

Semester wise Syllabus

Bachelor of Physiotherapy
(BPT)

Academic Programme

Ordinance according to
NEP-2020

Duration: 4 years & 06 Months
(8 Semesters & 6 Months Internship)

BACHELOR OF PHYSIOTHERAPY (BPT)

ORDINANCE

Chapter "A"

Learning Objectives: At the completion of this course, the student should be –

1. The purpose of this curriculum is to delineate the cognitive, affective and psychomotor skills deemed essential for completion of this program and to perform as a competent physiotherapist who will be able to examine, evaluate, diagnose, plan, execute and document physiotherapy treatment independently or along with the multidisciplinary team.
2. Evaluate patients for impairments and functional limitations and able to execute all routine physiotherapeutic procedures as per the evaluation.
3. Able to operate and maintain physiotherapy equipment used in treatment of patient, physiotherapy treatment planning (both electrotherapy and exercise therapy) & procedures independently.
4. Able to provide patient education about various physiotherapeutic interventions to the patient and care givers.

Expectations from the future physiotherapy graduates

1. Coursework entitles independent physiotherapy assessment and treatment in any healthcare delivery centers in India by the graduates.
2. The coursework is designed to train students to work as independent physiotherapists or in conjunction with a multidisciplinary team to diagnose and treat movement disorders as per red and yellow flags.
3. Course works will skill the graduate's physical/ functional diagnosis, treatment planning, management, administration of physiotherapy treatment and for patient support.
4. Graduates can found employment opportunities in hospitals/nursing homes/sports teams/fitness centers/Community Rehabilitation /Health planning boards/health promotions services in both private and public sectors as well as in independent physiotherapy clinics.
5. Physiotherapy graduate is encouraged to pursue further qualification to attain senior position in the professional field and also to keep abreast with the recent advances, new technology and research. The professional should opt for continuous professional education credits offered by national and international institutes.

Terminal Objectives (Expected Outcomes):

1. The graduate will be a competent and reflective physiotherapy practitioner who can function safely and effectively while adhering to legal, ethical and professional standards of practice in a multitude of physiotherapy settings for patients and clients across the lifespan and along the continuum of care from wellness and prevention to rehabilitation of dysfunction.
2. The graduate will utilize critical inquiry and evidence based practice to make clinical decisions essential for autonomous practice.
3. The graduate will function as an active member of professional and community organizations. The graduate will be a service-oriented advocate dedicated to the promotion and improvement of community health.
4. The graduate will demonstrate lifelong commitment to learning and professional development.

1. Bachelor of Physiotherapy degree will be under the **faculty of Medicine** of C.S.J.M. University, Kanpur.

2. Duration of Course :

- Bachelor of Physiotherapy course will be a full time course.
- Duration will be Four years (08 Semesters) followed by compulsory 06 months internship.

3. No. of Seats :

Total no. of Students to this course **shall be 90.**

4. Admission.

Eligibility Criteria:

For admission in this course candidate has to pass 10 + 2 or its equivalent examination in Science (Biology) conducted by any Board or University incorporated by law and recognized by this University with minimum 50% marks in aggregate in Physics, Chemistry & Biology (relaxation of 5% marks for SC/ST student).

Mode of Admission:

As per the University Norms.

5. Medium of instruction:

English shall be the medium of instruction in the class and in the University examination.

6. Method of Teaching:

The method of teaching adopted shall be a combination of lectures, demonstrations and practicals by the full time faculty, visiting or part time or guest faculty.

