies & intensities used as TENS applications.
- b) Theories of pain relief by TENS.
- c) Principle of clinical application effects & uses, indications, contraindications, precautions, operational skills of equipment & patient preparation.

**Module 7: [5H]**

**Electrogenic membranes response**-chemo responsive electrogenic systems. Neuromuscular junction-synapse-muscle electrogenic electro physiology of C.N.S.

**Module 8: [5H]**

**Electrical Reactions and Electro – diagnostic tests:**

- Electrical Stimuli and normal behavior of Nerve and muscle tissue.
- Types of lesion and development of reaction of degeneration.
- Faradic – Intermittent direct current test.
- S.D. Curve and its application.
- Chronaxie, Rheobase, F.G.Test etc

**Module 9: [5H]**

**Infra-red rays** – Wavelength, frequency, types & sources of IRR generation, techniques of irradiation, physiological & therapeutic effects, indications, contraindications, precautions, operational skills of equipment & patient preparation.

**Module 10: [5H]**

Ultraviolet rays (UVR):

- a) Wavelength, frequency, types & sources of UVR generation, techniques of irradiation, physiological & therapeutic effects, indications, contraindications, precautions, operational skills of equipment & patient preparation.
- b) Dosimetry of UVR.

**Module 11: [5H]**

**Superficial heat** - Paraffin wax bath, moist heat, electrical heating pads, Contrast bath, Whirl pool bath, Fluido therapy

- a) Mechanism of production.
- b) Mode of heat transfer.
- c) Physiological & therapeutic effects.
- d) Indications, contraindications, precautions, operational skills of equipment & patient preparation.

**Module 12: [5H]**

**Cryotherapy:** Principles, Physiological effects, uses of Cold packs, Ice massage, Commercial Cold Packs, Ice Towels, Cold compression Units, Evaporating Sprays.



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**Paper: FUNDAMENTAL OF ELECTRO THERAPY PRACTICAL**

**Code: BPTC492**

**Contacts Hours / Week: 4**

**Credits: 2**

**Course Contents**

|   |
|---|
| <p><b>Module 1: [2H]</b></p> <p>To study the basic operation of electric supply to the equipment &amp; safety devices.</p>                                  |
| <p><b>Module 2: [2H]</b></p> <p>To experience sensory and motor stimulation of nerves and muscles by various types of low frequency currents on self.</p>   |
| <p><b>Module 3: [2H]</b></p> <p>To locate and stimulate different motor points region wise, including the upper &amp; lower limb, trunkx</p>                |
| <p><b>Module 4: [2H]</b></p> <p>Therapeutic application of different low frequency currents Faradic foot bath, Faradism under pressure, Ionotophoresis.</p> |
| <p><b>Module 5: [3H]</b></p> <p>To study the reactions of degeneration of nerves, to plot strength duration curves.</p>                                     |
| <p><b>Module 6: [2H]</b></p> <p>To find chronaxie and Rheobase.</p>   |
| <p><b>Module 7: [2H]</b></p> <p>To study a hydrocollator unit, its operations and therapeutic application of Hot packs –region wise.</p>                    |
| <p><b>Module 8: [3H]</b></p> <p>To study the various types of Infrared lamps and their application to body region wise.</p>                                 |



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| <p><b>Module 9: [3H]</b></p> <p>To study a paraffin wax bath unit, its operation and different methods of application – region wise.</p>                                   |
| <p><b>Module 10: [3H]</b></p> <p>To study the different types of Ultra violet units, their operation, assessment of test dose and application of U.V.R. – region wise.</p> |
| <p><b>Module 11: [3H]</b></p> <p>To study a TENS Stimulator, its operation and application – region wise.</p>  |
| <p><b>Module 12: [3H]</b></p> <p>To study various forms of therapeutic cold application region wise including – ice, cold packs, vapocoolant sprays, etc.</p>              |

**Learning Outcomes:** In this course the student will learn the Principles, Techniques, Effects, Indication, Contra-Indication and the dosage parameter for various indications of electro therapeutic modalities in the restoration of physical function. The student will be able to list the indications, contra indications, dosages of electro therapy modalities, demonstrates the different techniques, and describe their effects on various conditions.

***Suggested Readings:***

**TEXT BOOKS: -**

1. Claytons Electrotherapy by Forster & Plastangs
2. Electrotherapy Explained by Low & Reed
3. Electrotherapy Evidence based practice by Sheila Kitchen



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**Paper: APPLIED BIOMECHANICS & KINESIOLOGY**

**Code: BPTC403**

**Contacts Hours / Week: 3+1**

**Credits: 4**

**Course Contents**

|  |
|--|
| <b>Module 1: [5H]</b><br><b>Applied Biomechanics of Vertebral Column:</b> General effects of Aging and Injury  |
| <b>Module 2: [5H]</b><br><b>Applied Biomechanics of Shoulder Complex:</b> Structural and Functional Dysfunctions around Shoulder Complex   |
| <b>Module 3: [5H]</b><br><b>Applied Biomechanics of Elbow Complex:</b> Effect of Immobilization and Injury   |
| <b>Module 4: [6H]</b><br><b>Biomechanics of the Hip Complex:</b> Biomechanical alteration in various Hip joint Pathology   |
| <b>Module 5: [5H]</b><br><b>Biomechanics of the Knee Complex:</b> Biomechanics changes in the Knee complex with Pathology  |
| <b>Module 6: [5H]</b><br><b>Biomechanics of the Ankle Complex:</b> Effect of weight bearing on foot  |
| <b>Module 7: [7H]</b><br><b>Biomechanics of Gait:</b> Kinematics of Gait, Phases, Spatiotemporal Parameters of Gait, Determinants of Gait, Energy requirements, Kinetics of Gait, External and Internal Forces, Kinetics and Kinematics of the Trunk and Upper Extremities, Stair climbing gait, Effect of age, Gender, Assistive Devices, Disease States, Muscle pathology, Malalignments, Injuries and limb length discrepancies on Human Gait |
| <b>Module 8: [7H]</b><br><b>Posture:</b> Static and Dynamic Posture, Major Goals and basic elements of Postural control, Kinetics and Kinematics of Posture, Inertial and Gravitational Forces, Ground Reaction Forces, Optimal or Ideal Posture, Biomechanics analysis of Posture in all planes, Effect of Age, Pregnancy, and Pathology on Posture   |



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**Tutorial: [15H]**

Same as Theory.

**Learning Outcomes:** The student shall be taught and demonstrated to analysis for activities of daily living – ADL – (like sitting to standing, throwing, lifting etc.) The student should be able to explain and demonstrate the movements occurring at the joints, the muscles involved, the movements or muscle action produced, and mention the axis and planes through which the movements occur. The demonstrations may be done on models or skeleton.

***Suggested Readings:***

**TEXT BOOKS: -**

1. Joint Structure and Function: A Comprehensive Analysis, Pamela K. Levangie Cynthia C. Norkin
2. Basics Of Biomechanics, January 2010, Bahl Ajay
3. Brunnstrom, Clinical Kinesiology, JP Bros Medical Publishers, Bangalore, 5th Ed 1996, 1st Indian Ed 1998
4. Clinical Kinesiology for Physical Therapist Assistants, JP Bros Medical Publishers, Bangalore, 1st Indian Ed 1997

**REFERENCE BOOKS: -**

1. Basics Of Biomechanics, January 2010, Bahl Ajay
2. Joint structure & function, Cynthia norkins, FA Davis



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**Paper: SOCIOLOGY**

**Code: BPTC404**

**Contacts Hours / Week: 3+1**

**Credits: 4**

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|--|
| <p><b>Module 1: [7H]</b><br/>Introduction<br/>Definition of Sociology, Sociology as a science, uses of the study of Sociology, application of knowledge of sociology in Physiotherapy</p>  |
| <p><b>Module 2: [6H]</b><br/>Sociology and Health<br/>Social factors affecting health status</p>   |
| <p><b>Module 3: [7H]</b><br/>Socialization:<br/>a. Meaning and nature of socialization.<br/>b. Primary, Secondary and Anticipatory socialization.<br/>c. Agencies of socialization.</p>  |
| <p><b>Module 4: [6H]</b><br/>Social Groups:<br/>Concepts of social groups: formal and informal group (Definition only), primary groups and secondary groups (Definition only)</p>  |
| <p><b>Module 5: [7H]</b><br/>Family:<br/>a. The family, meaning and definitions.<br/>b. Functions of types of family<br/>c. Changing family patterns<br/>d. Influence of family on the individual's health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy.</p> |
| <p><b>Module 6: [7H]</b><br/>Community:<br/>a. Rural community: Meaning and features –Health hazards of ruralities, health hazards to tribal community.<br/>b. Urban community: Meaning and features- Health hazards of urbanities.</p>  |



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**Module 7: [7H]**

Culture and Health:

- a. Concept of Health
- b. Concept of Culture
- c. Culture and Health
- d. Culture and Health Disorders

**Module 8: [7H]**

Social change:

- a. Meaning of social changes.
- b. Factors of social changes.
- c. Human adaptation and social change
- d. Social change and stress.
- e. Social change and deviance.
- f. Social change and health programme

**Module 9: [7H]**

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

- a. Population explosion
- b. Poverty and unemployment
- c. Beggary
- d. Juvenile delinquency
- e. Prostitution
- f. Alcoholism
- g. Problems of women in employment
- h. Geriatric problems
- i. Problems of underprivileged.

