

# **CURRICULUM FOR**

## **Bachelor of Physiotherapy**

(Applicable w.e.f. academic session 2018-19)

**COURSE NAME:** Bachelor of (**Physiotherapy**)

**DURATION OF COURSE:** 4<sup>1/2</sup> YEARS

**FULL-TIME/ PART – TIME:** FULL-TIME

**SRI GURU RAM DAS UNIVERSITY OF HEALTH SCIENCES,  
SRI AMRITSAR, PUNJAB**

## **1. Bachelor of Physiotherapy**

BPT or Bachelor of Physiotherapy is an under graduate academic course in a medical Science field known as Physiotherapy. Physiotherapy uses physical agents like exercise, massage and other modalities for providing treatment to those patients whose movement and function are threatened by ageing, injury, and disease or environment factors. Physical Therapy programs provide core skills like manual therapy, therapeutic exercise and the application of electro physical modalities to the prospective students. Physiotherapy is very challenging and demanding as one may need to work for long hours and have tremendous patience as some patients may not respond to immediate treatment. Apart from rigorous education, one needs to have lots of physical stamina because of the nature of the work. An individual seeking a physical therapy career should have excellent interpersonal skills in order to get the best from his patients.

This is a regular theory & practical oriented program. The mode of teaching will be in the form of regular classrooms, lectures / demonstrations supplemented by handouts, manuals, brochures, checklists, performance with supervised clinical practices.

## **2. Duration of Course**

The Bachelor of Physiotherapy Course is proposed to be a 4(1/2) years integrated degree course.

## **3. Eligibility Criteria for Admission**

The students shall be admitted as per the admission criteria and qualification prescribed in the Notification issued by the Board of Management of Sri Guru Ram Das University of Health Sciences from time to time.

## **4. Medium of Instructions**

The Medium of instruction during the course and for the university examination shall be in English.

## **5. Examination Scheme**

5.1 The examination for the first, second, third year and fourth year shall ordinarily be held twice year in the months of May/June and November/ December by the Institute as per University rules.

5.2 Annual Examination shall be held in May/June and supplementary within 6 months of annual examination.

5.3 The examination in theory/practical shall be held at the end of the 1<sup>st</sup> academic year (1<sup>st</sup> Year) and the end of 2<sup>nd</sup> academic year (2<sup>nd</sup> Year) and third exam at the end of the 3<sup>rd</sup> academic year (3<sup>rd</sup> Year) and the end of 4<sup>th</sup> academic year (4<sup>th</sup> Year) with one internal and one external examiners.

5.4 Date of examination and appointment of examiner will be made by the Board of Management on recommendation of Faculty of Medical Sciences.

5.5 The examination for the first, second, third year and fourth year of Bachelor of Physiotherapy Course would be held according to the prescribed syllabus.

## **6. Rules of Examination for Bachelor of Physiotherapy Course:**

6.1 The students shall submit his/her application for admission to the examination to Controller of Examinations SGRDUHS, Sri Amritsar through the Director Principal of the SGRDIMSAR, Sri Amritsar on the prescribed form with the required fee (the last date of

which will be updated on university website after notification issued from Board of Management time to time).

- 6.2 The candidates will be given 20 marks for theory and 20 marks for practical as internal assessment in each subject on the basis of their performance during the year. That a candidate be eligible to appear in the examination provided he/she secured a minimum of 35% marks in internal assessment in theory and practical.
- 6.3 There will be fresh internal assessment and compulsory attendance for the students for the examination in which he/she has failed at the time of subsequent examination in that subject.
- 6.4 The students will not be allowed to appear in the examination unless he/she attends 75% of the total theory and practical in each subject separately.
- 6.5 Director Principal of the college is empowered to condone the shortage of attendance of lectures to the extent of 5% lectures delivered in each course of theory and practical.
- 6.6 A student will be deemed to have passed in the examination if he/she passes in each subject separately.
- 6.7 In case of students joining late owing to the late admission with the approval of the Vice-chancellor, their lecturers are to be counted from the date of joining. Deficiency in studies should be made up by attending special classes for them at the level of Head of the Department.

**7. First Year Bachelor of Physiotherapy Examination:**

The First Year Bachelor of Physiotherapy examination shall be in the following subjects and candidate shall be required to pass all the subjects:-

Subject	Theory		Practical	
	Marks	Internal Assessment	Marks	Internal Assessment
Anatomy	80	20	80	20
Physiology	80	20	80	20
Biochemistry	80	20	---	---
Exercise Therapy – I	80	20	80	20
Electrotherapy – I	80	20	80	20
Sociology & Community Health	50	50	---	---

**8. Second Year Bachelor of Physiotherapy Examination:**

The Second Year Bachelor of Physiotherapy Examination shall be open to a person who has previously passed the First Year Bachelor of Physiotherapy Examination of this University.

Subject	Theory		Practical	
	Marks	Internal Assessment	Marks	Internal Assessment
Pathology & Microbiology	40+40	10+10	---	---
Pharmacology	80	20	---	---

Electrotherapy – II	80	20	80	20
Exercise therapy – II	80	20	80	20
Biomechanics	80	20	---	---
Psychology	50	---	---	---

### 9. **Third Year Bachelor of Physiotherapy Examination:**

The Third Year Bachelor of Physiotherapy Examination shall be open to a person who has previously passed the Second Year Bachelor of Physiotherapy Examination of this University.

Subject	Theory		Practical	
	Marks	Internal Assessment	Marks	Internal Assessment
Orthopedics	80	20	80	20
General Medicine	80	20	80	20
PT in Ortho Condition	80	20	80	20
PT in Medical Condition – I	80	20	80	20
Research Methodology and Biostatistics	80	20	---	---
Neurology	80	20	80	20

### 10. **Fourth Year Bachelor of Physiotherapy Examination:**

The Fourth Year Bachelor of Physiotherapy Examination shall be open to a person who has previously passed the Third Year Bachelor of Physiotherapy Examination of this University.

Subject	Theory		Practical	
	Marks	Internal Assessment	Marks	Internal Assessment
General Surgery	80	20	80	20
Community Physiotherapy & Rehabilitation	80	20	80	20
Pediatrics & Geriatrics	80	20	80	20
PT in Medical Conditions – II	80	20	80	20
PT in Surgical Conditions	80	20	80	20
Clinical Training	---	---	---	300

### 11. **Promotion and Number of Attempts allowed**

- 11.1 A candidate who fails in all the subjects in the First Year Bachelor of Physiotherapy examination shall not be promoted to Second Year class.
- 11.2 A Candidate who fails in one more or more subjects will be given four attempts (Including first attempt as a regular candidate) at six monthly intervals to pass in those subjects. However, if he/she fails to pass in those subjects four extra attempts plus one mercy chance at the discretion

- of the Vice-Chancellor, failing which he/she will have to appear in all the subjects of the examination otherwise he/she will be required repeat the whole examination of 1<sup>st</sup> Year.
- 11.3 The candidate who will absent himself/herself from the examination will be deemed to have been failed in that subject.
- 11.4 A candidate who passes in at least one subject of University level First Year Bachelor of Physiotherapy examination will be permitted to attend classes of Second Year. However, the candidate will be required to pass in all subjects of 1<sup>st</sup> Year examination at least 6 months before the final examination of 2<sup>nd</sup> Year examination.
- 11.5 A candidate who fails in all subjects in the second year Bachelor of Physiotherapy examination shall not be promoted to Third Year class.
- 11.6 A candidate who passes in at least one subject of University level Second Year Bachelor of Physiotherapy examination will be permitted to attend classes of Third Year. However, the candidate will be required to pass in all subjects of 2<sup>nd</sup> Year examination at least 6 months before the final examination of 3<sup>rd</sup> Year examination.
- 11.7 Candidate who passes in one or more subjects of Second Year Bachelor of Physiotherapy examination shall be exempted from appearing in this subject at a subsequent examination, but the candidate must pass the examination in a maximum of four attempts including first attempt, as a regular candidate plus one mercy chance at the discretion of the Vice-Chancellor, failing which he/she will have to appear in all the subjects of the examination.
- 11.8 Candidate who passes in one or more subjects of Third Year Bachelor of Physiotherapy examination shall be exempted from appearing in these subject at a subsequent examination, but the candidate must pass the examination in a maximum of four attempts (including first attempt, as a regular candidate), plus one mercy chance at the discretion of the Vice-Chancellor, failing which he/she will have to appear in all the subjects of the examination.
- 11.9 Candidate who passes in one or more subjects of Fourth Year Bachelor of Physiotherapy examination shall be exempted from appearing in these subject at a subsequent examination, but the candidate must pass the examination in a maximum of four attempts (including first attempt, as a regular candidate), plus one mercy chance at the discretion of the Vice-Chancellor, failing which he/she will have to appear in all the subjects of the examination.

## **12. Appointments of Examiners:**

- 12.1 There shall be two examiners – One internal and one external.
- 12.2 Professor & head of the Department shall be Convener. The Examiner at least 3 Years post PG teaching experience in that specification field will be appointed as Internal Examiner.

12.3 The external examiner shall be appointed from other Universities at least 3 years post PG teaching experience in that specification field.

**13. Paper Setting and moderation of Question Papers**

The questions papers for 1<sup>st</sup> Year, 2<sup>nd</sup> Year, 3<sup>rd</sup> Year & 4<sup>th</sup> Year will be set under the direction of Controller of Examinations.

Each Question Paper covering entire course consists of seven questions out of which six questions carry 10 Marks and one question carry 15 marks.

**14. Evaluation of Answer Books**

The answer books shall be got evaluated by putting fictitious roll numbers thereon or spot evaluation (Table marking) or any other method under the direction of the Controller of Examinations.

**15. Minimum Pass Marks**

During all the three annual examinations in each subject paper the candidate shall have to obtain 50% in theory including internal assessment 50% practical including internal assessment in each subject separately.

15.1 The successful candidates shall be classified into divisions as under:-

- a) Those who obtain 60% or more marks First Division.
- b) Those who obtain 50% or more marks but below 60% marks Second Division.
- c) A candidate who will obtain 75% or more marks of the total marks in any subject shall be declared to have obtained distinction in that subject provided he/she passed in all the subjects of the courses in all the parts in the first attempt.

A candidate is eligible to appear in the examination provided he/she secures a minimum of 35% marks in internal assessment in theory and practical separately.

**16. Grace Marks**

There shall be no provision for grace marks.

**17. Declaration of Result**

The results will be tabulated and declared by the Controller of Examination's office.

**18. Award of Degree**

On successfully passing the Fourth year of Bachelor of Physiotherapy examination and 6 Month's internship the students shall be awarded the degree of Bachelor of Physiotherapy Technology.