"B"

Regulations : Scheme of Examination

BPT- Semester-I University Examination

S. No.	Subjects	Subject code	THEORY MARKS			PRACTICAL MARKS			Total Marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1	Anatomy-I	BPT-101	75	25	100	75	25	100	200
2	Physiology-I	BPT-102	75	25	100	75	25	100	200
3	Clinical Biochemistry	BPT-103	75	25	100	-	-	-	100
4	Health Psychology	BPT-104	75	25	100	-	-	-	100
Grand Total									600

BPT- Semester-II University Examination

S. No.	Subjects	Subject code	THEORY MARKS			PRACTICAL MARKS			Total Marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1	Anatomy-II	BPT-201	75	25	100	75	25	100	200
2	Physiology-II	BPT-202	75	25	100	75	25	100	200
3	Yoga-Basic Theory, Science & Techniques	BPT-203	75	25	100	75	25	100	200
4	First Aid and Emergency Care	BPT-204	75	25	100	-	-	-	100
Grand Total									700

BPT- Semester-III University Examination

S: N o	Subjects	Subject Code	THEORY MARKS			PRACTICAL MARKS			Total Marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1.	Basic Principles of Biomechanics	BPT-301	75	25	100	-	-	-	100
2.	Exercise Therapy-I	BPT-302	75	25	100	75	25	100	200
3.	Electrotherapy – I	BPT-303	75	25	100	75	25	100	200
4.	Pathology	BPT-304	75	25	100	-	-	-	100
Grand Total									600

BPT- Semester-IV University Examination

S: N o	Subjects	Subject Code	THEORY MARKS			PRACTICAL MARKS			Total Marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1.	Biomechanics and Kinesiology	BPT-401	75	25	100	75	25	100	200
2.	Electrotherapy – II	BPT-402	75	25	100	75	25	100	200
3.	Microbiology	BPT-403	75	25	100	-	-	-	100
4.	Pharmacology	BPT-404	75	25	100	-	-	-	100
Grand Total									600

BPT- Semester-V University Examination

S. N o.	Subjects	Subject Code	THEORY MARKS			PRACTICAL MARKS			Total Marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1.	Exercise Therapy-II	BPT-501	75	25	100	75	25	100	200
2.	Clinical Orthopaedics and Traumatology	BPT-502	75	25	100	-	-	-	100
3.	General Medicine including paediatrics and psychiatry	BPT-503	75	25	100	-	-	-	100
4.	General Surgery	BPT-504	75	25	100	-	-	-	100
Grand Total									500

BPT- Semester-VI University Examination

S: N o	Subjects	Subject Code	THEORY MARKS			PRACTICAL MARKS			Total Marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1.	Clinical Neurology and Neurosurgery	BPT-601	75	25	100	-	-	-	100
2.	Cardiology and Pulmonology	BPT-602	75	25	100	-	-	-	100
3.	Community Medicine	BPT-603	75	25	100	-	-	-	100
4.	Research methodology and Biostatistics	BPT-604	75	25	100	-	-	-	100
Grand Total									400

BPT- Semester-VII University Examination

S: N o	Subjects	Subject Code	THEORY MARKS			PRACTICAL MARKS			Total Marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1.	Physiotherapy in orthopaedic conditions	BPT-701	75	25	100	75	25	100	200
2.	Physiotherapy in Neurological Condition	BPT-702	75	25	100	75	25	100	200
3.	Physiotherapy in Cardiopulmonary and Intensive Care	BPT-703	75	25	100	75	25	100	200
Grand Total									600

BPT- Semester-VIII University Examination

S: N o	Subjects	Subject Code	THEORY MARKS			PRACTICAL MARKS			Total Marks
			Theory Paper	Internal Assessment	Total	Practical	Internal Assessment	Total	
1.	Physiotherapy in Sports	BPT-801	75	25	100	75	25	100	200
2.	Physiotherapy in General Medicine and General Surgery	BPT-802	75	25	100	75	25	100	200
3.	Community Physiotherapy and Rehabilitation	BPT-803	75	25	100	75	25	100	200
Grand Total									600

INTERNAL ASSESSMENT

- It will be for theory and practical both.
- It will be done through the whole semester.
- Candidate must obtain at least 40% marks in theory and practicals separately in internal assessment to be eligible for the semester university examination.