**Module 10: [7H]**

Social Security:

- a. Social security and social legislation in relation to the disabled.

**Module 11: [7H]**

Social worker:

- a. Meaning of Social Work
- b. The role of a Medical Social Worker.



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**Tutorial: [15H]**

Same as Theory.

**Learning Outcomes:** Sociology will introduce student to the basic sociology concepts, principles and social process, social institutions in relation to the individual, family and community and the various social factors affecting the family in rural and urban communities in India will be studied.

***Suggested Readings:***

**TEXT BOOK: -**

1. K.P. NEERAJA, Textbook of Sociology for Physiotherapy Students, Jaypee.



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**Paper: INTRODUCTION TO HEALTHCARE DELIVERY SYSTEM IN INDIA**

**Code: BPTG405**

**Contacts Hours / Week: 3+1**

**Credits: 4**

**Module 1: [10H]**

Introduction to healthcare delivery system

- a. Healthcare delivery system in India at primary, secondary and tertiary care
- b. Community participation in healthcare delivery system
- c. Health system in developed countries.
- d. Private Sector
- e. National Health Mission
- f. National Health Policy
- g. Issues in Health Care Delivery System in India

**Module 2: [10H]**

National Health Programme- Background objectives, action plan, targets, operations, achievements and constraints in various National Health Programme.

**Module 3: [10H]**

Introduction to AYUSH system of medicine

- a. Introduction to Ayurveda.
- b. Yoga and Naturopathy
- c. Unani
- d. Siddha
- e. Homeopathy
- f. Need for integration of various system of medicine

**Module 4: [10H]**

Health scenario of India- past, present and future

**Module 5: [10H]**

Basic medical terms and record keeping

Form medical terms by utilizing roots, suffixes, prefixes and combining roots, interpret basic medical abbreviations/symbols, utilize diagnostic, surgical, and procedural terms and abbreviations related to the integumentary system, musculoskeletal system, respiratory system, cardiovascular system, nervous system, and endocrine system

Interpret medical orders/reports. Data entry and management on electronic health record system



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**Module 6: [10H]**

Epidemiology

- a. Principles of Epidemiology
- b. Natural History of disease
- c. Methods of Epidemiological studies
- d. Epidemiology of communicable & non-communicable diseases, disease transmission, host defense immunizing agents, cold chain, immunization, disease monitoring and surveillance.

**Learning Outcomes:** The course provides the students a basic insight into the main features of Indian health care delivery system and how it compares with the other systems of the world.

***Suggested Readings:***

**TEXT BOOK: -**

1. Introduction To Health Care And Careers by DeLaet, Lippincott



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.....  
**Duration:** 4½ Years

**Total Credit:** 196

**Total Marks:** 5700  
.....

**Semester –V**

| Course Code  | Course Name  | L - T - P | Credits   | Course Type | Total Marks |
|--------------|--|-----------|-----------|-------------|-------------|
| BPTC501      | Applied Exercise therapy   | 4-0-0     | 4         | Core Course | 100         |
| BPTC591      | Applied Exercise therapy<br>Practical                                | 0-0-4     | 2         | Core Course | 100         |
| BPTC502      | Applied Electro therapy  | 4-0-0     | 4         | Core Course | 100         |
| BPTC592      | Applied Electro therapy<br>Practical                                 | 0-0-4     | 2         | Core Course | 100         |
| BPTC503      | Physical/ Functional<br>Assessment & Applied<br>Radiological Imaging | 4-0-0     | 4         | Core Course | 100         |
| BPTC593      | Physical/ Functional<br>Assessment Practical                         | 0-0-4     | 2         | Core Course | 100         |
| BPTS581      | Clinical Observation   | 0-0-4     | 2         | SEC1        | 100         |
| <b>TOTAL</b> |  |           | <b>20</b> |             | <b>700</b>  |



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.....  
**Duration:** 4½ Years

**Total Credit:** 196

**Total Marks:** 5700  
.....

**DETAILED SYLLABUS**

**Semester V**

**Paper: APPLIED EXERCISE THERAPY**

**Code: BPTC501**

**Contacts Hours / Week: 4**

**Credits: 4**

**Module 1: [3H]**

Specific exercise regimens

Isotonic: De Lormes, Oxford, MacQueen, Circuit weight training

Isometric: BRIME (Brief Resisted Isometric Exercise), Multiple Angle Isometrics Isokinetic regimens

**Module 2: [7H]**

Proprioceptive Neuromuscular Facilitation

Definitions & goals

Basic neurophysiologic principles of PNF: Muscular activity, Diagonals patterns of movement: upper limb, lower limb

Procedure: components of PNF Techniques of facilitation

Mobility: Contract relax, Hold relax, Rhythmic initiation

Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization Stability:

Alternating isometric, rhythmic stabilization

Skill: timing for emphasis, resisted progression Endurance: slow reversals, agonist reversal

**Module 3: [5H]**

Suspension Therapy

Definition, principles, equipments & accessories, Indications & contraindications, Benefits of suspension therapy

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

**Module 4: [5H]**

Joint Mobility – Etiogenesis of Joint stiffness, general techniques of mobilization, effects, indications, contraindications & precautions.

Muscle Insufficiency – Etiogenesis of muscle insufficiency (strength, tone, power, endurance & volume), general techniques of strengthening, effects, indication, contraindications & precautions.



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**Module 5: [5H]**

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.

**Module 6: [5H]**

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.

**Module 7: [3H]**

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.

**Module 8: [5H]**

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.

**Module 9: [8H]**

Balance, Gait

Static and Dynamic Balance – Assessment & management including therapeutic exercises.

Gait – Overview of normal gait & its components.

Gait deviations - Assessment, Types, etiogenesis, management, including therapeutic exercises.

Types of walking aids, indications, effects & various training techniques

**Module 10: [4H]**

Neuromuscular Inco-ordination- Review normal neuromuscular coordination, Etiogenesis of neuromuscular in co-ordination & general therapeutic techniques, effects, indications, contraindications & precautions.



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**Module 11: [5H]**

Hydrotherapy:

Basic principles of fluid mechanics, as they relate to hydrotherapy.

Physiological & therapeutic effects of hydrotherapy, including joint mobility muscle

Strengthening & wound care etc.

Types of Hydrotherapy equipment, indications, contraindications, operation skills & patient preparation.

**Module 12: [5H]**

Special Techniques:

Principles of traction, physiological & therapeutic effects classification, types, indications, contraindications, techniques of application, operational skills & precautions.

Review normal breathing mechanism, types, techniques, indications, contraindications, therapeutic effects & precautions of breathing exercises.

Group Therapy – Types, advantages & disadvantages.

**Paper: APPLIED EXERCISE THERAPY PRACTICAL**

**Code: BPTC591**

**Contacts Hours / Week: 4**

**Credits: 2**

**Module 1: [3H]**

To study & practice the various techniques of mobilization of joints region wise.

**Module 2: [3H]**

To study & practice the various techniques of progressive strengthening exercises of muscles region wise.

**Module 3: [3H]**

To practice assessment & evaluative procedures, including motor, sensory, Neuromotor coordination, vital capacity, limb length & higher functions.

**Module 4: [3H]**

To study & practice the use of various ambulation aids in gait training.

**Module 5: [3H]**

To assess & evaluate ADL's and practice various training techniques.

**Module 6: [3H]**

To study & practice Mat Exercises.

**Module 7: [3H]**

To assess & evaluate equilibrium / balance & practice various techniques to improve balance.

**Module 8: [3H]**

To study the structure & functions of hydrotherapy equipments & their applications.

**Module 9: [3H]**

To study & practice various traction techniques, including manual, mechanical & electrical procedures.



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**Module 10: [3H]**

To study & practice various group exercise therapies.

**Learning Outcomes:** After the course on exercise therapy student will be able to understand the different types of exercise for the benefit of patient in different situations and conditions both in health and disease or disorder.

**Suggested Readings:**

**TEXT BOOKS: -**

1. Gardiner, Dena M. Principles of Exercise Therapy CBS, New Delhi 1999
2. Kisner, C. and Kolby, L.A. Therapeutic Exercise Foundation and Technique Jaypee, New Delhi 1996
3. Holey, E. and Cook, E. Therapeutic Massage Harcourt, Singapore 1998
4. Hollis, M. and Cook, P.F. Practical Exercise Therapy Blackwell, Oxford 1999
5. Campion, M. R. Hydrotherapy: principles and Practice Butterworth, Oxford 2000
6. Adler, S.S. PNF in Practice Springer, New York 2003

**Paper: APPLIED ELECTRO THERAPY**

**Code: BPTC502**

**Contacts Hours / Week: 4**

**Credits: 4**

**Module 1: [10H]**

1. Review of Neuro muscular Physiology including effects of electrical stimulation.
2. Physiological responses to heat gain or loss on various tissues of the body.
3. Therapeutic effects of heat, cold and electrical currents.
4. Physical principles of Electro – magnetic radiation.
5. Physics of sound including characteristics and propagation.

**Module 2: [25H]**

1. High frequency currents (Short Wave Diathermy and Micro Wave Diathermy) - Production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.
2. Medium frequency currents (Interferential Therapy and Russian Current) - Conceptual framework of medium frequency current therapy, production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.
3. High frequency sound waves (Ultrasound) - Production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.