## Syllabus for First Year

### Paper – I: Anatomy

#### Theory Syllabus

#### 1. General Anatomy:

- Introduction to Anatomy, terms of position & movement
- Regions of Body, Cavities, Systems
- Connective Tissue & its modification, tendons, membranes, special connective tissue, Superficial & Deep fascia
- Bone: Structure, classification, growth, blood supply, ossification
- Muscle: Structure, classification, functional aspect
- Blood Vascular System – Arteries, capillaries, veins
- Lymphatic system
- Nervous System
- Integumentary System: Skin, Hair, Nail, Sweat & Sebaceous Glands

#### 2. General Embryology: Oogenesis, spermatogenesis, Fertilization, Formation of germ Layers

#### 3. General Histology: Epithelium, connective tissue, cartilage, bone, lymph, muscle, nerve

#### 4. Upper Limb

- Outline the anatomical features, attachments, ossification and side determination of the bones of U/L : Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges
- Fascia and Muscles of front and back of upper arm, forearm and small muscles of hands: origin, insertion, nerve supply and action.
- Nerves of upper limb course, relations and distribution.
- Detail explanation of joints of upper limb: Shoulder joint, Elbow, Wrist and joints of hand (First Carpometacarpal joint).
- Indicate the blood vessels of upper limb and mention their position course, relations, distribution and main branches.
- Regional Anatomy : Detailed explanation of the following with their applied anatomy: Pectoral Region, Scapular Region, Cubital Fossa, Axilla, Brachial Plexus, Spaces of the hand
- Surface & Radiological Anatomy

#### 5. Lower Limb

- Hip bone, femur, Tibia, Fibula, Patella, and bones of the foot
- Fascia and muscles in front of thigh, medial side of thigh, back of thigh, gluteal region front of leg, Dorsum of foot, Lateral side of leg, Muscles of back of leg and Sole of foot: Origin, Insertion, Nerve Supply, Action
- Detailed explanation of joints of Lower Leg: Pelvic Girdle, Hip joint, Knee joint, Ankle joint, joints of foot (Subtalar Joint).
- Nerves & blood vessels of Lower Leg and mention their position, course, relation, distribution and main branches
- Explain Femoral triangle, Adductor canal & Popliteal fossa
- Surface Anatomy of structures of Lower Limb

## 6. Head & Neck

- Skull, Mandible, Cervical Vertebrae
- Scalp Facial Muscles – origin, insertion, actions, nerves supply Blood Supply of Face: Arteries & Veins,
- Facial Nerve: Course, Branches & Applied Anatomy
- Temporo- mandibular Joints – structure, types of movement; Muscles of Mastication: Origin, Insertion, Nerve Supply, Actions; Diagram of relations of Lateral Pterygoid
- Posterior Triangle, Anterior Triangle
- Bony orbit, Extraocular Muscles: Origin, Insertion, Nerve Supply & Action
- Oculomotor Nerve & Ciliary Ganglion
- Note on Mandibular Nerve & Otic Ganglion
- Note on Parotid Gland, Submandibular Gland and Ganglion
- Maxillary Nerve & Sphenopalatine Ganglion
- 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, 12<sup>th</sup> Cranial Nerves
- Dural Venous Sinuses/ Cavernous Venous Sinus
- Palatine Tonsils, Thyroid Gland, Tongue
- Branches of External Carotid Artery, Maxillary Artery
- Subdivisions of pharynx, pharyngeal muscles, palatine muscles
- Larynx: Muscles & Cartilages
- Nose, Paranasal Air Sinuses
- Surface & Radiological Anatomy

## 7. Brain & Neuro Anatomy

- Gross Feature of Brain, Sulci, Gyri
- Blood Supply of Brain
- Meninges, Cisterns, CSF
- Functional Areas of Brain
- Brainstem: Gross & Applied Aspects
- Cerebellum: Gross Features, Functions, Applied Anatomy
- Basal Ganglia: Gross Features, Functions, Applied Anatomy
- White matter: Corpus Callosum, Internal Capsule
- Ventricles: Third, Fourth, Lateral
- Visual, Auditory Pathways
- Pyramidal, Extrapyramidal Tracts

## 8. Thorax

- Thoracic vertebrae, Ribs, Sternum
- Intervertebral disc and mention its parts
- Fascia and muscles of back
- Fascia and muscles connecting upper limb with vertebral column: origin, insertion, nerve supply, action.
- Intercostal muscles
- Joints of Thorax: Names and types of various joints, Manubriosternal joint, Costovertebral joint, Costotransverse joint, Costochondral joint, Chondrosternal joints, Intervertebral joint



- Respiratory movements
- Branches of Internal Thoracic artery, Arch of Aorta & Descending Thoracic Aorta
- Intercostal space and its contents
- Pleura, Lungs
- Pericardium, Heart, coronary Circulation
- Surface & Radiological Anatomy

## 9. Abdomen

- Lumbar Vertebrae, Sacrum
- Bony Pelvis; Difference between male and female pelvis
- Diaphragm: origin, insertion, nerve supply and action, structures passing through it
- Layers of anterior Abdominal wall muscles and mention its origin, insertion, nerve supply and action of these muscles.
- Rectus sheath: formation and contents
- Fascia and muscles of posterior Abdominal Wall: origin, insertion, nerve supply and action.
- Lumbar Plexus & Sacral plexus: Position, formation and branches
- Abdominal cavity –divisions/compartments
- Stomach, Duodenum, Caecum, Appendix
- Large Vessels of Gut, Portal Circulation
- Liver, Gallbladder, Pancreas, Spleen
- Intestine (small & large)
- Rectum, Anal Canal
- Gross features Kidney, Ureter, bladder, urethra
- Reproductive system of male & female (with details of prostate & supports of uterus)
- Features of pubic symphysis and sacroiliac joints.
- Urogenital diaphragm (outline only), Blood vessels of pelvis
- Surface & Radiological Anatomy

### **Anatomy Practical: Marks: 80**

1. Surface Anatomy: To study, identify and mark the surface land marks on human body.
2. To study the muscles of trunk, lower and upper extremities and face on a dissected human body.
3. To study the Bones of Human Body with special emphasis on origin and insertion of muscles and ligaments.
4. To study the anatomy of joints of upper and lower extremities and vertebral column
5. To study the anatomy of C.N.S and PNS
6. To study the gross anatomy of Respiratory, Digestive, Endocrine, Urinary and Genital system

### **Books Recommended:**

1. L. Williams & Warwick, Gray's Anatomy-Churchill Livingstone.
2. Inderbir Singh, Textbook of Anatomy with Colour Atlas–Vol. 1, 2, 3 Jaypee Brothers
3. B.D. Chaurasia, Human Anatomy–Volume 1, 2, 3 CBS Publishers & Distributors.
4. McMinn's Last's Anatomy–Regional and applied, Churchill Livingstone.
5. McMinn's et al–A Colour Atlas of Human Anatomy, Mosby.
6. Cunningham Manual of Practical Anatomy Vol. I, II, III, Churchill Livingstone.
7. Inderbir Singh, A Textbook on Human Neuro Anatomy, Jaypee Brothers.
8. Snell-Clinical Anatomy-Lippincott

## Paper – II: Physiology

### Theory Syllabus

#### Section – I

##### General Introduction:

1. **Cell Introduction:** Outline of basic concepts of cell structure, functions of components and transport across membranes
2. **Skin:** Functions, blood flow and temperature regulation.
3. **Blood and Lymph:** Cell renewal system, haemoglobin, erythrocyte granulocyte, lymphocyte, coagulation, regulation of hydrogen within concentration of body fluids, fluid distribution and exchange.

#### Section – II

##### Physiology of the systems of the body:

1. **Digestion:** Control of food and water intake and secretion and absorption movements of the alimentary canal.
2. **Circulation:** Cardio-vascular system, mechanical and electro-physiological activity of the heart, regulation of heart, coronary circulation, haemodynamics, circulation through brain, skin and skeletal muscle.
3. **Excretion:** Renal functions including formation of Urine & Micturition.
4. **Respiration:** Respiratory gases, pulmonary gas exchange, control and mechanics of breathing, hypoxia, asphyxia, dyspnoea, oxygen therapy and resuscitation.
5. **Endocrine System:** Outline of various hormones and their actions, pituitary gland, thyroid, parathyroid, adrenal glands & Gonads.
6. **General Metabolism:** Carbohydrate, Protein & Fat Metabolism.

#### Section – III

##### Neuro – Physiology

1. Neuron: Properties and functions.
2. Action Potential
3. Special properties of nerve trunks and tracts.
4. Motor units.
5. Reflex physiology
6. Synapse and synaptic transmission.
7. Supraspinal Control.
8. Cerebellum and basal ganglia.
9. Autonomic nervous system.
10. Somatic sensation.
11. Pain
12. Taste, Olfaction, Auditory and Vision.

#### Section – IV

##### Muscle Physiology:

###### Gross and Microscopic

1. Structure and function of Muscle tissue – skeletal and cardiac.
2. Chemical processes involved in muscle contraction.
3. Physiology of muscle contraction.

#### Section – V

##### Physiology of exercise and work:

1. Neuromuscular activity, human movement, physiological mechanism in movement behaviour, strength, endurance, analysis of movement.
2. Circulatory and respiratory response to exercise including effects on the heart blood

- circulation, body fluid changes, pulmonary ventilation, gas exchange and transport, etc.
3. Effects of exercise and work on other body functions.
  4. Metabolic and environmental aspects of exercise and work – metabolism, energy requirement, efficiency of muscular work, nutritional aspects, heat and body temperature regulation & environmental factors.
  5. Effects of Exercise training – endurance, fatigue and recovery.
  6. Fitness and health – age, sex, body type, race, stress and medical aspects of exercise

### **PRACTICAL Syllabus**

#### **To study the following Physiological Phenomena:**

1. Identification of blood cells and different counts.
2. W.B.C. Count.
3. R.B.C. Count.
4. Haemoglobin percentage and colour index.
5. E.S.R. and Blood groups.
6. Bleeding time and clotting time.
7. Respiratory efficiency tests.
8. Artificial respiration and C.P.R.
9. Pulse rate, Heart rate and measurement of Blood Pressure.
10. Respiratory rate and Auscultation.
11. Normal E.C.G.
12. Reflexes – Superficial Deep.
13. Sensations.
14. Tests for functions of Cerebrum and Cerebellum

#### **Books Recommended:**

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

## Paper –III: Biochemistry

### Theory Syllabus

#### Section – I

1. **Biophysics:** Concepts of pH and buffers, acid base equilibrium osmotic pressure and its physiological applications.
2. **Cell:** Morphology, structure & kinetics of cell, cell membrane, Nucleus, chromatin, Mitochondria, Endoplasmic Reticulum, Ribosomes.
3. **Water and Electrolyte:** Fluid compartment, daily intake and output sodium and potassium metabolism.
4. **Connective Tissue:** Mucopolysaccharide connective tissue proteins, glycoproteins, chemistry & Metabolism of bone and tooth, metabolism of skin.
5. **Nerve Tissue:** Composition, metabolism, chemical mediators of Nerve activity.
6. **Isotopes:** Isotopes and their role in treatment and diagnosis of diseases.