- **Internal assessment (Theory)** will be done as follows:

- | | | |
|----|--|------------|
| a) | Mid-term/ class test etc. | = 10 marks |
| b) | Assignments/Project/Quiz/ Presentations etc. | = 10 marks |
| c) | Attendance | = 05 marks |

Total = 25 marks

- **Internal assessment (Practical)** will be done as follows:

- | | | |
|----|--|------------|
| a) | Laboratory Manual/Assignments/Class test etc. | = 10 marks |
| b) | Day to day performance/continuous evaluation/record etc. | = 10 marks |
| c) | Attendance | = 05 marks |

Total = 25 marks

EXAMINATION:

- As per the University norms

Duration of Examination:

- Each theory paper shall be of three-hours duration OR as per the University norms.

CRITERIA FOR PASSING

- As per University Norms.

DIVISION:

- As per the University Norms.

DEGREE:

- The degree of B.P.T. course of the University shall be conferred on the candidates who have pursued the prescribed course of study for not less than four academic years and have passed examinations as prescribed under the relevant scheme and completed 6 months of compulsory rotatory internship.

BACHELOR OF PHYSIOTHERAPY (BPT)

Syllabus

Course of Study

Bachelor of Physiotherapy – First Semester

S. No.	Subjects	Subject Code	Teaching hours			Credit Hours
			Theory	Practicals	Total	
1	Anatomy-I	BPT-101	60	60	120	6
2	Physiology-I	BPT-102	60	60	120	6
3	Clinical Biochemistry	BPT-103	80	-	80	4
4	Health Psychology	BPT-104	80	-	80	4
5*	Ethics in physiotherapy practice		20	-	20	1
				Total	420	21

* Not included for university examination

Bachelor of Physiotherapy – Second Semester

S. No.	Subjects	Subject Code	Teaching hours			Credit Hours
			Theory	Practicals	Total	
1	Anatomy-II	BPT-201	60	60	120	6
2	Physiology-II	BPT-202	60	60	120	6
3	Yoga-Basic Theory, Science & Techniques	BPT-203	40	40	80	4
4	First Aid and Emergency Care	BPT-204	80	-	80	4
				Total	400	20

Bachelor of Physiotherapy – Third Semester

S: no	Subjects	Subject Code	Teaching hours			Credit Hours
			Theory	Practicals	Total	
1	Basic Principles of Biomechanics	BPT-301	40	40	80	4
2	Exercise Therapy-I	BPT-302	60	60	120	6
3	Electrotherapy – I	BPT-303	60	60	120	6
4	Pathology	BPT-304	80	-	80	4
5*	Clinical observation posting (at least 2 hours /day in physiotherapy OPD or in a hospital)			240	240	10
				Total	640	30

* Not included for university examination

Bachelor of Physiotherapy – Fourth Semester

S: no	Subjects	Subject Code	Teaching hours			Credit Hours
			Theory	Practicals	Total	
1	Biomechanics and Kinesiology	BPT-401	60	60	120	6
2	Electrotherapy – II	BPT-402	60	60	120	6
3	Microbiology	BPT-403	80	-	80	4
4	Pharmacology	BPT-404	80	-	80	4
5*	Clinical observation posting (at least 2 hours /day in physiotherapy OPD or in a hospital)			240	240	10
				Total	640	30

* Not included for university examination

Bachelor of Physiotherapy – Fifth Semester

S: no	Subjects	Subject Code	Teaching hours			Credit Hours
			Theory	Practicals	Total	
1	Exercise Therapy-II	BPT-501	60	60	120	6
2	Clinical Orthopaedics and Traumatology	BPT-502	80	-	80	4
3	General Medicine including paediatrics and psychiatry	BPT-503	80	-	80	4
4	General Surgery	BPT-504	80	-	80	4
5*	Supervised rotatory clinical training (at least 2 hours /day in physiotherapy OPD or in a hospital)			240	240	10
				Total	600	28

* Not included for university examination

Bachelor of Physiotherapy – Sixth Semester

S: no	Subjects	Subject Code	Teaching hours			Credit Hours
			Theory	Practicals	Total	
1	Clinical Neurology and Neurosurgery	BPT-601	120	-	120	6
2	Cardiology and Pulmonology	BPT-602	80	-	80	4
3	Community Medicine	BPT-603	80	-	80	4
4	Research methodology and Biostatistics	BPT-604	120	-	120	6
5*	Supervised rotatory clinical training (at least 2 hours /day in physiotherapy OPD or in a hospital)			240	240	10
				Total	640	30