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**Module 3: [15H]**

1. Therapeutic light in Physiotherapy (LASER) – Definition, historical background, physical principles, biophysical effects, types, production, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.
2. Therapeutic mechanical pressure (Intermittent compression therapy) – Principle, biophysical effects, types, therapeutic effects, indications, contraindications, precautions, operational skills and patient preparation.
3. Extracorporeal Shock Wave Therapy: Principles, Effects and Uses, Indications, Contraindications, Precautions and preparation of the patient

**Module 4: [10H]**

1. Electro – diagnosis – Instrumentation, definition & basic techniques of E.M.G. and Nerve Conduction Velocity Studies
2. Bio–feedback – Instrumentation, principles, therapeutic effects, indications, contraindications, limitations, precautions, operational skills and patient preparation.

**Paper: APPLIED ELECTRO THERAPY PRACTICAL**

**Code: BPTC592**

**Contacts Hours / Week: 4**

**Credits: 2**

**Module 1: [6H]**

To study a Short-Wave Diathermy unit, its operation and different methods of application – region wise.

**Module 2: [6H]**

To study a Micro Wave Diathermy unit, its operation unit, its operation and different methods of application – region wise.

**Module 3: [6H]**

To study an Ultrasound unit, its operation and different methods of application – region wise.

**Module 4: [6H]**

To study a Laser unit, its operation and different methods of application – region wise.

**Module 5: [6H]**

To study an Interferential therapy unit, its operation and different methods of application – region wise.

**Learning Outcomes:** In this course the student will learn the Principles, Techniques, Effects, Indication, Contra-Indication and the dosage parameter for various indications of electro therapeutic modalities in the restoration of physical function. The objective of this course is that after 240hrs of lectures, demonstration, practical and clinics the student will be able to list the indications, contra indications, dosages of electro therapy modalities, demonstrates the different techniques, and describe their effects on various conditions.



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**Suggested Readings:**

**TEXT BOOKS: -**

1. Froster, A. and Palastanga, N. Clayton's Electrotherapy: Theory and Practice AITBS, Delhi 1999
2. John, Low and Ann, Reed Electrotherapy Explained: Principles Butterworth Heine, Oxford 2000
3. Nelson, R.M. and Currier, D.P. Clinical Electrotherapy Appleton and Lange 1987
4. Cameron, M.H. Physical Agents in Rehabilitation W B Saunders, London 1999
5. Sheila Kitchen. Electrotherapy- Evidence Based Practice

**Paper: PHYSICAL/ FUNCTIONAL ASSESSMENT & APPLIED RADIOLOGICAL IMAGING**

**Code: BPTC503**

**Contacts Hours / Week: 4**

**Credits: 4**

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|---|
| <b>Module 1: [6H]</b><br>Problem oriented Medical Record-History, Concept & Advantages communication with patient-principle and methods and types   |
| <b>Module 2: [17H]</b><br>Physical approach on the basis of functional Assessment<br>(a) Musculo-skeletal system<br>1. Maitland's Concept<br>2. Cyriax Approach<br>3. McKenzie Concept<br>4. Neural Tension Test - normal & abnormal findings |
| <b>Module 3: [10H]</b><br>(b) Neuro-Muscular System (for Central Nervous System Problems)<br>1. Bobath approach<br>2. Motor Relearning Process  |
| <b>Module 4: [4H]</b><br>Diagnostic imaging (Regional X-Ray, CT, MRI) and clinical decision making  |
| <b>Module 5: [5H]</b><br>Rationale of plan of Physiotherapeutic Management  |
| <b>Module 6: [18H]</b><br>Special orthopaedic tests commonly used in the clinical setting   |



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**Paper: PHYSICAL/ FUNCTIONAL ASSESSMENT & APPLIED RADIOLOGICAL IMAGING PRACTICAL**

**Code: BPTC593**

**Contacts Hours / Week: 4**

**Credits: 2**

**Module 1: [10H]**

Practical Orientation on the basis of functional Assessment

(a) Musculo-skeletal system

1. Maitland's Concept
2. Cyriax Approach
3. McKenzie Concept
4. Neural Tension Test - normal & abnormal findings

**Module 2: [8H]**

(b) Practical Orientation on the Neuro-Muscular System (for Central Nervous System Problems)

1. Bobath approach
2. Motor Relearning Process

**Module 3: [12H]**

Practical demonstration of the Special orthopaedic tests commonly used in the clinical setting

**Learning Outcomes:** On completion of this section, students shall develop an in-depth understanding and comprehensive knowledge of the different specialized approaches used in physiotherapeutic management. Students are expected to develop practical skills on the execution of the same. Focus is placed on manual therapy techniques and different school of thoughts. This section prepares students to deal with and treat patients in a purely clinical setting.

**Suggested Readings:**

**TEXT BOOKS: -**

1. Magee, David J. Orthopedic and Physical Assessment Saunders, Philadelphia 2002
2. Carr, J.H. and Shepherd, R.B. Stroke Rehabilitation Butterworth Heinemann, Singapore 2003
3. Bobath, Berta Adult Hemiplegia: Evaluation and treatment Butterworth, Oxford 1990
4. Hislop, H.J. and Montgomery, J. Daniels and Worthingham's Muscle Testing: Techniques of Manual Examination W.B. Saunders, Philadelphia 2002
5. Susan B. O'Sullivan, Thomas J. Schmitz, George D. Fulk. Physical Rehabilitation, 7<sup>th</sup> Ed, FA DAVIS.



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| Course Code | Course Name          | L - T - P | Credits | Course Type | Total Marks |
|-------------|----------------------|-----------|---------|-------------|-------------|
| BPTS581     | Clinical Observation | 0-0-4     | 2       | SEC1        | 100         |

**Paper: CLINICAL OBSERVATION**

**Code: BPTC581**

**Contacts Hours / Week: 4**

**Credits: 2**

**Module 1: [30H]**

Physiotherapy OPD

**Learning Outcomes:** The students will be clinically trained to provide physiotherapy care for the patients under supervision. They will be trained on bed side approach, patient assessment, performing special tests, identifying indications for treatment, ruling out contraindications, decision on treatment parameters, dosage and use relevant outcome measures under supervision



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.....  
**Duration:** 4½ Years

**Total Credit:** 196

**Total Marks:** 5700  
.....

**Semester -VI**

| Course Code  | Course Name  | L - T - P | Credits   | Course Type | Total Marks |
|--------------|--|-----------|-----------|-------------|-------------|
| BPTC601      | Orthopedics &Traumatology  | 4-0-0     | 4         | Core Course | 100         |
| BPTC691      | Orthopedics &Traumatology<br>Practical   | 0-0-4     | 2         | Core Course | 100         |
| BPTC602      | General Surgery Including<br>Cardio Thoracic Surgery,<br>Plastic Surgery, Obstetrics<br>and Gynecology           | 4-0-0     | 4         | Core Course | 100         |
| BPTC692      | General Surgery Including<br>Cardio Thoracic Surgery,<br>Plastic Surgery, Obstetrics<br>and Gynecology Practical | 0-0-4     | 2         | Core Course | 100         |
| BPTC603      | General Medicine and Cardio<br>thoracic condition and<br>Pediatrics  | 4-0-0     | 4         | Core Course | 100         |
| BPTC693      | General Medicine and Cardio<br>thoracic condition and<br>Pediatrics- Practical                                   | 0-0-4     | 2         | Core Course | 100         |
| <b>TOTAL</b> |  |           | <b>18</b> |             | <b>600</b>  |



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.....  
**Duration:** 4½ Years

**Total Credit:** 196

**Total Marks:** 5700  
.....

**DETAILED SYLLABUS**

**Semester VI**

**Paper: ORTHOPEDICS & TRAUMATOLOGY**

**Code: BPTC601**

**Contacts Hours / Week: 4**

**Credits: 4**

**Module 1: [6H]**

**Introduction to Orthopedics**

Introduction to orthopaedic terminology. Types of pathology commonly dealt with, clinical examination, common investigations X- rays & imaging techniques and outline of non – operative management.

**Principles of operative treatment**

List indications, contraindication and briefly outline principles of: Athrodesis, Arthroplasty, Osteotomy, Bone grafting, Tendon – Transfers and Arthroscopy

**Sprains and Muscle Strains**

List common sites of sprains and muscle strains and describe the clinical manifestations and treatment. viz. Tennis Elbow, Golfer’s Elbow, Dequervain’s disease, Tenovaginitis, Trigger finger, Carpal Tunnel Syndrome and Plantar Fasciitis etc.

**Module 2: [6H]**

**Sports Injuries:** Injuries related to common sports their classification and management.

**Fractures and Dislocations:** General Principles, outline the following:

- i) Types of Fractures including patterns. Open and closed fractures and fracture – dislocations
- ii) Differences between dislocation & subluxation.
- iii) General & Local signs & symptoms of fractures & dislocation.
- iv) Principle of management of fractures & dislocations.
- v) Prevention & treatment of complications including: Fracture – disease, Volkmann’s Ischemic Contracture, Sudeck’s Atrophy, Carpal Tunnel Syndrome. Myositis Ossificans and Shoulder-Hand syndrome
- vi) Fracture healing.

**Module 3: [7H]**

**Upper Limb and Lower Limb Fractures & Dislocations**

- a) Enumerate major long bone fractures and joint injuries.
- b) Briefly describe their clinical features, principles of management and complications.