#### Section – II

1. **Carbohydrates:** Definition, functions, sources, classifications, Monosaccharides, Disaccharides, Polysaccharides, mucopolysaccharide and its importance.
2. **Lipids :** Definition, function, sources, classification, simple lipid, compound lipid, derived lipid, unsaturated and saturated fatty acid, Essential fatty acids and their importance, Blood lipids and their implications, cholesterol and its importance.
3. **Proteins:** Definition, sources, kinetics, classification, simple protein conjugated protein, derived proteins, properties and varieties of proteins.
4. **Nucleic Acid:** Structure and function of DNA and RNA, Nucleosides, nucleotides, Genetic code, Biologically important nucleotides.
5. **Enzymes:** Definitions, classification, mode of action, factor affecting enzyme action, clinical importance of enzyme.
6. **Vitamins:** Classification, fat soluble vitamins, A, D, E & K, water soluble vit. B complex & C, Daily Requirements, Physiological functions and diseases of Vitamin deficiency.
7. **Nutrition:** Balance, diet, metabolism in exercise and injury, Diet for chronically ill and terminally ill patients.
8. **Hormones:** General characteristics and mechanism of Hormone action insulin, glucagone Thyroid and Parathyroid hormones, cortical & sex hormones.

#### Section – III

1. **Bioenergetics:** Concept of free energy change, Exogenic and endogenic reactions, concepts regarding energy rich compounds, Respiratory chain and Biological oxidation.
2. **Carbohydrate Metabolism:** Glycolysis, HMP shunt pathway, TCA cycle, glycogenesis, glycogenolysis, Glucogenesis, Maintenance of Blood Glucose, interconversions of different sugar.
3. **Lipid Metabolism:** Fatty acid oxidation, Fatty acid synthesis, Metabolism of cholesterol, Ketone bodies, Atherosclerosis and obesity.
4. **Protein Metabolism:** Transamination, Transmethylation, Deamination, Fate of ammonia, urea synthesis and synthesis of creatine, inborn errors of metabolism.

#### **Books Recommended:**

1. Text book of Biochemistry - Chatterjee M.N.– Jaypee Brothers.
2. Text book of Biochemistry for Medical Students - Vasudevan D.M. - Jaypee Brothers.
3. Clinical Biochemistry – Metabolic & Clinical aspects - Marshall & Bangert – Churchill Livingstone.
4. Biochemistry Southerland – Churchill Livingstone.

## **Paper – IV: Exercise Therapy – I**

### **Theory Syllabus**

#### **Section – I**

Introduction to Exercise therapy, Principles, techniques and general areas of its application, Assessment & its importance.

Description 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 Neuro – muscular co – ordination.

Classification of movements – Describe the types, technique of application, indications, contraindications, effects and uses of the following:

- a) Active movement
- b) Passive movement
- c) Active assisted movement
- c) Resisted movement
- e) To study the principles, techniques of application indication, Contraindication, precaution, effects and uses of Suspension Therapy.

#### **Section – II**

##### **Manual Muscle Testing**

- a) Principles and application techniques of Manual muscle testing.
- b) Testing position, procedure and grading of muscles of the upper limb, lower limb and trunk etc.

#### **Section – III**

##### **Goniometry**

##### **Goniometers and its types:**

- a) Principles, techniques and application of Goniometry.
- b) Testing position, procedure and measurement of R.O.M. of the joints of upper limbs, lower limbs and trunk.

#### **Section – IV**

##### **Soft Tissue Manipulation (Therapeutic Massage)**

- a) History, various types of soft tissue manipulation techniques.
- b) Physiological effects of soft tissue manipulation on the following systems of the body; Circulatory, Nervous, Musculoskeletal, Excretory, Respiratory, Integumentary system and Metabolism.
- c) Classify, define and describe: - effleurage, stroking, kneading, petrissage, deep friction, vibration and shaking etc.
- d) Preparation of patient: Effects, uses, indications and contraindications of the above manipulation.

#### **Section – V**

##### **Motor Learning**

- i) **Introduction to motor learning**
  - a) Classification of motor skills.
  - b) Measurement of motor performance.
- ii) **Introduction to motor control**
  - a) Theories of motor control.
  - b) Applications.
- iii) **Learning Environment**
  - a) Learning of Skill.
  - b) Instruction & augmented feedback.

c) Practice conditions.

## **Section – VI** **Relaxation & Therapeutic Gymnasium**

### **Relaxation**

1. Describe relaxation, muscle fatigue, muscle spasm and tension (mental & physical).
2. Factors contributing to fatigue & tension.
3. Techniques of relaxation (local and general).
4. Effects, uses & clinical application.
5. Indication & contraindication.

### **Therapeutic Gymnasium**

- i) Setup of a gymnasium & its importance.
- ii) Various equipment in the gymnasium.
- iii) Operational skills, effects & uses of each equipment.

### **Practical Syllabus**

- 1) To practice all soft tissue manipulative techniques region wise – upper limb, lower limb, neck, back and face.
- 2) To practice the measurement of ROM of joints – upper limb, lower limb & trunk.
- 3) To practice the grading of muscle strength region wise – upper limb, lower limb and trunk.
- 4) To study the position of joints, muscle work, and stability of various fundamental and derived positions.
- 5) To study the different types of muscle contraction, muscle work, group action of muscles and co-ordinated movements.
- 6) To practice the various types of suspension therapy and its application on various parts of body – region wise.
- 7) To study & practice local & general relaxation techniques.
- 8) To study the structure & function alongwith application of various equipment in a gymnasium.

### **Books Recommended:**

1. Practical Exercise Therapy - Hollis - Blackwell Scientific Publications.
2. Therapeutic Exercises - Basmajian - Williams and Wilkins.
3. Therapeutic Exercises Foundations and Techniques - Kisner and Colby -F.A. Davis.
4. Proprioceptive Neuromuscular Facilitation - Voss et al - Williams and Wilkins.
5. Principle of Exercise Therapy -Gardiner - C.B.S. Delhi.
6. Beard's Massage - Wood – W. B. Saunders.
7. Motor Control: Theory and Practical Applications Shumway - Cook & Wallcott - Lippincott.
8. Hydrotherapy, Principles and Practices - Champion - Butterworth Heinmann.
9. Muscle testing and functions - Kendall - Williams & Wilkins.
10. Daniels and Worthingham's - Muscle Testing - Hislop & Montgomery - W.B. Saunders.
11. Measurement of Joint Motion: A Guide to Goniometry - Norkins & White - F.A. Davis.
12. Introduction to Exercise therapy for beginners-Balwinder Singh –Chetna Parkashan Publishers

## **Paper – V: Electrotherapy – I**

### **Theory Syllabus**

#### **Section – I**

##### **Physical Principles:**

Structure and properties of matter – solids, liquids and gases, adhesion, surface tension, viscosity, density and elasticity.

Structure of atom, molecules, elements and compounds.

Electron theory, static and current electricity.

Conductors, Insulators, Potential difference, Resistance & Intensity.

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

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

##### **Effects of Current Electricity:**

1. Chemical effects – Ions and Electrolytes, Ionisation, Production of a E.M.F. by chemical actions.
2. Magnetic effects, Molecular Theory of Magnetism, Magnetic fields, Electromagnetic Induction.
3. Milli ammeter and Voltmeter, Transformers and Choke Coil.  
Thermal Effects – Joule's Law and Heat production.
4. Physical Principles of Sound and its Properties.
5. Physical Principles of Light and its Properties.
6. Electromagnetic Spectrum – Biophysical Application.

#### **Section – II**

##### **1. Electrical supply:**

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

#### **Section – III**

##### **Low Frequency Currents:**

1. Introduction to Direct, Alternating & Modified Currents.
2. Production of direct current – Physiological and Therapeutic Effects of Constant Current, Anodal and Cathodal Galvanism, Ionisation and Their Application in Various Conditions.
3. Iontophoresis – Principles of Clinical Application, Indication, Contraindication, Precaution, Operational Skills of Equipment & Patient Preparation.
4. Modified Direct Current – various pulses, duration and frequency and their effect on Nerve and Muscle tissue. Production of interrupted and surged current & their effects.
5. Modified Direct Current – Physiological and therapeutic effects, principles of clinical application, indications, contra indications, precautions, operational skills of equipment & patient preparation.
6. **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.

#### **Section – IV**

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

Electrical Stimuli and normal behaviour 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 & pulse ratio.

#### **Section – V**

1. 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.
2. **Ultra – Violet 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.

#### **Section – VI**

**Superficial heat** - Paraffin wax bath, moist heat, electrical heating pads.

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

##### **Practical Syllabus**

1. To study the basic operation of electric supply to the equipment & safety devices.
2. To experience sensory and motor stimulation of nerves and muscles by various types of low frequency currents on self.
3. To locate and stimulate different motor points region wise, including the upper & lower limb, trunk free.
4. Therapeutic application of different low frequency currents Faradic foot bath, Faradism under pressure, Ionotophoresis.
5. To study the reactions of degeneration of nerves, to plot strength duration curves.
6. To find chronaxie and Rheobase.
7. To study a hydrocollator unit, its operations and therapeutic application of Hot packs – region wise.
8. To study the various types of Infrared lamps and their application to body region wise.
9. To study a paraffin wax bath unit, its operation and different methods of application – region wise.
10. To study the different types of Ultra violet units, their operation, assessment of test dose and application of U.V.R. – region wise.
11. To study a TENS Stimulator, its operation and application – region wise.

##### **Books Recommended:**

1. Electrotherapy Explained: Principles & Practice – Low & Reed – Butterworth Heinemann.
2. Clayton's Electrotherapy, (9<sup>th</sup> Ed.) Forster & Palastanga Bailliere Tindall.
3. Therapeutic Heat and Cold – Lehmann – Williams & Wilkins.
4. Principles and Practice of Electrotherapy – Kahn – Churchill Livingstone.