* Not included for university examination

Bachelor of Physiotherapy – Seventh Semester

S: no	Subjects	Subject Code	Teaching hours			Credit Hours
			Theory	Practicals	Total	
1	Physiotherapy in orthopaedic conditions	BPT-701	60	60	120	6
2	Physiotherapy in Neurological Condition	BPT-702	60	60	120	6
3	Physiotherapy in Cardiopulmonary and Intensive Care	BPT-703	60	60	120	6
4*	Supervised rotatory clinical training (at least 2 hours /day in physiotherapy OPD or in a hospital)			240	240	10
				Total	600	28

* Not included for university examination

Bachelor of Physiotherapy – Eighth Semester

S: no	Subjects	Subject Code	Teaching hours			Credit Hours
			Theory	Practicals	Total	
1	Physiotherapy in Sports	BPT-801	60	60	120	6
2	Physiotherapy in General Medicine and General Surgery	BPT-802	60	60	120	6
3	Community Physiotherapy and Rehabilitation	BPT-803	60	60	120	6
4*	Supervised rotatory clinical training (at least 2 hours /day in physiotherapy OPD or in a hospital)			240	240	10
				Total	600	28

* Not included for university examination

INTERNSHIP:

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 rotatory and cover clinical branches concerned with Physiotherapy such as Orthopaedics, 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 institution/department shall issue '**Certificate of Satisfactory completion**' of training 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:

- 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.
- Senior Physiotherapist with sufficient clinical experience should manage the physiotherapy departments in the Institutes/Hospitals.

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.

Bachelor of Physiotherapy (BPT)-I Semester

ANATOMY-I

Subject code: BPT-101

Minimum hours: Theory-60 Hrs., Practical-60 Hrs.

COURSE OBJECTIVES - It is designed to provide students with the working knowledge of the structure of the human body which is essential foundation for their clinical studies. The study of anatomy will include identification of all gross anatomical structures. Particular emphasis will be placed on description of bones, joints, muscles, the brain, cardio pulmonary and nervous system, as these are related to the application of physiotherapy in patients.

COURSE LEARNING OUTCOMES: The student will be able to –

1. Describe anatomical aspects of muscles, bones, joints, their attachments of thorax and upper quadrant and to understand and discuss analysis of movements with respect to bones, joints and soft tissues related to musculoskeletal system of thorax & upper extremity.
2. Describe structures of the cardio-vascular & respiratory system, mechanism of respiration and the course of blood vessels, structure of rib cage & its contents with special emphasis to lungs, tracheo-bronchial tree, respiratory muscles & heart.
3. Describe source & course of major arterial, venous & lymphatic system, related to upper quadrant, thorax and heart.
4. Describe various structures of the genito-urinary system, abdomen, pelvic organs and sense organs and apply knowledge to living anatomy

THEORY

Topics to be covered:

1. General Anatomy:

- Introduction to Anatomy, terms and terminology.
- Regions of Body, Cavities and systems.
- Surface anatomy – musculo-skeletal, vascular, cardiopulmonary system
- General Embryology.
- Applied anatomy.

2. Musculoskeletal system.

- Connective tissue & its modification, tendons, membranes, special connective tissue.
- Bone structure, blood supply, growth, ossification, and classification.
- Muscle classification, structure and functional aspect.
- Joints – classification, structures of joints, movements, range, limiting factors, stability, blood supply, nerve supply, dislocations and applied anatomy.