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**Spinal Fractures and Dislocations:** Outline the mechanism, clinical features, principles of management and complications of spinal injuries.

**Recurrent Dislocations:** Outline the mechanism, clinical features, principles of management and complications of recurrent dislocation of the shoulder and patella.

**Module 4: [6H]**

Amputations

- a) Classify amputations. List indication for surgery,
- b) Outline pre-operative, operative and prosthetic management.
- c) Outline prevention and treatment of complications.

**Module 5: [7H]**

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

**Bone Joint Tumors:** Classify and outline the clinical features, management and complications of the following (benign / malignant bone and joint tumors, Osteomas, Osteosarcomas, Osteoclastomas, Ewing's sarcoma, Multiplemyeloma)

**Module 6: [7H]**

**Chronic Arthritis:** Outline of pathology: clinical features, mechanism of deformities, management and complications of: Rheumatoid arthritis. Osteoarthritis of major joints and spine, Ankylosing spondylitis.

Neck & Back Pain, Painful Arc Syndrome, Tendinitis, Fascitis & Spasmodic Torticollis, (Outline the above including clinical features and management)

**Module 7: [7H]**

**Spinal and Other Deformities:** Classify spinal deformities and outline the salient clinical features, management and complications of Scoliosis, Kyphosis and Lordosis, Cervical Rib, Common acquired deformities of foot, knee, hip, shoulder, elbow and wrist including hand

**Poliomyelitis:** Describe the pathology, microbiology, prevention, management and complications of polio.

Outline the treatment of residual paralysis including use of orthosis, Principles of muscle transfers and corrective surgery

**Module 8: [7H]**

**Congenital Deformities:** Outline the clinical features and management of Congenital Talipes Equino Varus (CTEV), Congenital Dislocation of the Hip, Flat foot, vertical talus, limb deficiency (radial club hand and femoral, tibial and fibula deficiencies) meningomyelocele, Arthrogryphosis multiplex congenita and Osteogenesis imperfecta

18. **Peripheral Nerve Injuries:** Outline the clinical features and management, including reconstructive surgery of:

- a) Radial, median and ulnar nerve lesions.
- b) Sciatic and lateral popliteal lesions.
- c) Brachial Plexus injuries including Erbs, Klumpke's and crutch palsy, Claw Hand



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**Module 9: [7H]**

Hand Injuries: Outline of clinical features, management and complications of: Skin and soft tissue injury, tendon injury, bone and joint injury.

Leprosy: Outline of clinical features, management and complications of neuritis, muscle paralysis, tropic ulceration and hand & feet deformities.

**Paper: ORTHOPEDICS & TRAUMATOLOGY PRACTICAL**

**Code: BPTC691**

**Contacts Hours / Week: 4**

**Credits: 2**

Same as Theory. [30H]

**Learning Outcomes:** This subject follows the basic science subjects to provide the knowledge about Orthopedic conditions the therapist would encounter in their practice. The objective of this course is that after completion of the lectures and discussion the student will be able to demonstrate an understanding of orthopedic conditions causing disability, list the etiology, clinical features and methods of investigations and management.

***Suggested Readings:***

**TEXT BOOKS: -**

1. Joshi, J. and Kotwal, P. Essential of Orthopedics and Applied Physiotherapy Elsevier, New Delhi 2004
2. Terke, Samuel L. Orthopedics: principles and their application Lippencott, New York 2000 2V
3. Magee, David J. Orthopedic and Physical Assessment Saunders, Philadelphia 2002
4. Maheshwari, J Essential Orthopedics
5. Solomon, Louis Apley's Systems of Orthopedics and Fracture Arnold, London 2001
6. McRae, R. and Esser, Max Practical Fracture Treatment Churchill Living stone, London 2002
7. Treatment and Rehabilitation of Fractures by hoppenfield, Lippincott Williams and Wilkins



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**Paper: GENERAL SURGERY INCLUDING CARDIO THORACIC SURGERY, PLASTIC SURGERY, OBSTETRICS AND GYNECOLOGY**

**Code: BPTC602**

**Contacts Hours / Week: 4**

**Credits: 4**

**Module 1: [12H]**

Principles of General Surgery and Anesthesia including blood transfusion and physiological response of the body to surgery

Pre and Post Operative complications and their management

Wounds: - Wound Infections, Sinuses and Ulcers. Burns- Different degrees. Complications of Burn specially post burn contractures, Tetanus, Gangrene and gas gangrene

**Module 2: [12H]**

Outline of Abdominal surgery, Post-Operative complications and management in-

Appendicectomy, Herniorrhaphy, Mastectomy, Thyroidectomy, Colostomy, Cholecystectomy, Ileostomy

Role of Physiotherapy in General Surgery

**Module 3: [12H]**

Cardio Thoracic Surgery

Incisions for cardiothoracic surgery, General Pre and Post-Operative Physiotherapeutic Management patients of cardiothoracic surgery, various surgical procedures for chest and cardiac condition/disease

**Module 4: [12H]**

Plastic Surgery

Burn- Degrees of burn, General management of burn, Reconstructive surgery following burn and complications of burn

Types of Skin Grafts and Flaps

Principles of Tendon transfer

Surgery of hand with emphasis on reconstructive surgery in Trauma and in Leprosy

**Module 5: [12H]**

Anatomy of Pelvic organs mechanism, physiology of pelvic floor, Sphincter muscles, Menstrual cycle, and its disorders, other hormonal disorders of females, Obesity and female hormones

Pregnancy and its stages, labour, stages of labour, delivery, Caesarian Section, Cancer of female reproductive organs, STD in females

Menopausal effects in emotion and musculo-skeletal system

Maternal physiology in pregnancy

Child birth complications, complication of multiple child birth, methods of birth control-Merits and Demerits

Hysterectomy



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**Paper: GENERAL SURGERY INCLUDING CARDIO THORACIC SURGERY, PLASTIC SURGERY, OBSTETRICS AND GYNECOLOGY PRACTICAL**

**Code: BPTC692**

**Contacts Hours / Week: 4**

**Credits: 2**

Same as Theory. [30H]

**Learning Outcomes:** This subject follows the basic science subjects to provide the knowledge about conditions the therapist would encounter in their practice in the community. The objective of this course is that after 60 hrs of lectures and discussion the student will be able to demonstrate an understanding of various aspects of health and disease list the methods of health administration, health education and disease preventive measures.

***Suggested Readings:***

**TEXT BOOKS: -**

1. Howkins, John Shaw's Textbook of Gynecology Orient-Longman, Bangalore 1971
2. Datta, D.C. Textbook of Obstetrics NCBA, Calcutta 2000
3. Mudaliar, A.L. Clinical Obstetrics Orient-Long main, Bangalore 1972 4 Percival, Robert Manual of Obstetrics ELBS, London 1973



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**Paper: GENERAL MEDICINE AND CARDIO THORACIC CONDITION AND PEDIATRICS**

**Code: BPTC603**

**Contacts Hours / Week: 4**

**Credits: 4**

Each disease to be discussed under the following headings: -

- Definition
- Aetio-pathogenesis.
- Pathology
- Clinical Features
- Diagnosis
- Differential Diagnosis
- Principles of Management including physiotherapeutic management

**Module 1: [5H]**

Introduction of Medicine

General principles of assessment and management including physiotherapeutic management. Elementary idea about use of laboratory and imaging techniques

Diseases of Respiratory System

Approach to a patient with Respiratory Disease, Chronic Obstructive Pulmonary Disease.

Bronchial Asthma, Pneumonia, Lung Abscess, Bronchiectasis, Pleural Effusion & Empyema

Pneumothorax, Pulmonary tuberculosis, Respiratory Failure, Interstitial Lung Disease

Pulmonary Embolism

**Module 2: [5H]**

Diseases of GI system & Hepato-Biliary Disorders

Peptic Ulcer Disease, Malabsorption Syndrome, Inflammatory Bowel Disease, Approach to a patients of G.I.S.Disease, Upper G.I.S. bleed, Jaundice , Viral Hepatitis, Cirrhosis of Liver

Acute Pancreatitis

Diseases of Kidney

Approach to a patient of Renal Disease, Glomerulo Nephritis, Acute Renal Failure, Chronic Renal Failure, Dialysis, Nephrotic Syndrome, Urinary Tract Infections

**Module 3: [5H]**

**Hematological Disease**

Approach to a. patient with hematological disease, Anemia & its different types, Leukemia

Haemophilia, Haemoglobinopathies, Purpura, Oncology- Lymphomas, Lung Carcinoma



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**Module 4: [5H]**

Endocrine & Metabolic Diseases

Acromegaly, Gigantism & Dwarfism, Diabetes Insipidus, Hypothyroidism, Hyperthyroidism

Adrenal hypo-function & hyper function, Diabetes Mellitus, Diabetic Neuropathy, Diabetic Foot

Hypoglycemia, Vit-D, Calcium metabolism & Parathyroid Gland Disorders, Lipid Disorders

Nutritional Diseases

Obesity, Protein Energy Malnutrition, Common Vitamin Deficiencies

**Module 5: [5H]**

Connective Tissue Diseases

Approach to a patient with Connective Tissue Disease, Rheumatoid Arthritis, Gout, Vasculitides

Infectious Diseases

Malaria, Filariasis, Tetanus, Kala-azar, Typhoid Fever, HIV & AIDS, Diarrhoeal Diseases

Diseases due to Environmental factors & Poisons

Heat Stroke, Radiation Injury, Snake Bite, General principles of management of poisoning

Organo-Phosphorus Poisoning, Sedative and hypnotic poisoning

**Module 6: [5H]**

Cardiology

Basic Anatomy of Heart, Coronary circulation.