## Paper – VI: Sociology & Community Health

### Theory Syllabus

1. **Introduction:** Definitions of sociology, sociology as a science of society, uses of the study of sociology, application of knowledge of sociology in physiotherapy and occupational therapy.
  2. **Sociology & Health:** Social factors affecting health status, social consciousness and perception of illness, social consciousness and meaning of illness, decision making in taking treatment. Institutions of health, their role in the improvement of the health of the people.
  3. **Socialization:** Meaning of socialization, influence of social factor on personality, socialization in hospitals, socialization in the rehabilitation of patients.
  4. **Social Groups:** Concept of social groups, influence of formal and informal groups on health and sickness, the role of primary groups and secondary groups in the hospitals and rehabilitation settings.
  5. **Family:** Influence of family on human personality, discussion of changes in the functions of a family, influence of family on the individual's health, family and nutrition, the effects of sickness on family, and psychosomatic disease.
  6. **Community:** Concept of community, role of rural and urban communities in public health, role of community in determining beliefs, practices and home remedies in treatment.
  7. **Culture:** Components of culture. Impace of culture on human behavior, cultural meaning of sickness, response & choice of treatment (role of culture as social consciousness in moulding the perception of reality), culture induced symptoms and disease, sub – culture of medical workers.
  8. **Caste System:** Features of modern caste system and its trends.
  9. **Social Change:** Meaning of social change, factors of social change, human adaption and social change, social change and stress, social change and deviance, social change and health programmes, the role of social planning in the improvement of health and in rehabilitation.
  10. **Social Control:** Meaning of social control, role of norms, folkways, customs, morals, religion, law and other means of social control in the regulation of human behavior, social deviance and disease
  11. **Social Problems of the 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
  12. **Social Security:** Social security and social legislation in relation to the disabled.
  13. **Social Worker:** The role of medical social worker.
- Community Health:**
1. Introduction to Community Health, community and rehabilitation.
  2. Community based rehabilitation in relation to different medical and surgical conditions e.g. Cholera, Typhoid, Diptheria, Leprosy, Poliomyelitis, HIV & AIDS, Hepatitis etc. Prevention of diseases at different levels.
  3. Community based rehabilitation vs. institutional based rehabilitation – comparison and different aspects. Community resources and their uses.

**Books Recommended:**

1. Mcgee - Sociology - Drydon Press Illinois.
2. Kupuswamy - Social Changes in India - Vikas, Delhi.
3. Ahuja - Social Problems - Bookhive, Delhi.
4. Ginnsberg - Principles of Sociology - Sterling Publications.
5. Parter & Alder - Psychology & Sociology Applied to Medicine - W.B. Saunders.
6. Julian - Social Problems - Prentice Hall.

**Syllabus for Second Year****Paper – I: Pathology & Microbiology****Theory Syllabus****Section – I****Pathology (Part 1) General Pathology**

1. Aims and objectives of the study of pathology. Meaning of terms, etiology, pathogenesis and lesions.
2. Causes of disease .cell injury – causes of cell injury features of cell injury mechanism of cell injury – hypoxia, free radical injury. Necrosis and gangrene
3. Inflammation–definition, events of acute inflammation, chemical mediator of inflammation, morphological types of acute inflammation ,chronic inflammation, difference between acute and chronic inflammation
4. REPAIR–primary healing, secondary healing, factors affecting healing and repair healing of skin, muscle and bone.
5. Fluid and hemodynamic derangements–oedema, hyperemia, Haemorrhage, 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 (details not required).

**Part 2**

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, platelets
2. Blood Vessels: atherosclerosis, thromboangitis obliterance, vericose 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, Bronchiactesis, Emphysema, Chronic bronchitis, Asthma, Tuberculosis.

5. Joints disorders: Arthritis- types and their features.
6. Bone Disorders: osteoporosis, pagets disease, osteogenesis imperfecta, osteomyelitis, tumors–osteosarcoma, chonrosarcoma, ewings sarcoma, multiple myloma (a brief outline)
7. Muscles: muscular dystrophy, mysthenia gravis.
8. Nervous System: meningitis, encephalitis, vascular diseases of brain, poliomyelitis, nerve injuries

### **Section – II Part–I Microbiology**

1. An introduction to microbiology, Classification of microorganisms,
2. Infection – types, source, portals of entry, spread.
3. Prevention and control of infection, Disinfection and antiseptics Sterilization

### **Part–II**

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, Ameobiasis Kalaazar, Malaria, Filaria.

### **Books Recommended:**

1. Robbins Pathological Basis of Disease - Cotran, Kumar & Robbins - W.B. Saunders.
2. General Pathology - Walter & Israel - Churchill Livingstone.
3. Muirs Textbook of Pathology - Anderson - Edward Arnold Ltd.
4. Text book of Pathology - Harsh Mohan - Jaypee Brothers.
5. Pathology: Implications for Physical Therapists - Goodmann and Boissonnault - W.B. Saunders.
6. Essential of Medical Microbiology - Bhatia & Lal - Jaypee Brothers.
7. Medical Microbiology - Mims - Jaypee Brothers.
8. Microbiology: An Introduction for the Health Sciences – Ackerman and Richards - W.B. Saunders Co.

## **Paper II: Pharmacology**

### **Theory Syllabus**

#### **Section – I**

1. General action of drugs.
2. Drug allergy and idiosyncrasy.
3. Drug toxicity
4. Metabolic fate of drug
5. Methods of administration
6. Chemical character of drugs
7. Drugs acting on respiratory system
8. Vitamins

#### **Section – II**

1. Drugs acting on Central nervous system – anaesthetics, alcohols, alkaloids, narcotics, antipyretics, hypnotics, sedatives, anticonvulsants, stimulants, psychotherapeutics.
2. Drugs acting on peripheral nervous system – stimulating and inhibiting cholinergic and anticholinergic activity.
3. Drugs acting on Neuromuscular junction and muscles
4. Drugs for pain management.

#### **Section – III**

1. Hormones and drugs affecting endocrine functions
2. Drugs acting on cardiovascular system
3. Chemotherapeutic agents

#### **Books Recommended:**

1. Pharmacology and Pharmacotherapeutics - R.S. Satoskar – Popular Publications, Bombay.
2. The Pharmacologic Principles of Medical Practice - Krantg & Jelleff - Calcutta Scientific Book Agency.
3. Pharmacology - Praseem K. Das. – Churchill Livingstone
4. Essential of Medical Pharmacology - K.D. Tripathi - Jaypee Brothers.

## **Paper – III: Exercise Therapy – II**

### **Theory Syllabus**

#### **Section – I**

##### **Therapeutic Exercises**

1. Principle, classification, techniques, physiological & therapeutic effects, indications & contraindications of therapeutic exercises.
2. Assessment & evaluation of a patient (region wise) to plan a therapeutic exercise program.
3. Joint Mobility – Etiogenesis of Joint stiffness, general techniques of mobilization, effects, indications, contraindications & precautions.
4. Muscle Insufficiency – Etiogenesis of muscle insufficiency (strength, tone, power, endurance & volume), general techniques of strengthening, effects, indication, contraindications & precautions.
5. Neuromuscular Inco-ordination – Review normal neuromuscular coordination, Etiogenesis of neuromuscular in co-ordination & general therapeutic techniques, effects, indications, contraindications & precautions.
6. Functional re-education – General therapeutic techniques to re-educate ADL function.

#### **Section – II**

##### **Posture, Balance, Gait:**

Normal Posture – Overview of the mechanism of normal posture.

Abnormal Posture – Assessment, Types, etiogenesis, management, including therapeutic exercises.

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.

#### **Section – III**

##### **Hydrotherapy:**

1. Basic principles of fluid mechanics, as they relate to hydrotherapy.
2. Physiological & therapeutic effects of hydrotherapy, including joint mobility muscle Strengthening & wound care etc.
3. Types of Hydrotherapy equipment, indications, contraindications, operation skills & patient preparation.

#### **Section – IV**

##### **Special Techniques:**

1. Introduction to special mobilization & manipulation techniques, effects, indications & contraindications.
2. Conceptual framework, principle of proprioceptive neuromuscular facilitation (PNF) techniques, including indications, therapeutic effects and precautions.
3. Principles of traction, physiological & therapeutic effects classification, types, indications, contraindications, techniques of application, operational skills & precautions.
4. Review normal breathing mechanism, types, techniques, indications, contraindications, therapeutic effects & precautions of breathing exercises.
5. Group Theory – Types, advantages & disadvantages.
6. Exercises for the normal person – Importance and effects of exercise to maintain optimal

health & its role in the prevention of diseases. Types, advantages, disadvantages, indications, contraindications & precautions for all age groups.

7. Introduction to Yoga – Conceptual framework, various “asanas”, the body – mind relationship, effects & precautions.
8. Role of muscle energy technique.

### **Practical Syllabus**

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

1. To study & practice the various techniques of mobilization of joints region wise.
2. To study & practice the various techniques of progressive strengthening exercises of muscles region wise.
3. To study & practice the use of various ambulation aids in gait training.
4. To assess & evaluate ADL's and practice various training techniques.
5. To study & practice mat exercises.
6. To assess & evaluate normal & abnormal posture & practice various corrective techniques.
7. To assess & evaluate equilibrium / balance & practice various techniques to improve balance.
8. To study the structure & functions of hydrotherapy equipments & their applications.
9. To study & practice various traction techniques, including manual, mechanical & electrical procedures.
10. To study & practice various group exercise therapies.
11. To practice & experience effects of basic yoga “asanas”.
12. To study, plan & practice exercise programmes for normal persons of various age groups.

### **Books Recommended:**

- 1) Practical Exercise Therapy - Hollis - Blackwell Scientific Publications.
- 2) Therapeutic Exercises - Basmajian - Williams & Wilkins.
- 3) Therapeutic Exercises Foundations and Techniques - Kisner & Colby -F.A. Davis.
- 4) Proprioceptive Neuromuscular Facilitation - Voss et al - Williams and Wilkins.
- 5) Principle of Exercise Therapy - Gardiner - C.B.S. Delhi.
- 6) Orthopaedic Physical Therapy - Woods - Churchill Livingstone.
- 7) Manipulation ad Mobilisation Extremities and Spinal Techniques - Edmond - Mosby.
- 8) Aquatic Exercise Therapy - Bates and Hanson-W.B. Saunders.
- 9) Manual Examination and Treatment of Spine and Extremities - Wadsworth - Lippincott.
- 10) Hydrotherapy: Principles and Practices - Campion - Butterworth Heinmann.

## Paper – IV: Electrotherapy – II

### Theory Syllabus

#### SECTION – I

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.

#### SECTION – II

1. **High frequency currents (S.W.D. and M.W.D.)** – Production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.
2. **(a) Medium frequency currents (Interferential Therapy)** – Conceptual framework of medium frequency current therapy, production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.  
**(b) Di-Dynamic Currents, Russian Current** – Production, types, therapeutic uses and contraindications of Russian currents and dynamic currents.
3. **High frequency sound waves (Ultrasound)** – Production, biophysical effects, types, therapeutic effects, techniques of application, indications, contraindications, precautions, operational skills and patient preparation.

#### SECTION – III

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 cold (Cryotherapy)** – Sources, biophysical effects, types, therapeutic effects, indications, contraindications, precautions, application techniques and patient preparation.
3. **Therapeutic mechanical pressure (Intermittent compression therapy)** – Principle, biophysical effects, types, therapeutic effects, indications, contraindications, precautions, operational skills and patient preparation.