2(a). Upper extremity:

- Bony architecture
- Joints – structure, range of movement
- Muscles – origin, insertion, actions, nerve supply
- Major nerves – course, branches and implications of nerve injuries
- Development of limb bones, muscles and anomalies
- Radiographic identification of bone and joints
- Applied anatomy

2(b). Lower Extremity:

- Bony architecture
- Joints – structure, range of movement
- Muscles – origin, insertion, actions, nerve supply
- Major nerves – course, branches and implications of nerve injuries
- Development of limb bones, muscles and anomalies
- Radiographic identification of bone and joints
- Applied anatomy

2(c). Spine and thorax

- Back muscles - Superficial layer, Deep muscles of back, their origin, insertion, action and nerve supply.
- Vertebral column – Structure & Development, Structure & Joints of vertebra

- Thoracic cage
 - Radiographic identification of bone and joints
 - Applied anatomy
- 2(d). Head and neck:
- Cranium
 - Facial Muscles – origin, insertion, actions, nerve supply
 - Temporomandibular Joints – structure, types of movement

PRACTICAL

COURSE OBJECTIVES - It is designed to provide students with the working knowledge of the structure of the human body which is essential foundation for their clinical studies.

COURSE LEARNING OUTCOMES: The student will be able to –

1. Describe anatomical aspects of muscles, bones, joints, their attachments of thorax and upper quadrant & to understand and discuss analysis of movements with respect to bones, joints and soft tissues related to musculoskeletal system of thorax, & upper extremity.
2. Describe structures of the cardio vascular & respiratory system, mechanism of respiration and the course of blood vessels, structure of rib cage & its contents with special emphasis to lungs, tracheo-bronchial tree, respiratory muscles & heart.
3. Describe source & course of major arterial, venous & lymphatic system, related to upper quadrant, thorax and heart.
4. Describe various structures of the genito-urinary system, abdomen, pelvic organs and sense organs and apply knowledge to living anatomy

Topics to be covered:

1. Identification and description of all anatomical structures.
2. The learning of Anatomy is by demonstration only through dissected parts, slides, models, charts, etc.
3. Demonstration of dissected parts (upper extremity, lower extremity&thoracic).
4. Demonstration of skeleton- articulated and disarticulated.
5. During the training more emphasis will be given on the study of bones, muscles, joints, nerve supply of the limbs and arteries of limbs.
6. Surface anatomy;
 - surface land mark-bony, muscular and ligamentous.
 - surface anatomy of major nerves, arteries of the limbs.
7. Points of palpation of nerves and arteries.

PHYSIOLOGY-I
Subject Code: BPT-102
Minimum Hours: Theory-60 Hrs., Practical-60 Hrs.

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

COURSE LEARNING OUTCOMES: The student will be able to

1. Describe physiology of blood.
2. Discuss nerve-muscle physiology.
3. Define and describe physiological functions of cardio vascular and respiratory system.
4. Define and describe physiological functions of Digestive system.
5. Define and describe physiological functions of Endocrine system.

THEORY

Topics to be covered

1. General Physiology

- Cell: morphology, Structure and function of cell organelles
- Structure of cell membrane
- Transport across cell membrane
- Intercellular communication
- Homeostasis

2. Blood

- Introduction-composition & function of blood
- W.B.C., R.B.C., Platelets formation & functions, Immunity
- Plasma: composition, formation & functions, Plasma Proteins:-types & functions
- Blood Groups- types , significance, determination
- Hemoglobin
- Haemostasis
- Lymph-composition, formation, circulation & functions

3. Cardiovascular system

- Conducting system-components, impulse conduction
- Heart valves
- Cardiac cycle- definition, phases of cardiac cycle
- Cardiac output- definition, normal value, determinants. Stroke volume and its regulation
- Heart rate and its regulation
- Arterial pulse, Blood pressure-definition, normal values, factors affecting blood pressure
- Shock-definition, classification, causes and features
- Basic idea of ECG
- Cardiovascular changes during exercise

4. Respiratory System

- Mechanics of respiration
- Lung volumes and capacities
- Pulmonary circulation, transport of respiratory gases
- Factors affecting respiration
- Regulation of respiration-neural regulation, voluntary control and chemical regulation
- Hypoxia, Hypercapnoea, Hypocapnoea
- Artificial respiration
- Disorders of respiration- dyspnoea, orthopnoea, hyperpnoea, hyperventilation, apnoea, tachypnoea
- Respiratory changes during exercise.