Normal Cardiac contraction and relaxation mechanism

Acute Rheumatic Fever, Etiology, Clinical features and Assessment

Valvular Heart Diseases like Mitral Stenosis, Mitral Regurgitation, Aortic Stenosis, Aortic Regurgitation-

Clinical features and assessment

Ischemic Heart Disease- Clinical features and assessment

Hypertension- Types and management

Congestive Heart Failure

Peripheral Vascular Disease & Deep Vein thrombosis

Common Cardiac Arrhythmias

**Module 7: [6H]**

Pediatrics

Growth and development of a child from birth to 12 yrs of age indicating physical and adaptive developments.

Maternal and neonatal factors contributing to high-risk pregnancy.

Neonatal and Maternal infections.

Maternal heart diseases, renal failure, tuberculosis, diabetes etc.

Community Health Program like PPP; Blindness; Deafness and immunization Schedule.



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**Module 8: [6H]**

Cerebral Palsy- Definition, Outline of etiology of prenatal, perinatal and postnatal causes. classification, clinical features and assessment based on musculo skeletal system. Outline of associated defects like mental retardation, microcephaly, hearing and speech impairment, squint and convulsion.

Muscular Dystrophy- Various forms mode of inheritance, clinical manifestations and its management physiotherapeutic ally.

**Module 9: [6H]**

Spina Bifida, Meningo myelocele- Outline of development clinical manifestations, bladder bowel control, hydrocephalus

Stills Disease- classification, pathology in brief, physical findings, course and prognosis. Prevention and correction of deformity

Acute CNS infection- Classification, clinical findings, sequel leading to mental retardation, blind ness, deafness speech defect, motor paralysis, bladder and bowel problems, seizure disorders feeding difficulties and pressure sores.

**Module 10: [6H]**

Spina Bifida, Meningo myelocele- Outline of development clinical manifestations, bladder bowel control, hydrocephalus

Stills Disease- classification, pathology in brief, physical findings, course and prognosis. Prevention and correction of deformity

Acute CNS infection- Classification, clinical findings, sequel leading to mental retardation, blind ness, deafness speech defect, motor paralysis, bladder and bowel problems, seizure disorders feeding difficulties and pressure sores.

**Module 11: [6H]**

Normal diet for newborn and child, dietary calorie, fat, protein, minerals and vitamins requirements in normal child as well as in malnutral child.

Lung Infections- Outline of clinical finding complications of bronchitis's lung abscess, bronchial asthma, cystic fibrosis) primary complex in infants and children

Acute pediatric distress syndrome, neonatological & pediatric surgical care.

Neonatal and pediatric cardiovascular problems.



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**Paper: GENERAL MEDICINE AND CARDIO THORACIC CONDITION AND PEDIATRICS PRACTICAL**

**Code: BPTC693**

**Contacts Hours / Week: 4**

**Credits: 2**

|                       |
|-----------------------|
| Same as Theory. [30H] |
|-----------------------|

**Learning Outcomes:** This subject follows the basic science subjects to provide the knowledge about relevant aspects of general medicine. The student will have a general understanding of the diseases the therapist would encounter in their practice. The objective of this course is that discussion the student will be able to list the etiology, pathology, clinical features and treatment methods for various medical conditions.

***Suggested Readings:***

**TEXT BOOKS: -**

1. Chamberlin, E.N. and Ogilvie, C. Symptoms and signs in Clinical Medicine Jhon Wright 1974
2. Swash, Michael Hutchison's Clinical Methods W B Saunders, London 2000
3. Ghai, O. P. Essential Pediatrics Interprint, New Delhi 1987
4. Haslett, C. Davidson's Principal and Practice of Medicine Churchill Livingstone, London 1999



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**Duration:** 4½ Years

**Total Credit:** 196

**Total Marks:** 5700  
.....

**Semester –VII**

| Course Code  | Course Name   | L - T - P | Credits   | Course Type | Total Marks |
|--------------|---|-----------|-----------|-------------|-------------|
| BPTC701      | Neurology and Neurosurgery  | 4-0-0     | 4         | Core Course | 100         |
| BPTC791      | Neurology and Neurosurgery<br>Practical   | 0-0-4     | 2         | Core Course | 100         |
| BPTC702      | Physiotherapy in Surgery<br>Including Cardio Thoracic<br>Surgery, Plastic Surgery,<br>Obstetrics and Gynecology               | 4-0-0     | 4         | Core Course | 100         |
| BPTC792      | Physiotherapy in Surgery<br>Including Cardio Thoracic<br>Surgery, Plastic Surgery,<br>Obstetrics and Gynecology-<br>Practical | 0-0-4     | 2         | Core Course | 100         |
| BPTC703      | Physiotherapy in General<br>Medicine including Cardio<br>thoracic condition and<br>Pediatrics                                 | 4-0-0     | 4         | Core Course | 100         |
| BPTC793      | Physiotherapy in General<br>Medicine including Cardio<br>thoracic condition and<br>Pediatrics - Practical                     | 0-0-4     | 2         | Core Course | 100         |
| BPTS781      | Clinical Education I  | 0-0-4     | 2         | SEC2        | 100         |
| <b>TOTAL</b> |   |           | <b>20</b> |             | <b>700</b>  |



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.....  
**Duration:** 4½ Years

**Total Credit:** 196

**Total Marks:** 5700  
.....

**DETAILED SYLLABUS**

**Semester VII**

**Paper: NEUROLOGY AND NEUROSURGERY**

**Code: BPTC701**

**Contacts Hours / Week: 4**

**Credits: 4**

**Course Contents**

|   |
|---|
| <b>Module 1: [5H]</b><br>General Principles of clinical neurological assessment.  |
| <b>Module 2: [5H]</b><br>Cerebro-vascular disease, Hemiplegia<br>Acute infections of CNS – Encephalitis, Meningitis and Poliomyelitis<br>Traumatic Injury of Head & Spine, Paraplegia                               |
| <b>Module 3: [5H]</b><br>Parkinsonism and other Extra-pyramidal disorders, Involuntary movements<br>Demyelinating diseases including Multiple sclerosis   |
| <b>Module 4: [5H]</b><br>Dementia, Alzheimer’s disease<br>Cerebral Palsy<br>Intracranial tumors   |
| <b>Module 5: [5H]</b><br>ALS (Amyotrophic Lateral Sclerosis) & Other Motor Neuron disease<br>Disease/injury of peripheral nerves, cranial nerves & G.B. Syndrome<br>Cervical & Lumbar Spondylosis and Disc prolapse |
| <b>Module 6: [5H]</b><br>Myasthenia Gravis<br>Diseases of muscles like Polymyositis Muscular Dystrophy  |



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|--|
| <b>Module 7: [5H]</b><br><b>Neuro-Surgery</b><br>Principles of Management of Cranial & Spinal trauma<br>Orientation about Neuro-Surgical Intensive care  |
| <b>Module 8: [5H]</b><br>Elementary idea about minimal invasive surgery in Neurosurgical perspective<br>Developmental anomalies of CNS   |
| <b>Module 9: [5H]</b><br>Physiotherapeutic approach to Neurologically Disabled patients<br>Outline of clinical presentation of Brain Tumors & Spinal Cord Compression  |
| <b>Module 10: [5H]</b><br>Patho-physiology of peripheral nerve injury & its principles of management<br>Degenerative diseases of spine & its physiotherapeutic management<br>Physiotherapeutic management of Pain Syndrome |

**Paper: NEUROLOGY AND NEUROSUGERY PRACTICAL**

**Code: BPTC791**

**Contacts Hours / Week: 4**

**Credits: 2**

**Course Contents**

**PRACTICAL [30H]** - Practical shall be conducted for all the relevant topics discussed in theory in the following forms.

1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

**Learning Outcomes:** This subject follows the basic science subjects to provide the knowledge about relevant aspects of neurology & neurosurgery. The student will have a general understanding of the diseases the therapist would encounter in their practice. The objective of this course is that after 60 hrs of lectures and discussion the student will be able to list the etiology, pathology, clinical features and treatment methods for various neurological conditions.



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***Suggested Readings:***

**TEXT BOOKS: -**

1. Brains Diseases of the nervous system;12<sup>th</sup> edition; Michael Donaghy; Oxford University Press
2. Adams And Victor's Principles of Neurology;11<sup>th</sup> edition;Allan Ropper, Martin Samuels, Joshua Klein; McGraw Hill
3. Neurology and Neurosurgery Illustrated,5<sup>th</sup> edition; Lindsay, Bone and Fuller; Churchill Livingstone

**Paper: PHYSIOTHERAPY IN SURGERY INCLUDING GYNECOLOGY AND OBSTETRICS**

**Code: BPTC702**

**Contacts Hours / Week: 4**

**Credits: 4**

**Course Contents**

**Module 1: [15H]**

**Abdominal Surgery & Others**

Pre and Post Operative Physiotherapy management of following abdominal surgical conditions including incisions, pre and postoperative complications

- Total Gastrectomy, Partial Gastrectomy
- Appendisectomy
- Cholecystectomy
- Colostomy
- Herniorraphy
- Nephrectomy
- Radical Mastectomy

**Module 2: [15H]**

**Cardio thoracic Surgery:**

Introduction: - Incisions for cardio thoracic surgery, Drainage tubes & bottles, Ventilators- uses and functions, Physiotherapy during ventilator.