#### SECTION – IV

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

### Practical Syllabus

1. To study a short wave diathermy unit, its operation and different methods of application – region wise.
2. To study a Micro wave diathermy unit, its operation unit, its operation and different methods of application – region wise.
3. To study an Ultrasound unit, its operation and different methods of application – region wise.
4. To study a Laser unit, its operation and different methods of application – region wise.
5. To study various forms of therapeutic cold application region wise including – ice, cold packs, vapour coolant sprays, etc.
6. To study a Intermittent therapy unit, its operation and different methods of application – region wise.

7. To study a Interferential pneumatic therapy unit, its operation and different methods of application – region wise.
8. To observe various Electro – myography (EMG) procedures.
9. To observe various Electro – neurography (ENG) procedures.
10. To study a Bio feedback unit, its operation and different methods of application – region wise.

**Books Recommended:**

1. Electrotherapy Explained: Principles & Practice Low & Reed – Butterworth Heinmann.
2. Clayton’s Electrotherapy (10th edition) – Kitchen & Bazin – W.B. Saunders..
3. Therapeutic Heat and Cold Lehmann – Williams & Wilkins.
4. Principles and Practice of Electrotherapy – Kahn – Churchill Livingstone.
5. Electrotherapy: Clinics in Physical Therapy – Wolf – Churchill Livingstone.



**Paper – V: Biomechanics**  
**Theory Syllabus**

**Section – I**  
**Mechanics**

- a) Introduction to mechanics including motion, forces, parallel forces system
- b) Newton's law of motion, concurrent force systems – composition forces, muscle action line etc.
- c) Centre of Gravity, line of gravity, stability and equilibrium.
- d) Introduction to Bio-Mechanics and terminology.

**Section – II**  
**Joint Structure and Function:**

- a) Basic principles of Joint design and a human joint.
- b) Tissues present in human joint including fibrous tissue, bone cartilage and connective tissue.
- c) Classification of joints.
- d) Joint function, Kinematics chains and range of motion.
- e) Recall anatomy and study the biomechanics of the spine, shoulder girdle, joints of the upper extremity, pelvic girdle and the joints of the lower extremity.

**Section – III**  
**Muscle Structure and function:**

- a) Mobility and stability functions of muscle.
- b) Elements of muscle structure and its properties.
- c) Types of muscle contractions and muscle work.
- d) Classification of muscles and their functions.
- e) Group action of muscles, Co-ordinated movement.

**Section – IV**  
**Posture & Gait:**

- a) Posture – Definition, factors responsible for posture, relationship of gravity on posture.
- b) Postural imbalance – factors responsible for imbalance in Static and dynamic positions including ergonomics.
- c) Description of Normal gait, determinants of gait, spatio temporal features and analysis.
- d) Gait deviations – Types, Causative factors and analysis.

**Practical Syllabus**

- 1. To study the effects of forces on objects.
- 2. To find out the C.G. of an object.
- 3. To identify axis and planes of motion at the joints of spine, shoulder girdle, joints of upper extremity, Pelvic girdle and joints of lower extremity.
- 4. To study the different types of muscle contraction, muscle work, group action of muscles of co - ordinated movements.
- 5. Analysis of Normal posture respect to L.O.G. and the optimal position of joints in Antero - posterior and lateral views.
- 6. Analysis of normal gait and measurement of spatio temporal features.

**Books Recommended:**

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

**Paper – VI: Psychology  
Theory Syllabus**

**Section – I  
General Psychology**

1. **Definition of Psychology:** Definition of psychology, information in relation to following schools methods and branches.
  - a. **Schools:** Structuralism, functionalism, behaviourism psychoanalysis, gestalt psychology.
  - b. **Methods:** Introspection, observation, inventory and experimental method.
  - c. **Branches:** General, child, social, abnormal, industrial, clinical, counseling, educational.
2. **Heredity and Environment:** Twins, Relative importance of heredity and environment, their role in relation to physical characteristics, intelligence and personality, nature – nature controversy.
3. **Development and Growth Behavior:** Infancy, childhood, adolescence, adulthood, middle age, old age.
4. **Intelligence:** Definitions, IQ, Mental Age, List of various intelligence tests – WAIS, WISC, Bhatia’s performance test, Raven’s Progressive Matrices test.
5. **Motivation:** Definitions: Motive, drive, incentive and reinforcement, Basic information about primary needs: hunger thirst, sleep, elimination activity, air, avoidance of pain, attitude to sex.  
**Psychological Needs:** Information, security, self-esteem, competence, love and hope.
6. **Emotions:** Definitions: Differentiate from feelings, psychological changes of emotion, Role of RAS, hypothalamus, cerebral cortex, sympathetic nervous system, adrenal gland, heredity and emotion, Nature and control of anger, fear and anxiety.
7. **Personality:**
  - a) **Definitions:** List of components: Physical characteristics, character, abilities, temperament, interest and attitudes.
  - b) Discuss briefly the role of heredity, nervous system, physical characteristics, abilities, family and culture of personality development.
  - c) **Basic concepts of Freud:** unconscious, conscious, Id, ego and superego, List and define the oral, anal and phallic stages of personality development list and define the 8 stages as proposed by Erickson, 4 concepts of learning as proposed by Dollard and Miller; drive, cue, response and reinforcement.  
**Personality assessment:** interview, standardized, non-standardized. Exhaustive, and stress interviews, list and define inventories BAI, CPI and MMPI, projective test: Rorschach, TAT and sentence completion test.
8. **Learning:** Definition: List the laws of learning as proposed by Thorndike. Types of learning: Briefly describe, classical conditions, operant conditioning, insight, observation and Trial and Error type list the effective ways to learn: Massed Vs. Spaced, Whole Vs. Part, Recitation Vs. Reading, Serial Vs. Free Recall, knowledge of results, Association Organization, Mnemonic methods, incidental Vs. Intentional learning, role of language.
9. **Thinking:** Definition, concepts, creativity, steps in creative thinking, list the traits of creative people, delusions.

**10. Frustration:** Definition, sources, solution, Conflict; Approach – approach, Avoidance – avoidance, and approach – avoidance solution.

**11. Sensation, Attention and Perception**

- a) List of Senses: Vision, Hearing, Olfactory, Gustatory and cutaneous sensation, movement, equilibrium and visceral sense. Define attention and list factors that determine attention: nature of stimulus intensity, colour, change, extensity, repetition, movement size, curiosity, primary motives.
- b) Define perception and list the principles of perception: Figure ground, constancy, similarity, proximity, closure, continuity values and interests, past experience context, needs, moods, religion, sex and age, perceived susceptibility perceived seriousness, perceived benefits and socioeconomic status.
- c) Define illusion and hallucination.
- d) List visual, auditory, cutaneous, gustatory and olfactory hallucination.

**12. Democratic and Authoritarian Leadership:** Qualities of leadership: Physical factors, intelligence, self-confidence, sociability, will and dominance. Define attitude. Change of attitude by: Additional information, changes in-group – affiliation, enforced modification by law and procedures that affect personality. (Psychotherapy, Counseling and religious conversion).

**13. Defence Mechanisms of the Ego:** Denial, rationalization, projection, reaction formation, identification, repression, emotional insulation, undoing, interjection, acting out depersonalization.

**Section – II**

**Health Psychology**

1. **Psychological Reactions of a Patient:** Psychological reactions of a patient during admission and treatment anxiety, shock, denial, suspicion, questioning, loneliness, regression, shame, guilt, rejection, fear, withdrawal, depression, egocentricity, concern about small matters, narrowed interests, emotional over reactions, perpetual changes, confusion, disorientation, hallucinations, delusions, illusions, anger, hostility, loss of hope.
2. **Reactions to Loss:** Reactions to loss, death and bereavement shock and disbelief, development of awareness, restitution, resolution. Stages of acceptance as proposed by Kubler – Ross.
3. **Stress:** Physiological and Psychological relation to health and sickness: psychosomatic, professional stress burnout.
4. **Communications:**
  - a) Types verbal, non-verbal, elements in communication, barriers to good communication, developing effective communication, specific communication techniques.
  - b) Counseling: Definition, Aim, differentiate from guidance, principles in counseling and personality qualities of counseleors.
5. **Compliance:** Nature, factors, contributing to non – compliance, improving compliance.
6. **Emotional Needs:** Emotional needs and psychological factors in relation to unconscious patients, handicapped patients, bed – ridden patients, chronic pain, spinal cord injury, paralysis, cerebral palsy, burns, amputations, disfigurement, head injury, degenerative disorders, parkinsonism, leprosy, incontinence and mental illness.
7. **Geriatric Psychology:** Specific psychological reactions and needs of geriatric patients.
8. **Pediatric Psychology:** Specific psychological reactions and needs of pediatric patients.
9. **Behavior Modifications:** Application of various conditioning and learning principles to modify patient behaviours.
10. **Substance Abuse:** Psychological aspects of substance abuse: smoking, alcoholism and drug

addiction.

11. **Personality Styles:** Different personality styles of patients.

**Books Recommended:**

1. Introduction to Psychology - Mums - I.D.P. Co.
2. Foundation of Psychology - Weld - Publishing House, Bombay.
3. Introduction to Social Psychology – Akolkar – Oxford Publishing House.
4. Psychology and Sociology – Applied to Medicine – Porter & Alder - W.B. Saunders.
5. Behaviourial Sciences for Medical Undergraduates – Manju Mehta - Jaypee Brothers.

## Syllabus for Third Year

### Paper I: Orthopaedics

#### Theory Syllabus

#### Section – I

1. **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.
2. **Principles of Operative Treatment:** List indications, contraindication and briefly outline principles of: Athrodesis, Arthroplasty, Osteotomy, Bonegrafting, Tendon – Transfers and Arthroscopy.
3. **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, Dequervan's disease, tenovaginitis, trigger finger, carpal tunnel syndrome and plantar fasciitis.
4. **Sports Injuries:** Injuries related to common sports their classification and management.

#### Section – II

1. **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 complication including: Fracture – disease, Volkmann's ischaemic contracture, Sudeck's Atrophy, Carpal Tunnel Syndrome. Myositis ossificans and shoulder – hand syndrome.
  - vi) Fracture healing.
2. **Upper Limb Fractures & Dislocations:**
  - a) Enumerate major long bone fractures and joint injuries.
  - b) Briefly describe their clinical features, principles of management and complications.
3. **Lower Limb Fractures & Dislocations:**
  - a) Enumerate major long bone fractures and joint injuries.
  - b) Briefly describe their clinical features, principles of management and complication.
4. **Spinal Fractures and Dislocations:** Outline the mechanism, clinical features, principles of management and complications of spinal injuries.
5. **Recurrent Dislocations:** Outline the mechanism, clinical features, principles of management and complications of recurrent dislocation of the shoulder and patella.