5. Nerve Muscle Physiology

- Muscles- classification, structure, properties, Excitation contraction coupling
- Motor unit, EMG, factors affecting muscle tension,
- Muscle tone, fatigue, exercise
- Nerve –structure and function of neurons, classification, properties
- Resting membrane potential & Action potential their ionic basis
- All or None phenomenon
- Neuromuscular transmission

PRACTICAL

COURSE OBJECTIVES: The course in Physiology is designed to give the student an in-depth knowledge of fundamental reactions of living organisms, particularly in the human body.

COURSE LEARNING OUTCOMES: At the end of the course, the candidate will be able to

1. Demonstrate procedures to determine hematology findings.
2. Recognize the abnormalities in the hematology findings.

Topics to be covered:

Practical classes include hematology experiments, clinical examinations, amphibian chart, and recommended demonstrations.

1. Haematology: To be done by the students

a. Study of Microscope and its uses

b. Determination of RBC count

c. Determination of WBC count

d. Differential leukocyte count

e. Estimation of hemoglobin

f. Calculation of blood indices

g. Determination of blood groups

h. Determination of bleeding time

i. Determination of clotting time

Demonstrations only

j. Determination of ESR

k. Determination of PCV

2. Clinical Examination

a. Examination of Radial pulse.

b. Recording of blood pressure

c. Examination of CVS

d. Examination of Respiratory system

3. Amphibian Experiments – Demonstration and Dry charts Explanation.

a. Normal cardiogram of amphibian heart.

i. Properties of Cardiac muscle

ii. Effect of temperature on cardiogram.

4. Recommended Demonstrations

a. Spirometry

b. Artificial Respiration

c. ECG

d. Perimetry

CLINICAL BIOCHEMISTRY

Subject Code: BPT-103

Minimum Hours: 80 Hrs.

COURSE OBJECTIVES: This course provides the knowledge and skills in fundamental organic chemistry and introductory biochemistry that are essential for further studies. It covers basic biochemical, cellular, biological and microbiological processes, basic chemical reactions in the prokaryotic and eukaryotic cells, the structure of biological molecules, introduction to the nutrients i.e. carbohydrates, fats, enzymes, nucleic acids and amino acids.

COURSE LEARNING OUTCOMES: At the end of the course, the candidate will be able to –

1. Describe structures & functions of cell in brief.
2. Describe biochemistry of connective tissues.
3. Discuss acid base balance.
4. Define nutrition, balance diet & nutritional disorders.
5. Describe Nucleotide and Nucleic acid Chemistry
6. Discuss role of enzymes.
7. Describe Carbohydrate Chemistry, Amino-acid Chemistry & Vitamins.
8. Discuss Carbohydrate Metabolism, Lipid Metabolism, Amino acid and Protein Metabolism.

THEORY

Topics to be covered:

1. Nutrition: RDA, BMR, SDA, caloric requirement and balanced diet.
2. Carbohydrates: Definition, classification and general functions. Carbohydrate Metabolism - Glycolysis, T.C.A cycle.
3. Lipids: Definition, classifications and general functions. Essential fatty acids and their importance, Cholesterol, Lipoproteins. Metabolism-□□Oxidation of fatty acids, fatty liver and ketosis.
4. Amino Acids : Definition, classification, essential and non essential amino acids.
5. Proteins: Definition, classification, and Bio-medical Importance. Metabolism: Formation and fate of ammonia, Urea cycle and its significance.
6. Study of hemoglobin and myoglobin with their functions.
7. Enzymes: Definition, classification with examples, Factors affecting enzyme action, isoenzyme and co-enzyme, Clinical importance of enzymes.
8. Biochemistry of connective tissue - Introduction, various connective tissue proteins : collagen, elastin- structure and associated disorders.
9. Vitamins: Definition, classification and functions, dietary source, daily requirement and deficiency disorders.
10. Diabetes mellitus - definition, types & causes.
11. Bio medical waste management:-
 - a. Definition of Biomedical Waste
 - b. Waste minimization
 - c. BMW – Segregation, collection, transportation, treatment and disposal (including color coding)
 - d. Liquid BMW, Radioactive waste, Metals / Chemicals / Drug waste
 - e. BMW Management & methods of disinfection
 - f. Modern technology for handling BMW
 - g. Use of Personal protective equipment (PPE)
 - h. Monitoring & controlling of cross infection (Protective devices)

HEALTH PSYCHOLOGY
Subject code: BPT-104
Min. Hours: 80 Hrs.