Pre and Post Operative physiotherapy management of following conditions.

- Thoracotomy



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- Lobectomy
- Thoracoplasty
- Pneumonectomy

Orientation about atelectasis, pneumothorax, pre and post operative physiotherapy management of cardiac surgery, open-heart surgery

**Module 3: [15H]**

**Plastic Surgery:**

- Burn & its classification Physiotherapy management.
- Pre and Postoperative physiotherapy of skin grafting
- Physiotherapy of cases after reconstructive surgery of hand.
- Various physiotherapy modalities and treatment techniques for the above mentioned conditions

**Module 4: [15H]**

**Obstetrics & Gynecology:**

Brief review of the following surgical conditions and various physiotherapeutic modalities, aims, means and techniques of physiotherapy should be taught

1. Hysterectomy
2. Prolapsed Uterus
3. Antenatal and postnatal care
4. Pregnancy and its stages, labor, stages of labor, delivery, Caesarian Section, Diastasis Recti etc
5. Child birth complications, complication of multiple child birth

**Paper: PHYSIOTHERAPY IN SURGERY INCLUDING GYNECOLOGY AND OBSTETRICS PRACTICAL**

**Code: BPTC792**

**Contacts Hours / Week: 4**

**Credits: 2**

**Course Contents**

**PRACTICAL [30H]** - Practical shall be conducted for all the relevant topics discussed in theory.



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**Learning Outcomes:** The subject is designed to provide knowledge in assessing and planning physiotherapy interventions for Gynecological and various Surgical conditions. The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs, student must know emergency drugs indication and contra-indication, care in intensive care unit (ICU) and to provide appropriate interventions to the patient.

***Suggested Readings:***

**TEXT BOOKS: -**

1. Cash's Textbook of General Medical and Surgical Conditions for Physiotherapists; 2<sup>nd</sup> edition; Joan Cash, Patricia Downey; Mosby Publishers
2. Textbook Of Physiotherapy in Surgical Conditions; Pushpal K Mitra; Jaypee Publishers.
3. Physiotherapy in Obstetrics and Gynaecology; Polden and Mantle; Jaypee Publishers

**Paper: PHYSIOTHERAPY IN GENERAL MEDICINE INCLUDING PAEDIATRICS**

**Code: BPTC703**

**Contacts Hours / Week: 4**

**Credits: 4**

**Course Contents**

**Module 1: [8H]**

**A. General Medicine**

Review of the Pathological and principles of management by Physiotherapy to the following conditions:

1. **Inflammation** – acute, chronic
2. **Oedema** – Traumatic, obstructive, Paralytic, Oedema due to poor muscle and laxity of the fascia
3. Arthritis and Allied Conditions (in details):
  - a) Osteoarthritis – generalised, Degenerative and traumatic, Spondylosis and disorders.
  - b) Rheumatoid Arthritis, Still's disease, infective Arthritis.
  - c) Spondylitis, Ankylosing Spondylitis.
  - d) Nonarticular Rheumatism – Fibrositism, Myalgia, bursitis, Periarthritis etc.

**Module 2: [8H]**

1. **Common conditions of Skin** – Acne, Psoriasis, Alopecia, Leucoderma, Leprosy, Sexually transmitted diseases.
2. **Deficiency diseases** – Rickets, Diabetes, Obesity, Osteoporosis and other deficiency disorders related to Physiotherapy
3. **Psychiatric Disorders** – Psychosis, Psychoneurosis, Senile dementia.



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**Module 3: [8H]**

**B. Respiratory Diseases**

- 1) Review of mechanism of normal respiration.
- 2) Chest examination, including auscultation, percussion.
- 3) Knowledge of various investigative procedures (invasive & noninvasive) used in the diagnosis of various respiratory disorders.

**Module 4: [9H]**

Review of pathological changes and principle of management by physiotherapy of the following conditions:

- 1) Bronchitis, Asthma, Lung abscess, Bronchiectasis, Emphysema, COPD.
- 2) Pleurisy and Empyema, Pneumonia
- 3) Bacterial Disease
- 4) Rheumatic fever, Carcinoma of respiratory tract
- 5) Paralysis of diaphragm & vocal cords
- 6) Chest wall deformities.

**Module 5: [9H]**

**C. Cardiovascular Diseases**

- 1) Review of anatomy & physiology of the cardiovascular system.
- 2) Knowledge of various investigative procedures (invasive & noninvasive) used in the diagnosis of various cardiovascular disorders.

**Module 6: [9H]**

3) Review of pathological changes and principle of management by physiotherapy of the following conditions:

Thrombosis, Embolism, Buerger's diseases, Arteriosclerosis, Thrombophlebitis, Phlebitis, Gangrene, Congestive Cardiac failure, Hypertension, Hypotension, Aneurysm

**Module 7: [9H]**

**D. Pediatrics**

Growth and development- Maternal and neonatal fracture contributing to high risk baby, CP, Myopathy, Spinabifida, Still's disease, Acute CNS infection, Lung infection, CTEV, CDH, Erb's palsy and arthrogryphosis multiplex congenita



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**Paper: PHYSIOTHERAPY IN GENERAL MEDICINE INCLUDING PAEDIATRICS  
PRACTICAL**

**Code: BPTC793**

**Contacts Hours / Week: 4**

**Credits: 2**

**Course Contents**

**PRACTICAL [30H]-** Practical shall be conducted for all the relevant topics discussed in theory.

**Learning Outcomes:** The subject is designed to provide knowledge in assessing and planning physiotherapy interventions for various medical/pediatrics conditions. The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs, student must know emergency drugs indication and contra-indication, care in intensive care unit (ICU) and to provide appropriate interventions to the patient.

***Suggested Readings:***

**TEXT BOOKS: -**

1. Cash textbook of chest heart and vascular disorders for physiotherapists; Joan Cash, Patricia Downey; Mosby Publishers
2. Cash's Textbook of General Medical and Surgical Conditions for Physiotherapists; 2<sup>nd</sup> edition; Joan Cash, Patricia Downey; Mosby Publishers



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**Paper: CLINICAL EDUCATION I**

**Code: BPTS781**

**Contacts Hours / Week: 4**

**Credits: 2**

|  |
|--|
| <b>Module 1: [3H]</b><br>Physiotherapy OPD                   |
| <b>Module 2: [3H]</b><br>Neurology, Neurosurgery & Neuro ICU |
| <b>Module 3: [3H]</b><br>General Surgery & CTS ICU           |
| <b>Module 4: [3H]</b><br>General Medicine & MICU             |
| <b>Module 5: [3H]</b><br>Orthopedics                         |

**Learning Outcomes:** Students will be posted in rotation in the following areas/wards. The students will be clinically trained to provide physiotherapy care for the patients under supervision. They will be trained on bed side approach, patient assessment, performing special tests, identifying indications for treatment, ruling out contraindications, decision on treatment parameters, dosage and use relevant outcome measures under supervision. Evidence based practice will be part of training.



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.....  
**Duration:** 4½ Years

**Total Credit:** 196

**Total Marks:** 5700  
.....

**Semester –VIII**

| Course Code  | Course Name  | L – T – P | Credits   | Course Type | Total Marks |
|--------------|--|-----------|-----------|-------------|-------------|
| BPTC801      | Physiotherapy in Orthopedics                           | 4-0-0     | 4         | Core Course | 100         |
| BPTC891      | Physiotherapy in Orthopedics- Practical                | 0-0-4     | 2         | Core Course | 100         |
| BPTC802      | Physiotherapy in Neurology and Neurosurgery            | 4-0-0     | 4         | Core Course | 100         |
| BPTC892      | Physiotherapy in Neurology and Neurosurgery- Practical | 0-0-4     | 2         | Core Course | 100         |
| BPTC803      | Community Based Rehabilitation                         | 3-1-0     | 4         | Core Course | 100         |
| BPTC804      | Research methodology and Biostatistics                 | 3-1-0     | 4         | Core Course | 100         |
| BPTS881      | Clinical Education II                                  | 0-0-4     | 2         | SEC3        | 100         |
| <b>TOTAL</b> |  |           | <b>22</b> |             | <b>700</b>  |



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.....  
**Duration:** 4½ Years  
**Total Credit:** 196  
**Total Marks:** 5700  
.....

**DETAILED SYLLABUS**  
**Semester VIII**

**Paper: PHYSIOTHERAPY IN ORTHOPEDICS**  
**Code: BPTC801**  
**Contacts Hours / Week: 4**  
**Credits: 4**

**Course Contents**

**Module 1: [5H]**

Introduction to Orthopaedics: Introduction to orthopaedic terminology. Types of pathology commonly dealt with, clinical examination, common investigations X- rays & imaging techniques and outline of non – operative management.

Principles of operative treatment: List indications, contraindication and briefly outline principles of: Athrodesis, Arthroplasty, Osteotomy, Bonegrafting, Tendon – Transfers and Arthroscopy.