#### Section – III

1. **Amputations:**
  - a) Classify amputations. List indication for surgery,
  - b) Outline pre-operative, operative and prosthetic management.
  - c) Outline prevention and treatment of complications.
2. **Bone & Joint Infections:** Outline the etiology, clinical features, management and complications of septic arthritis osteomyelitis, Tuberculosis (including spinal T.B.).

3. **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).

#### **Section – IV**

1. **Chronic Arthritis:** Outline of pathology: clinical features, mechanism of deformities, management and complications of Rheumatoid arthritis. Osteoarthritis of major joints and spine, Ankylosing spondylitis.
2. Neck & Back Pain, Painful Arc Syndrome, Tendonitis, Facitis & Spasmodic Torticollis. Outline the above including clinical features and management.
3. **Spinal Deformities:** Classify spinal deformities and outline the salient clinical features, management and complications of Scoliosis, Kyphosis and Lordosis.

#### **Section – V**

1. **Poliomyelitis:** Describe the pathology, microbiology, prevention, management and complications of polio. Outline the treatment of residual paralysis including use of orthoses. Principles of muscle transfers and corrective surgery.
2. **Congenital Deformities:** Outline the clinical features and management of CTEV, CDH, Flat foot, vertical talus, limb deficiency (radial club hand and femoral, tibial and fibula deficiencies meningomyelocoele, Arthrogryphosis multiplex congenitiae and Osteogenesis imperfecta.
3. **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.**Hand Injuries:** Outline of clinical features, management and complications of : Skin and soft tissue injury, tendon injury, bone and joint injury.
4. **Leprosy:** Outline of clinical features, management and complications of neuritis, muscle paralysis, tropic ulceration and hand & feet deformities.

#### **Practical Syllabus**

1. History Taking
2. Clinical Assessment & Evolution of Patients with Orthopedic conditions mentioned in Theory Syllabus

#### **Books Recommended:**

1. Watson – Zones, Fractures and Joint Injuries – Wilson – Churchill Livingstone.
2. Clinical Orthopaedic Examination – Mcrae – Churchill Livingstone.
3. Concise System of Orthopaedics and Fractures – Apley – Butterworth Heinmann.
4. Outline of Fractures – Adam – Churchill Livingstone.
5. Outline of Orthopaedics – Adam – Churchill Livingstone.
6. Physical Examination in Orthopaedics – Apley – Butterworth Heinmann.
7. Clinical Orthopaedics Diagnosis – Pandey & Pandey – Jaypee Brothers.

## Paper – II: General Medicine

### Theory Syllabus

#### Section – I

1. Introduction to modes of transfer of communicable diseases & general preventive measures.
2. **Bacterial Diseases:** Tuberculosis, Leprosy, Rheumatic fever, Tetanus, Typhoid fever, Diphtheria, Pneumonia, Bacillary Dysentery and Measles.
3. **Viral Diseases:** Herpes – simplex and zoster, Varicella, Measles, Mumps, Hepatitis B & C, AIDS & influenza.
4. **Metabolic and Deficiency Diseases:** Diabetes, Anemia, Vitamin & Nutritional Deficiency diseases, diseases of the endocrine glands.

#### Section – II

1. **Diseases of Respiratory System:** Asthma, Bronchitis, Massive collapse of lungs, Bronchiectasis Bronchial Pneumonia, lung abscess, Emphysema, Empyema, Paralysis of diaphragm & vocal cords, chronic infection of larynx and trachea, Abnormalities of trachea, infract of lungs, chronic passive congestion, chronic obstructive pulmonary disease, chest wall deformities.
2. **Diseases of Circulatory System:** Thromobsis, Embolism, Gangrene, Valvular diseases, Hemorrhage, Heart Malformation, various diseases of arteries, diseases of blood forming organs, Anemia, Leukaemia, Leucocytosis, Peripheral Vascular diseases, diseases of the lymphatic systems. Diseases of the heart – Hypertension, Hypotension, Aortic aneurysm, Endocarditis, Pericarditis, Aortic Regurgitation, Cardiac failure, coronary heart diseases, congenital heart malformation and its manifestation.

#### Section – III

1. **Diseases of Digestive Systems:** Pharyngitis, spasm of the Oesophagus, Diverticulum stenosis, Gastric ulcer, Hemetemesis, Pyloric stenosis, Dyspepsia, Vomiting, Diarrhoea, Duodenal ulcer etc.
2. **Disease of Liver:** Jaundice Cirrhosis of liver, Abscess of liver, Ascitis.
3. **Diseases of Kidney:** Polyuria, Hematuria, Uremia, Anuria, Nephritis, Urinary infections, Urinary calculi.

#### Section – IV

##### Diseases of Skin:

1. Characteristics of normal skin, abnormal changes, types of skin lesions.
2. **Conditions** – Leprosy, Acne, Boil, Carbuncles, Impetigo, Infections of skin, Herpes, Urticaria, Psoriasis, Skin disorders associated with circulatory disturbances, Warts, Corn, Defects in Pigmentation, Psoriasis, Leucoderma, Fungal infections, Alopecia, Dermatitis, Eczema, Skin – allergies, Venereal diseases.

#### Section – V

##### Psychiatry:

1. Introduction: Definition, defence mechanism, symptomatology, types & causes of mental disorders, psychosomatic disorders.
2. **Disorders:**
  - a) Psychosis – Schizophrenia (including paranoid), maniac depressive psychosis, involvement psychosis.
  - b) Psychoneurosis – Anxiety, hysteria, anxiety states, neurasthesis, reactive depression, obsessive compulsive neurosis.
  - c) Organic reaction to – toxins, trauma & infection.
  - d) Senile dementia.
3. **Mental retardation** – Definition, causes manifestation and management.
4. **Therapies:**
  - a) Psychotherapy – Group therapy, Psychodrama, behaviour modification, family therapy, play therapy, psychoanalysis, hypnosis.
  - b) Drug therapy
  - c) Electro convulsive therapy

#### **Practical Syllabus**

1. History Taking
2. Clinical Assessment & Evolution of Patients with conditions and diseases mentioned in Theory Syllabus

#### **Books Recommended:**

1. Davidson's Principles and Practices of Medicine - Edward - Churchill Livingstone.
2. Hutchinson's Clinical Methods - Swash - Bailliere Tindall.
3. A Short Text Book of Medicine - Krishna Rao - Jaypee Brothers.
4. A Short Text Book of Psychiatry - Ahuja Niraj - Jaypee Brothers.



## **Paper – III: Physiotherapy in Orthopaedic Conditions**

### **Theory Syllabus**

#### **Section - I**

**Introduction** Brief review of the following surgical condition and various physiotherapeutic modalities, aims, means and technique of physiotherapy should be taught.

Traumatology General physiotherapeutic approach for the following conditions:

Fracture and dislocations; Classification and type of displacement, method of immobilisation, healing of fractures and factors affecting union, non union, delayed union etc. common sites of fractures.

Specific fractures and their complete physiotherapeutic management.

Upper Limb; Clavicle, humerus, ulna, radius, crush injuries of hand.

Lower Limb; fracture neck of femur, shaft of femur patella tibia fibula, pott's fracture, fracture of tarsal and metatarsals.

Spine; fracture and dislocations of cervical, thoracic and lumbar vertebrae with and without neurological deficits.

#### **Section - II**

Surgical procedures; Pre and post operative management of common corrective procedure like arthroplasty, arthrodesis, osteotomy, tendon transplants, soft tissue release grafting, including polio residual paralysis and leprosy deformities corrections.

Injuries; Soft tissue injuries, synovitis, capsulitis volkman's ischemic contracture etc. tear of semilunar cartilage and cruciate ligaments of knee, meniscectomy, patellectomy, internal derangement of knee.

Amputation; level of amputation of upper limb and lower limb, stump care, stump bandaging, pre and post prosthetic management including check out of prosthesis, training etc.

Deformities; congenital torticollis and cervical rib, CTEV, Pes cavus, pes planus and other common deformities.

Acquired – Scoliosis, kyphosis, lordosis, coxa vara, genu valgum, genu varum and recurvatum.

#### **Section - III**

Degenerative and infective conditions: osteoarthritis of major joints, spondylosis, spondylitis, spondylolisthesis, PIVD, Periarthritis of shoulder, Tuberculosis of spine, bone and major joint, perthes disease. Rheumatoid arthritis, Ankylosing spondylitis etc. and other miscellaneous orthopaedic conditions treated by physiotherapy.

Principles of sports physiotherapy – causes of sports injury, prevention of sports injuries,

management of acute sports injury, common occurred injuries. Role of physiotherapist in sports, principle & advanced rehabilitation of the injured athlete.

### **Practical Syllabus**

1. Practical demonstration of basic principles of physiotherapy assessment, functional assessment and applications of physiotherapy in orthopedics conditions.
2. Various physiotherapy modalities and treatment techniques for the above mentioned conditions to be demonstrated and practiced by the students in clinical setup.
3. Students must maintain a log book .The duly completed log book should be submitted during practical examination.

### **Books Recommended:**

1. Cash text book of Orthopaedics and Rheumatology for Physiotherapists – Downie - Jaypee Brothers.
2. Tidy's Physiotherapy - Thomson et al -Butterworth Heinmann.
3. Essentials of orthopaedics and applied physiotherapy – Joshi and Kotwal - B.L. Churchill Livingstone.
4. Tetraplegia & Paraplegia - Bromley - W.B. Saunders.
5. Orthopaedic Physiotherapy - Donatelli & Wooden - W.B. Saunders.
6. Rheumatological Physiotherapy - David - Mosby.
7. Orthopaedic Physiotherapy - Tids well - Mosby.
8. Physiotherapy for Amputee - Engstrom & Van de van - Churchill Livingstone.
9. Sports Injuries: Diagnosis and Management - Norris Butterworth Heinmann.

## **Paper – IV: Physiotherapy in Medical Condition-I**

### **Theory Syllabus**

#### **Section – I General Medicine**

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

1. Inflammation – acute, chronic and suppurative.
2. Oedema – Traumatic, obstructive, Paralytic, Oedema due to poor muscle and laxity of the fascia.
3. Arthritis and Allied Conditions (in details):
  - a) Osteo – arthritis – generalised, Degenerative and traumatic, Spondylosis and disorders.
  - b) Rheumatoid Arthritis, Still's disease, infective Arthritis.
  - c) Spondylitis, Ankylosing Spondylitis.
  - d) Nonarticular Rheumatism – Fibrositis, Myalgia, bursitis, Periarthritis etc.
4. Common conditions of Skin – Acne, Psoriasis, Alopecia, Leucoderma, Leprosy, Sexually transmitted diseases.
5. Deficiency diseases – Rickets, Diabetes, Obesity, Osteoporosis and other deficiency disorders related to Physiotherapy.
6. Psychiatric Disorders – Psychosis, Psychoneurosis, Senile dementia.

#### **Section – II Respiratory**

- 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.

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.