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

COURSE LEARNING OUTCOMES: At the end of the course, the candidate will able to:

1. Define psychology of attention, perception and motivation.
2. Describe causes and management of frustration and conflict.
3. Discuss about intelligence, thinking and learning.
4. Describe personality and methods to assess personality.
5. Classify and describe social psychology and clinical psychology.
6. List importance of psychology in physiotherapy management of patients

THEORY

Topics to be covered:

1. Introduction to Psychology, Fields of application of Psychology, influence of heredity and environment on the individual.
2. Learning – theories and principles of learning, Learning disabilities.
3. Memory – types, theories of memory and forgetting, methods to improve memory.
4. Thinking – process of thinking, problem solving, decision making and creative thinking.
5. Motivation - theories and types of Motivation.
6. Emotions - theories of emotions and stress, Emotional and behavioral disorders of childhood and adolescence, Disorders of under and over controlled behavior, Eating disorders.
7. Attitudes – theories, attitudes and behavior, factors in attitude change.
8. Intelligence - theories of intelligence, I.Q., general intelligence and special intelligence, intelligence tests and their uses.
9. Personality, theories of personality, factors influencing personality, Personality Disorders.
10. Conflict and frustration - Common defensive mechanism : Identification, regression, repression, projection, sublimation and rationalization.
11. Attention and Perception : Nature of attention, factors determining attention, nature of perception, principle of perceptual grouping; illusions and Hallucination.
12. Counseling - Aims and principles.
13. Development and growth of behavior in infancy and childhood, adolescence, adulthood and old age, normal and abnormal.
14. Psychotherapy – introduction to paradigms in psychopathology and therapy.
15. Mental deficiency -
 - a) Mental retardation.
 - b) Autistic behavior
 - c) Learning disabilities.

Bachelor of Physiotherapy (BPT)-II Semester

ANATOMY-II

Subject code: BPT-201

Minimum hours: Theory-60 Hrs., Practical-60 Hrs.

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

COURSE LEARNING OUTCOMES: The student will be able to –

1. Describe anatomy of lower quadrant including spine, pelvis and lower extremities: list bones, joints, soft tissues, muscles related to musculoskeletal system of spine & lower extremities and to localize various surface land-marks, apply related radiological and living anatomy
2. Describe anatomy of structures of head, face and neck
3. Describe and outline various parts of nervous system: Source, course & components of various trans-sections of spinal tracts and C.N.S; Source, course & components of various trans-sections of brain, cranial nerves (Special emphasis to III, IV, V, VI and VII) and peripheral nerves.
4. Describe blood circulation of C.N.S. & spinal cord.
5. Describe the course of peripheral nerves.
6. Discuss anatomical basis of clinical conditions of nervous system.
7. Demonstrate movements of lower extremity joints – Identify & describe the origin/insertion, nerve /blood supply, root value & function of various skeletal muscles (including lower extremity and spine).

THEORY

TOPICS TO BE COVERED:

1. Nervous system

- Classification of nervous system
- Nerve – structure, classification, microscopy with examples.
- Neurons, classification with examples. Simple reflex arc.
- Parts of a typical spinal nerve/Dermatome
- Central nervous system – disposition, parts and functions
- Cerebrum
- Cerebellum
- Midbrain & brain stem
- Blood supply & anatomy of brain
- Spinal cord- anatomy, blood supply, nerve pathways
- Pyramidal, extra pyramidal system
- Thalamus, hypothalamus
- Structure and features of meninges
- Ventricles of brain, CSF circulation
- Development of nervous system & defects
- Cranial nerves – (course, distribution, functions and palsy)
- Sympathetic nervous system, its parts and components
- Parasympathetic nervous system
- Applied anatomy