**Module 2: [4H]**

Sprains and Muscle Strains: List common sites of sprains and muscle strains and describe the clinical manifestations and treatment. viz. Tennis Elbow, Golfer’s Elbow, Dequervain’s disease, Tenovaginitis, Trigger finger, Carpal Tunnel Syndrome and Plantar Fascitis etc.

Sports Injuries: Injuries related to common sports their classification and management.

**Module 3: [5H]**

**Fractures and Dislocations:** General Principles, outline the following:

- i) Types of Fractures including patterns. Open and closed fractures and fracture – dislocations
- ii) Differences between dislocation & subluxation.
- iii) General & Local signs & symptoms of fractures & dislocation.
- iv) Principle of management of fractures & dislocations.
- v) Prevention & treatment of complications including: Fracture – disease, Volkmann’s Ischemic Contracture, Sudeck’s Atrophy, Carpal Tunnel Syndrome. Myositis Ossificans and Shoulder-Hand syndrome
- vi) Fracture healing.



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**Module 4: [5H]**

**Upper Limb Fractures & Dislocations**

- a) Enumerate major long bone fractures and joint injuries.
- b) Briefly describe their clinical features, principles of management and complications.

**Lower Limb Fractures & Dislocations**

- a) Enumerate major long bone fractures and joint injuries.
- b) Briefly describe their clinical features, principles of management and complication.

**Module 5: [5H]**

**Spinal Fractures and Dislocations:** Outline the mechanism, clinical features, principles of management and complications of spinal injuries.

**Recurrent Dislocations:** Outline the mechanism, clinical features, principles of management and complications of recurrent dislocation of the shoulder and patella.

**Module 6: [4H]**

**Amputations**

- a) Classify amputations. List indication for surgery.
- b) Outline pre-operative, operative and prosthetic management.
- c) Outline prevention and treatment of complications.

**Module 7: [4H]**

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

**Bone Joint Tumors:** Classify and outline the clinical features, management and complications of the following (benign / malignant bone and joint tumors, Osteomas, Osteosarcomas, Osteoclastomas, Ewing's sarcoma, Multiplemyeloma).

**Module 8: [4H]**

**Chronic Arthritis:** Outline of pathology: clinical features, mechanism of deformities, management and complications of: Rheumatoid arthritis. Osteoarthritis of major joints and spine, Ankylosing spondylitis. Neck & Back Pain, Painful Arc Syndrome, Tendinitis, Fascitis & Spasmodic Torticollis, (Outline the above including clinical features and management)

**Module 9: [4H]**

**Spinal and Other Deformities:** Classify spinal deformities and outline the salient clinical features, management and complications of Scoliosis, Kyphosis and Lordosis, Cervical Rib, Common acquired deformities of foot, knee, hip, shoulder, elbow and wrist including hand

**Module 10: [4H]**

**Poliomyelitis:** Describe the pathology, microbiology, prevention, management and complications of polio. Outline the treatment of residual paralysis including use of orthosis, Principles of muscle transfers and corrective surgery



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**Module 11: [4H]**

**Congenital Deformities:** Outline the clinical features and management of Congenital Talipes Equino Varus (CTEV), Congenital Dislocation of the Hip, Flat foot, vertical talus, limb deficiency (radial club hand and femoral, tibial and fibula deficiencies) meningomyelocele, Arthrogyphosis multiplex congenita and Osteogenesis imperfect

**Module 12: [4H]**

**Peripheral Nerve Injuries:** Outline the clinical features and management, including reconstructive surgery of:

- a) Radial, median and ulnar nerve lesions.
- b) Sciatic and lateral popliteal lesions.
- c) Brachial Plexus injuries including Erbs, Klumpke's and crutch palsy, Claw Hand

**Module 13: [4H]**

**Hand Injuries:** Outline of clinical features, management and complications of: Skin and soft tissue injury, tendon injury, bone and joint injury.

**Module 14: [4H]**

**Leprosy:** Outline of clinical features, management and complications of neuritis, muscle paralysis, tropic ulceration and hand & feet deformities.

**Paper: PHYSIOTHERAPY IN ORTHOPEDIC PRACTICAL**

**Code: BPTC891**

**Contacts Hours / Week: 4**

**Credits: 2**

**Course Contents**

**PRACTICAL [30H]** - Practical shall be conducted for all the relevant topics discussed in theory in the following forms

1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.



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**Learning Outcomes:**

On completion of the contents of this paper, the students are expected to have a detailed understanding of the various orthopaedic conditions commonly encountered by clinicians and the physiotherapeutic management thereof. They should also be able to demonstrate the various manual therapy techniques used for orthopaedic rehabilitation.

***Suggested Readings:***

**TEXT BOOKS: -**

1. Tidy's physiotherapy.
2. Textbook of orthopedics- Cash.
3. Clinical orthopedic rehabilitation- Brotzman.
4. Orthopedic physiotherapy - Jayant Joshi.
5. Physical Rehabilitation Assessment and Treatment – O'Sullivan Schmitz
6. Sports physiotherapy- Maria Zuluaga



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**Paper: PHYSIOTHERAPY IN NEUROLOGY AND NEUROSURGERY**

**Code: BPTC802**

**Contacts Hours / Week: 4**

**Credits: 4**

**Course Contents**

**Neurology**

**Module 1: [11H]**

Introduction:

Brief review of the following neurological conditions and various modalities of physiotherapy, aims, means and technique of physiotherapy should be taught.

- Hemiplegia
- Cerebral palsy
- Tetraplegic syndrome

**Module 2: [7H]**

Multiple sclerosis

Parkinson's disease

Extra Pyramidal Lesion

**Module 3: [7H]**

Tabes Dorsalis

Transverse Myelitis

Polio myelitis

Syringomyelia

**Module 4: [7H]**

Motor Neuron Disease

Poly Neuritis Ataxia

Peripheral Neuropathy

**Module 5: [7H]**

Peipheral Nerve Injuries

Sciatica

Brachial Neuritis and Neuralgia

Facial Palsy & Bell's Palsy



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**Module 6: [7H]**

Monoplegia

Myopathy and Muscular Dystrophy

Sub-acute Combined Degeneration of Spinal Cord

General and Physiotherapeutic Management of Psychiatric Patients

**Neurosurgery**

**Module 7: [7H]**

Pre and Post operative physiotherapeutic management of Neuro- Surgical conditions and complications

Peripheral Nerve Injuries

**Module 8: [7H]**

Pre and Post operative physiotherapeutic management of Nerve Repair / Grafting.

P. T. in Head Injury, Laminectomy, Surgery following Brain Tumour and Craniotomy etc.

**Paper: PHYSIOTHERAPY IN NEUROLOGY AND NEUROSURGERY PRACTICAL**

**Code: BPTC892**

**Contacts Hours / Week: 4**

**Credits: 2**

**Course Contents**

**PRACTICAL [30H]-** Practical shall be conducted for all the relevant topics discussed in theory in the following forms

1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

**Learning Outcomes:**

This subject aims to instill in the students detailed understanding and capability to independently assess and treat various neurological conditions as commonly encountered in a neuro-physiotherapy setting.



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***Suggested Readings:***

**TEXT BOOKS: -**

1. Bobath, Berta Adult Hemiplegia: Evaluation and treatment Butterworth, Oxford 1990
2. Shepherd, R.B. Physiotherapy in Paediatrics; Butterworth Heinemann, Oxford 1995
3. Downie, P.A. Cash's Textbook of Neurology for Physiotherapy Jaypee, New Delhi 1993
4. Swaner, K.A. and LaVigne, J.M. Brunstrom's Movement Therapy in Hemi Lippincott, New York 1992
5. Burns, Y.R. and Macdonald J. Physiotherapy and the Growing Child Harcourt, Singapore 1998
6. Bromley, Ida Tetraplegia and Paraplegia Churchill-Livingston, London 1998
7. Voss, Dorothy Proprioceptive Neuromuscular Facilitation Lippincott, New York 1989 9 Adler,
8. Susan Adler; PNF in Practice Springer, New York 2003
9. Carr, J.H. and Shepherd, R.B. Stroke Rehabilitation Butterworth Heinemann, Singapore 2003

**Paper: COMMUNITY BASED REHABILITATION**

**Code: BPTC803**

**Contacts Hours / Week: 3+1**

**Credits: 4**

**Course Contents**

|  |
|--|
| <b>Module 1: [4H]</b><br>Introduction  |
| <b>Module 2: [4H]</b><br>Definition concerned in the phases of disability process, explanation of its aims & principles, Scope of rehabilitation, (Impairment, Disability, Handicap) |
| <b>Module 3: [5H]</b><br>Definition concerned with the causes of Impairment Functional limitation and Disability   |
| <b>Module 4: [5H]</b><br>Disability Prevention. Limitation & Rehabilitation.   |
| <b>Module 5: [5H]</b><br>Present Rehabilitation Services   |