#### **Section – III Cardiovascular**

- 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.
- 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.

### **Practical Syllabus**

1. Various physiotherapy modalities and treatment techniques for the above mentioned conditions to be demonstrated and practiced by the students in clinical setup.
2. Students must maintain a log book .The duly completed log book should be submitted during practical examination.

**Books Recommended:**

1. Cash Textbook of General Medical and Surgical Conditions for Physiotherapists – Downie - Jaypee Brothers.
2. Essentials of Cardiopulmonary Physical Therapy - Hillegass & Sadowsky - W.B. Saunders.
3. Cash Textbook of Chest, Heart and Vascular Disorders for Physiotherapists - Downie - J.P. Brothers.
4. The Brompton Guide to Chest Physical Therapy.
5. Cardiopulmonary Physical Therapy - Irwin and Tecklin - Mosby.
6. Cardiovascular / Respiratory Physiotherapy - Smith & Ball - Mosby.
7. ACSM Guidelines for Exercise Testing and Prescription - ACSM - Williams and Wilkins.
8. Chest Physiotherapy in Intensive Care Unit - Mackenzie et al - Williams and Wilkins.

## **Syllabus BPT 3<sup>rd</sup> Year**

### **Paper – V: Research Methodology and Biostatistics**

#### **Theory Syllabus**

##### **Section – I**

1. Introduction: Importance of research in clinical practice, scientific approach, characteristics, purposes and limitations.
2. Ethical issues in research, elements of informed consent.
3. Structure of a research proposal.

##### **Section – II**

1. Research Question including literature review.
2. Measurement: Principles of measurement, reliability and validity.
3. Experimental sampling and design.
4. Descriptive research.

##### **Section – III**

#### **Biostatistics:**

1. Descriptive statistics
2. Comparison of means, T – tests.
3. Analysis of Variance.
4. Qualitative and quantitative observations, Measures of Central Tendency – Arithmetic Mean, Median and Mode, Position of averages.  
Graphical representation of data.
5. Measures of dispersion – range, variance, mean deviation, standard deviation and coeff. of variation.  
Frequency distribution
6. Correlations

#### **Books Recommended:**

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

## **Paper – VI: Neurology**

### **Theory Syllabus**

#### **Section – I**

1. **Neuroanatomy:** Review the basic anatomy of the brain and spinal cord including: Blood supply of the brain and spinal cord, anatomy of the visual pathway, connections of the cerebellum and extrapyramidal system, relationship of the spinal nerves to the spinal cord segments, long tracts of the spinal cord, the brachial and lumbar plexus and cranial nerves.
2. **Neurophysiology:** Review in brief the Neurophysiological basis of: tone and disorders of the tone and posture, bladder control, muscle contraction, movement and pain.
3. Assessment and evaluative procedures for the neurological patient.
4. Review of the principles of the management of a neurological patient.

#### **Section – II**

Briefly outline the etiology, clinical features and management of the following Neurological disorders: -

1. Congenital and childhood disorders – Cerebral palsy, Hydrocephalus and Spina Bifida.
2. Cerebrovascular accidents – General classification, thrombotic, embolic, haemorrhagic & inflammatory, strokes, gross localisation and sequelae.
3. Trauma – localization, first aid and management of sequelae of head injury and spinal cord injury.
4. Diseases of the spinal cord – Craniovertebral junction anomalies, Syringomyelia, Cervical and lumbar disc lesions, Tumors and Spinal arachnoiditis.
5. Demyelinating diseases (central and peripheral) – Guillain – Barre syndrome, Acute disseminated encephalomyelitis, Transverse myelitis and Multiple sclerosis.

#### **Section – III**

Briefly outline the etiology, clinical features and management of the following Neurological disorders: -

1. Degenerative disorders – Parkinson's disease and dementia.
2. Infections – Pyogenic Meningitis sequelae, Tuberculous infection of central nervous system and Poliomyelitis.
3. Diseases of the muscle – Classification, signs, symptoms, progression and management.
4. Peripheral nerve disorders – Peripheral nerve injuries, Entrapment neuropathies and Peripheral neuropathies.

#### **Section – IV**

1. Epilepsy – Definition, classification and management.
2. Myasthenia Gravis - Definition, course and management.
3. Intracranial Tumors – Broad classifications, signs and symptoms.
4. Motor neuron disease - Definition, classification and management.

5. Cranial nerve – Types of Disorders, clinical manifestation & management.

### **Section – V**

1. Introduction to neuropsychology.
2. General assessment procedures and basic principles of management.

### **Practical Syllabus**

Clinical Assessment and Evaluation of various neurological disorders and the basic principles of Management

### **Books Recommended:**

1. Brain's Diseases of the Nervous System - Nalton – ELBS.
2. Guided to clinical Neurology - Mohn & Gaectier - Churchill Livingstone.
3. Principles of Neurology - Victor – McGraw Hill International edition.
4. Davidson's Principles and Practices of Medicine - Edward - Churchill Livingstone.

## Syllabus for Fourth Year

### Paper – I: General Surgery

#### Theory Syllabus

##### Section – I

1. Introduction to principles of surgery and its procedure.
2. Shock – definition, types, clinical feature, pathology & management.
3. Haemorrhage – common sites, complication, clinical features & management.
4. Blood Transfusion – Blood group matching, indication & complication.
5. Anaesthesia – Principles of anaesthesia, types & procedure.

##### Section –II

1. Wounds, Tissue repair, Classification – Acute Wounds, Chronic wounds, Scars & their Management.
2. Wound infections: - Psychology and manifestation, Types of infections & their Management.
3. Tumors and Ulcers: -
  - a) Tumors – Types & Management.
  - b) Ulcers – Types & Management.
4. Burns – Causes, Classification, Clinical features & Management.
5. Skin Grafting – Indications, Types & Procedures.
6. Hand Infections – Types & Management.
7. General Injuries – Types & Management.

##### Section – III

1. Complications of Surgery.
2. Abdominal Surgery – Types of Incisions & common surgical procedures.
3. Thoracic and Cardiac Surgery – Types of incisions & common surgical procedures.

##### Section – IV

#### Obstetrics & Gynaecology:

1. Pregnancy, stages of labour & its complications, indications & types of surgical procedures.
2. Gynaecological disorders – Salpingitis, parametritis, retro-uterus, prolapse of uterus, pelvic inflammatory diseases, urinary incontinence.

##### Section – V

#### Ophthalmology:

1. Common inflammations and other infections of eye.
2. Ptosis
3. Blindness – common causes & management.
4. Refractions – testing, errors & remedies
5. Strabismus – types, features & corrective measures.

##### Section – VI

#### Ear, Nose & Throat (ENT)

1. Introduction – Outline, mechanism of audition, olfaction & speech.
2. Classify causes of hearing impairment, assessment techniques, conservative & surgical management.
3. Hearing Aids – types & indications.
4. Outline common ENT infections & lesions, which affect hearing, breathing, speech & their management.



5. Outline the function of vestibular organ, its common disorders & their management.

### **Practical Syllabus**

1. History taking
2. Clinical Assessment & Evaluation of Patients with various general surgeries, Gynaecology Procedures, Ophthalmology and ENT Procedures.
3. Treatment for the conditions covered in General Surgery.

### **Books Recommended:**

1. Baily and Love - Short Practice of Surgery - Mann and Rains - H.K. Levis Publications, London.
2. Undergraduate Surgery - Nan - Academic Publishers, Calcutta.
3. Textbook of Surgery - Gupta R.L. - Jaypee.
4. Principles and Practices of Trauma Care - Kocher - Jaypee.
5. Clinical Methods - S. Das - Calcutta.

## **PAPER-II: Community Physiotherapy & Rehabilitation**

### **Theory Syllabus**

#### **Section-I**

- Surveillance, Monitoring & Screening in Occupational Health
  - Types & purposes of work place health examination
  - Ethical Issues in health examination in the work place
- Work Disability
  - Definition
  - Causes & Prevention
  - Management

#### **Section –II**

- Ergonomics & Work related Musculoskeletal disorders
  - Fatigue
  - Chronic work related musculoskeletal disorders
  - Occupational low back pain
  - Management of Work related Musculoskeletal disorders
- Role of physiotherapy in occupational disorders

#### **Section –III**

- Industrial Hygiene
  - Recognition of Occupational & Environmental Hazards
  - Hazard Evaluation
  - Hazard Control

#### **Section –IV**

- Women's Occupational Health Problem
  - Musculoskeletal disorders

#### **Section-V**

- Community Obstetrics
- Social Obstetrics
- Maternal & Child Health
  - Health indicators

Goals of MCH services

#### **Section –VI**

- Nutrition in Public Health & Preventive Medicine
  - Nutritional deficiencies : Causes & Consequences
  - Dietary Recommendations
  - Nutritional disorders in women

#### **Section –VII**

- Family Planning Programs & Practices
  - Goals
  - Policies & Laws
  - Effects
  - Family Planning Problems in Public Health

#### **Section –VIII**

- Health Problems of the Aged due to
  - Ageing
  - Illness
  - Psychological causes
- Physiotherapy approach to Geriatric Conditions

### **Practical Syllabus**

Community work by Physiotherapist based on different work places.

#### **Books recommended:**

1. Textbook of community Medicine ( Preventive & Social Medicine) –Sunder Lal.
2. Park's Textbook of Preventive and Social Medicine.-K. Park- Bhanot Publishers.

3. IAPSM's Textbook of Community Medicine-AM Kadri
4. Textbook of Community Medicine – Rajvir Bhalwar.

## BPT 4<sup>th</sup> Year

### Paper – III: Paediatrics & Geriatrics

#### Theory Syllabus

#### Section – I

##### Paediatrics:

1. Review normal foetal development & child birth, including assessment of a neonate.
2. Development of a normal child – neuromotor, physical growth, cognitive, intellectual, social etc.
3. The examination & assessment of a pediatric patient.
4. Congenital & acquired muscular skeletal disorders:- Spinal muscular atrophy, Guillain Barre syndrome, Myasthenia gravis, Duchenne muscular dystrophy, Becker's dystrophy – etiology, clinical manifestation & principles of management.
5. Congenital & acquired Cardio - pulmonary disorders – Choanal Atresia, Laryngomalacia, Pneumonia, Acute epiglottitis, ALTB (acute laryngo tracheo bronchitis), Acute Bronchitis, Foreign body in airways, Asthma, Cystic fibrosis- etiology, clinical manifestation & principles of management.
6. Congenital & acquired neurological disorders:- (CNS & PNS), Neural tube defect, Hydrocephalus, Seizures disorder, Cerebral palsy, Meningitis, Neurocutaneous Syndrome – etiology, clinical manifestation & principles of management.
7. Hereditary disorders:- Autosomal dominant, Autosomal recessive, X linked recessive, X linked dominant, Non Mendelian inheritance, Non Mendelian inheritance, Multi factorial inheritance - etiology, clinical manifestation & principles of management.  
Genetic disorders:- Trisomy 21, Trisomy 18, Trisomy 13, Turner syndrome, Noonan syndrome, Klinefelter syndrome, Fragile X syndrome1 - etiology, clinical manifestation & principles of management.
8. Nutritional Vitamins Deficiency & Development Disorders:- Fat soluble, Vitamin A, Vitamin D, Vitamin E, Vitamin K, Water soluble, Vitamin B (B1, B2, B3, B5, B7, B9, B12, B6), Vitamin C– etiology, clinical manifestation & principles of management.
9. Burns, Injuries & accident – Types & principles of management, including preventive care.
10. Surgical intervention – Indications & common surgical procedure.
11. Cardiovascular Disease-Acyanotic heart diseases (VSD, ASD, PDA, COARCTATION OF AORTA), Cyanotic heart diseases (Tetralogy of Fallot, Tricuspid Atresia, Ebstein anomaly, TGA, TAPVC, Truncus arteriosus), Acute rheumatic fever, Infective Endocarditis - etiology, clinical manifestation & principles of management.