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|--|
| <p><b>Module 6: [5H]</b><br/>Legislations for rehabilitation services for the Disabled, P.W.D.Act / Compensations and benefits available for disabled</p>  |
| <p><b>Module 7: [4H]</b><br/>Rehabilitation Team &amp; its members, their role.</p>  |
| <p><b>Module 8: [4H]</b><br/>Contribution of Social Worker towards rehabilitation</p>  |
| <p><b>Module 9: [4H]</b><br/>Vocational evaluation &amp; Goals for disabled, role of Vocational Counselor.</p>   |
| <p><b>Module 10: [4H]</b><br/>Principles of Communication &amp; its problems: -</p> <ul style="list-style-type: none"><li>• Speech Production</li><li>• Communication disorders secondary to Brain Damage.</li><li>• Aphasia &amp; its treatment.</li><li>• Evaluating Language.</li><li>• Disarthria &amp; its treatment</li></ul> <p>• Non-Aphasic language disorders</p>  |
| <p><b>Module 11: [4H]</b><br/>Architectural barriers possible modifications in relation to different disabled conditions – namely Hemiplegia, Paraplegia, Amputees, Cerebral Palsy etc.</p>  |
| <p><b>Module 12: [4H]</b><br/>Community Health: a. Introduction to community Health, Definition of Community and Health, Health Determinants</p> <p>b. Community and Rehabilitation – Definition, Concepts and Team , Community Health in relation to rural and urban health setup</p> <p>c. Community based rehabilitation Vs Institutional based rehabilitation – Merits and demerits</p> <p>d. Community Resources in rural and urban set up</p> <p>e. Rehabilitation – Team work, members, their duties and responsibilities</p> |
| <p><b>Module 13: [4H]</b><br/>Prostheses and Orthoses</p> <ul style="list-style-type: none"><li>• Definition and Basic Principles</li><li>• Designing and Construction of Upper &amp; Lower extremity Orthosis &amp; Spinal Orthosis.</li><li>• Upper Extremity prosthesis: Prescription, fitting and checking</li><li>• Lower. Extremity prosthesis: Prescription, fitting and checking</li><li>• Prescription and design of footwear- &amp; its modification.</li></ul>  |



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- Wheel Chairs.
- Design and construction of adoptive devices
- Classification of Aids & Appliances
- Ambulatory Aids & Assistive Devices
- Measurement and P.O.P. cast techniques.
- Simple splint techniques
- Low cost thermo-labile material for construction of Orthosis.
- Practical demonstration of orthoses /prostheses /mobility aids & assistive aids.

**Module 14: [4H]**

Professional Ethics

Implications of and confirmation to the rules of professional conduct

**Learning Outcomes-**

This course provides students with an understanding of the different levels of disability encountered and techniques of rehabilitation for the same. This course highlights the importance of the working of a complete rehabilitation team as a unit and preventative measures undertaken to decrease the occurrence of disabilities.

***Suggested Readings:***

**TEXT BOOKS: -**

1. Physical Rehabilitation Book by Susan B. O'Sullivan
2. DeLisa's Physical Medicine and Rehabilitation: Principles and Practice, Two Volume ... Book by Joel DeLisa
3. Essentials of Community based Rehabilitation by SatyaBhushan Nagar
4. Textbook of Preventive Practice and Community Physiotherapy by Chief Editor DrBharati Vijay Bellare and Sub Editors PavithraRajan and DrUnnati Nikhil Pandit, Jaypee Brothers Medical Publishers
5. Essentials Of Prosthetics & Orthotics With MCQs & Disability Assessment Guidelines by AK AGARWAL, Jaypee Brothers Medical Publishers



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**Paper: RESEARCH METHODOLOGY AND BIOSTATISTICS**

**Code: BPTC804**

**Contacts Hours / Week: 3+1**

**Credits: 4**

**Course Contents**

**Module 1: [6H]**

Introduction to Research methodology: Meaning of research, objectives of research, Motivation in research, Types of research & research approaches, Research methods vs methodology, Criteria for good research, Problems encountered by researchers in India.

Introduction to Biostatistics: Meaning, definition, characteristics of statistics., Importance of the study of statistics, Branches of statistics, Statistics and health science including physiotherapy, Parameters and Estimates, Descriptive and inferential statistics, Variables and their types, Measurement scales.

**Module 2: [6H]**

Research problem: Statement of research problem., Statement of purpose and objectives of research problem, Necessity of defining the problem

**Module 3: [6H]**

Research design: Meaning of research design, Need for research design, Features for good design, Different research designs, Basic principles of research design

**Module 4: [6H]**

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

**Module 5: [6H]**

Measurement & scaling techniques: Measurement in research- Measurement scales, sources of error in measurement, Technique of developing measurement tools, Meaning of scaling, its classification. Important scaling techniques.

**Module 6: [6H]**

Methods of data collection: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules.



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**Module 7: [6H]**

Sampling fundamentals, need for sampling & some fundamental definitions, important sampling distributions.

**Module 8: [6H]**

Processing & analysis of data: Processing operations, problems in processing, Types of analysis, Statistics in research (Parametric and Non-Parametric tests), Measures of central tendency, Dispersion, Asymmetry, relationship.

Tabulation of Data: Basic principles of graphical representation, Types of diagrams – histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve.

**Module 9: [6H]**

Testing of hypothesis: What is hypothesis? Basic concepts concerning testing of hypothesis, Procedure of hypothesis testing, measuring the power of hypothesis test, Tests of hypothesis, limitations of the tests of hypothesis

**Module 10: [6H]**

Computer technology: Introduction to Computers, computer application in research, computers & researcher.

**Learning Outcomes:** The objective of these modules is to help the students to understand the basic principles of research and methods applied to draw inferences from the research findings.

**Suggested Readings:**

**TEXT BOOKS: -**

1. Research Methodology and Biostatistics Application 2016 by Sharma, Elsevier
2. Essentials of Research Methodology for All Physiotherapy and Allied Health Sciences:by S. N Senthil Ramalingam, A. Thangamani;Kumar
3. Biostatistics & Research Methodologyby G. NageswaraRao
4. ABC of Research Methodology and Applied Biostatisticsby MN Parikh and NithyaGogtay
5. Introduction to Biostatistics and Research Methods,Textbook by J. Richard and P. S. S. SundarRao



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**Paper: CLINICAL EDUCATION II**

**Code: BPTS881**

**Contacts Hours / Week: 4**

**Credits: 2**

|   |
|---|
| <b>Module 1: [3H]</b><br>Physiotherapy OPD                                |
| <b>Module 2: [3H]</b><br>Neurology, Neurosurgery & Neuro ICU              |
| <b>Module 3: [3H]</b><br>General Surgery & CTS ICU                        |
| <b>Module 4: [3H]</b><br>Community-PHC                                    |
| <b>Module 5: [3H]</b><br>Orthopedics                                      |
| <b>Module 6: [3H]</b><br>General Medicine & MICU                          |
| <b>Module 7: [3H]</b><br>Developmental Pediatrics & Child Guidance Clinic |
| <b>Module 8: [3H]</b><br>OBG  |
| <b>Module 9: [3H]</b><br>Geriatric – Old Age Homes                        |
| <b>Module 10: [3H]</b><br>Industrial Visits - Ergonomics                  |



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Programme and Detailed Syllabus Structure 2021

**(As per UGC CBCS Template)**

**Learning Outcomes:** Students will be posted in rotation in the following areas/wards. The students will be clinically trained to provide physiotherapy care for the patients under supervision. They will be trained on bed side approach, patient assessment, performing special tests, identifying indications for treatment, ruling out contraindications, decision on treatment parameters, dosage and use relevant outcome measures under supervision. Evidence based practice will be part of training.



**SWAMI VIVEKANANDA UNIVERSITY**

Telinipara, Barasat-Barrackpore Road, Bara Kanthalia, WB - 700121

School of Allied Health Sciences

Bachelor of Physiotherapy (BPT)

Programme and Detailed Syllabus Structure 2021

(As per UGC CBCS Template)

.....  
**Duration:** 4½ Years

**Total Credit:** 196

**Total Marks:** 5700  
.....

**Semester –IX**

| Course Code | Course Name | Duration | Credit | Course Type       | Total Marks |
|-------------|-------------|----------|--------|-------------------|-------------|
| BPTS981     | Internship  | 6 months | 16     | Skill Development | 100         |

**Paper: INTERNSHIP**

**Code: BPTS981**

**Credits: 16**

1152 hours (calculated based on 8 hours per day, if 144 working days in six-month span)

**Course Contents**

**1. Initial Assessment Documentation:** Clinical staff must document the following information:

- a. Initial assessment documented based on SOAP format.
- b. Subjective examination (symptomatic)
- c. Objective examination (measurable, observable)
- d. Action/Analysis (interpretation of current condition/intervention provided)
- e. Plan of action
- f. Written or verbal feedback to the client or other relevant carers
- g. Discharge plan documented
- h. Agreement to treatment plan by patient or “person responsible”

**2. Progress Documentation:** Progress documentation may include the following information:

- a. Any individual intervention should be documented in SOAP format (including response to intervention/s using outcome measures)
- b. Oral consent obtained and documented when there is a significant change in treatment/ treatment options/ status of patient’s health.



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- c. Written consent obtained for designated invasive procedures
- d. Change in status or events that may affect discharge plans/goals
- e. Documented consultation with key clinical team members

**Course Outcomes:** The internship time period provides the students the opportunity to continue to develop confidence and increased skill in simulation and treatment delivery. Students will demonstrate competence in beginning, intermediate, and advanced procedures in both areas. Students will participate in advanced and specialized treatment procedures. The student will complete the clinical training by practicing all the skills learned in classroom and clinical instruction. The students are expected to work for minimum 8 hours per day. The students will be allocated to complete their curriculum internship outside of the university campus. A report has to be submitted by the students prior to successful completion of internship. The certificate may be issued by the concerned organization.