#### Section – II

##### Geriatrics:

1. Normal aging – definition, the anatomical, physiological and cognitive changes related to aging.
2. Epidemiology and socio- economic impact of aging.
3. The examination & assessment of a geriatric patient.
4. Musculo skeletal disorders – etiology, clinical manifestation & principles of management.
5. Cardio - pulmonary disorders – etiology, clinical manifestation & principles of management.
6. Neurological disorders (CNS & PNS) – etiology, clinical manifestation & principles of management.

7. Diet & Nutritional requirement of the elderly. Nutritional disorders & their management.
8. Burns, Injuries & accident as related to the elderly & preventive care.
9. Dementia – Types and principles of management.
10. Overview of depressive disorders in the elderly.

### **Practical Syllabus**

Evaluation, Clinical Diagnosis and Treatment for the conditions covered in Paediatrics & Geriatrics.

### **Books Recommended:**

1. Nelson's Textbook of Paediatrics - Behrman & Vaughan - W.B. Saunders.
2. Textbook of Paediatrics - Parthsarthy - Jaypee.
3. The Short Textbook of Paediatrics - Gupte - Jaypee.
4. Geriatric Physical Therapy - Guccione - Mosby.
5. Motor Assessment of the Developing infant - Piper & Davrah - W.B. Saunders.

## **Paper – IV: Physiotherapy in Medical Conditions - II**

### **Theory Syllabus**

#### **Section-I Theory Neurology**

1. Examination of Neurological disorders and principles of treatment.
2. Knowledge of various investigative procedures (invasive & noninvasive) used in the diagnosis of various neurological disorders.
3. Review of pathological changes and principle of management by physiotherapy of the following conditions:
  - a) Hemiplegia, Paraplegia, Tabes dorsalis, cerebellar ataxia, extra pyramidal lesions, Gullian Barre Syndrome, Parkinsonism.
  - b) Disseminated sclerosis, Amgotrophic lateral sclerosis, Siringomyela subacute combined degeneration of cord motor neuron disease.
  - c) Peripheral Nerve and cranial Nerve lesions.
  - d) Neuritis and Neuralgia – Brachial, sciatic etc.
  - e) Infections – Poliomyelitis, meningitis, Encephalitis, Polyneuritis Transverse myelitis.
  - f) Traumatic head injuries and spinal cord injury.

#### **Section – II Paediatrics**

- A. Review of the examination & assessment of a Paediatric patient.
- B. Review of pathological changes and principle of management by physiotherapy of the following conditions:
  - 1) Common congenital & acquired musculo skeletal disorders.
  - 2) Common congenital & acquired neurological disorders (CNS & PNS).
  - 3) Common heredity disorders.
  - 4) Common nutritional, metabolic & vitamin deficiency disorders.
  - 5) Cerebral palsy, myopathy and muscular dystrophies.

#### **Section – III Geriatrics**

- A. Review of the examination & assessment of a Geriatric patient.
- B. Review of pathological changes and principle of management by physiotherapy of the following conditions:
  - 1) Musculo skeletal disorders.
  - 2) Cardiopulmonary disorders.
  - 3) Neurological disorders (CNS & PNS).
  - 4) Injuries & accidents specific to the aged.

## **Practical Syllabus**

1. Various Physiotherapy modalities and treatment techniques for above mentioned conditions should be demonstrated and practiced by the students in clinical setup.
2. Students must maintain a log book .The duly completed log book should be submitted during practical examination.

### **Books Recommended:**

1. Cash's Textbook of Neurology for Physiotherapists - Downi - J.P. Brothers.
2. Adult Hemiplegia – Evaluation & Treatment - Bobath - Oxford Butterworth Heinmann.
3. Neurological Rehabilitation – Carr & Shepherd -Butterworth Heinmann.
4. Tetraplegia & Paraplegia – A Guide for Physiotherapist - Bromley - Churchill Livingstone.
5. Neurological Physiotherapy – A Problem Solving Approach - Susan Edwards - Churchill Livingstone.
6. Neurological Rehabilitation - Umpherd - Mosby.
7. Geriatric Physical Therapy - Gucciona - Mosby.
8. Motor Assessment of Developing Infant - Piper & Darrah - W.B, Saunders.
9. Paediatric Physical Therapy - Teckling - Lippincott.
10. Treatment of Cerebral Palsy and Motor Delay - Levitts - Blackwell Scientific Publications, London.
11. Aging the Health Care Challenge - Levis - F.A. Davis.
12. Physiotherapy in Paediatrics - Shepherd - Butterworth Heinmann.

## **Paper – V: Physiotherapy in Surgical Conditions**

### **Theory Syllabus**

#### **SECTION – I Thoracic Surgery**

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

- 1) Lobectomy, Pneumonectomy, Thoracotomy, Thoracoplasty, Endoscopy & eye hole surgeries.
- 2) Corrective surgeries of congenital heart defects, angioplasties, blood vessel grafting, open heart surgeries & heart transplant.

#### **SECTION – II General, Gynaecology and Obsterics and ENT**

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

- 1) Common abdominal surgeries, including GIT, liver, spleen, kidney, bladder etc.
- 2) Common operation of reproductive system, including surgical intervention for child delivery. Ante natal & post natal, physiotherapy
- 3) Common operations of the ear, nose, throat & jaw as related to physiotherapy.
- 4) Common organ transplant surgeries – heart, liver, bone marrow etc.

### **SECTION – III** **Wounds, Burns & Plastic Surgery**

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

- 1) Wounds, ulcers, pressure sores.
- 2) Burns & their complications.
- 3) Common reconstructive surgical proceedings of the management of wounds, ulcers, burns & consequent contractures & deformities.

### **SECTION – IV** **Neurosurgery**

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

- 1) Common surgeries of the cranium & brain.
- 2) Common surgeries of vertebral column & spinal cord.
- 3) Common surgeries of peripheral nerves.
- 4) Surgical interventions in traumatic head injuries.

### **SECTION – V** **ICU (Intensive Care Unit) and Ventilation**

- 1) Intensive Therapy – Clinical Management
- 2) Intensive Therapy – Apparatus (Ventilations, Tubes, Humidifiers etc.)
- 3) Intensive Therapy – Adult Patient
- 4) Paediatric & Neonatal Intensive Therapy

#### **Practical Syllabus**

1. Clinical evaluation, diagnosis and treatment of various surgical conditions including various physiotherapy modalities and approaches.
2. Students must maintain a log book .The duly completed log book should be submitted during practical examination.

#### **Books Recommended:**

1. Cash Textbook of general medical and surgical conditions for physiotherapists – Downie – Jaypee Brothers.
2. Cash textbook of heart, chest and vascular disorders for physiotherapists – Downie – Jaypee Brothers.
3. Principles and practices of cardiopulmonary physical therapy – Frown Felter – Mosby.
4. Chest physiotherapy in intensive care unit – Mackenzie – Williams & Wilkins.
5. Restoration of Motor Functions in stroke patient: A Physiotherapist Approach – Johnstone –



Churchill Livingstone.

6. Physiotherapy in obstetrics and gynaecology – Polden – F.A. Davis.

### **Internship Schedule**

There shall be six months of internship after the final year examination for candidates declared to have passed the examination in all the subjects.

During the internship candidate shall have to work full time average 7 hours per day (each working day) for 6 Calendar months.

Each candidate is allowed maximum of 6 holidays during entire Internship Program and in case of any exigencies during which the candidate remains absent for a period more than 6 days, he/she will have to work for the extra days during which the candidate has remained absent.

The Internship should be rotator and cover clinical branches concerned with Physiotherapy such as Orthopedics, Cardiothoracic including ICU, Neurology, Neurosurgery, Paediatrics, General Medicine, General Surgery, Obstetrics and Gynaecology both inpatient and outpatient services.

Based on the attendance and work done during posting the Director Principal/Head of the institution/department shall issue "Certificate of Satisfactory completion" of following which the University shall award the Bachelor of Physiotherapy Degree or declare the candidate eligible for the same.

**No candidate shall be awarded degree without successfully completing six months internship.**

Institution shall have to satisfy themselves that satisfactory infrastructure facilities of Physiotherapy exist in the Institute/Hospital where the internship training has to be undertaken.

Following parameters/guidelines have been suggested:

- a. It is mandatory for the Institution to have its own Physiotherapy clinic fully furnished with all the necessary equipments as per the curriculum of the Program.
- b. Senior Physiotherapy with sufficient clinical experience should manage the physiotherapy departments in the institutes/Hospital.

Institute Director/ Principal can at his discretion grant NOC to the students to do the Internship at the place of his choice provided the concerned Hospital fully satisfies the above criteria. For the purpose of granting NOC the candidate shall have to submit to the Institution the status of Physiotherapy services available at the place where he intends to do his Internship.

All the students after passing Final Prof. B.P.T. examination shall go in for six months supervised compulsory rotator internship in the following areas:

- |     |                                      |         |
|-----|--------------------------------------|---------|
| i)  | Physiotherapy Out-Patient Department | 1 month |
| ii) | ICU & ICCU                           | 15 days |

iii)	General Medicine	15 days
iv)	General Surgery	15 days
v)	Paediatrics	15 days
vi)	Cardiology	15 days
vii)	Neurology	15 days
viii)	Neurosurgery	15 days
ix)	Cardiothoracic surgery	15 days
x)	Orthopaedics	15 days
xi)	Physical Medicine & Rehabilitation	15 days

All efforts should be made to ensure that the BPT intern gets posted to the above mentioned disciplines for the duration indicated. However, where some of the above facilities are not existing, efforts for attachments with the Institutions affiliated with **BFUHS** where these are available should be made. Failing these the interns may be posted in those disciplines which closely match the missing disciplines, for the internship posting.