2. Sensory system

- Structure and function of
 - Visual system
 - Auditory system
 - Gustatory system
 - Olfactory system
 - Somato sensory system

3. Cardiovascular system

- Circulatory system – major arteries and veins of the body, structure of blood vessels
- Heart structure, positions, chambers, valves, internal & external features
- Blood supply to heart

- Conductive system of heart
- 4. Lymphatic system
 - Circulation, structure & functions
 - Lymph nodes
- 5. Respiratory system
 - Structure of upper and lower respiratory tract
- Thorax:
 - Pleural cavities & pleura
 - Lungs and respiratory tree
 - Heart and great vessels
 - Diaphragm
- 6. Digestive system
 - Parts of digestive system
 - Abdominal cavity – divisions
 - Muscles of abdominal wall
 - Liver
 - Pancreas
 - Spleen
 - Alimentary canal
 - Gall bladder
 - Intestine (small & large)
- 7. Urinary and Reproductive system
 - Urinary system
 - Pelvic floor, innervations
 - Kidney, Ureter, bladder, urethra
 - Genital system – male and female
 - Reproductive system of male
 - Reproductive system of female
- 8. Endocrine system
 - Pituitary gland
 - Thyroid
 - Parathyroid

PRACTICAL

COURSE OBJECTIVES: Studies are concerned with the topographical and functional anatomy of the limbs and Nervous system

COURSE LEARNING OUTCOMES: The student will be able to –

1. Identify and list bones, joints, soft tissues, muscles related to musculoskeletal system of spine & lower extremities and to localize various surface land-marks, apply related radiological and living anatomy
2. Identify structures of head, face and neck
3. Identify source, course & components of various trans-sections of spinal tracts and C.N.S; Source, course & components of various trans-sections of brain, cranial nerves (Special emphasis to III, IV, V, VI & VII) & peripheral nerves.
4. Demonstrate movements of upper extremity joints – Identify & describe the origin/insertion, nerve /blood supply, root value & function of various skeletal muscles, course of peripheral nerves.
5. Demonstrate movements of lower extremity joints – Identify & describe the origin/insertion, nerve /blood supply, root value & function of various skeletal muscles (including lower extremity and spine), course of peripheral nerves.

TOPICS TO BE COVERED:

1. Demonstration of dissected parts (abdominal viscera, face and brain).
2. Demonstration of skeleton- articulated and disarticulated.
3. During the training more emphasis will be given on the study of CNS, PNS, Cardiovascular System, Respiratory System, Digestive System, Urinary System bones & reproductive system muscles, joints, nerve supply of the limbs and arteries of limbs.
4. Audio visual material for practical study of related anatomical parts.
5. Demonstration on Anatomical models

6. Students visit to Anatomy Museum

PHYSIOLOGY-II
Subject Code: BPT-202
Minimum Hours: Theory-60 Hrs., Practical-60 Hrs.

COURSE OBJECTIVES: The course in Physiology is designed to give the student an in-depth knowledge of fundamental reactions of living organisms, particularly in the human body.

COURSE LEARNING OUTCOMES: At the end of the course student will be able to:

1. Describe physiology of special senses.
2. Discuss Exercise physiology.
3. Define and describe physiological functions of Nervous system. .
4. Define and describe physiological functions of renal system.
5. Define and describe physiological functions of Reproductive system.

THEORY

TOPICS TO BE COVERED:

1. Nervous system

- Introduction, central and peripheral nervous system, functions of nervous system
- Reflexes- monosynaptic, polysynaptic, superficial, deep & withdrawal reflex
- Sense organ, receptors, electrical & chemical events in receptors
- Sensory pathways for touch, temperature, pain, proprioception & others
- Control of tone & posture: Integration at spinal, brain stem, cerebellar, basal ganglion levels, along with their functions
- Motor mechanism: motor cortex, motor pathway: the descending tracts- pyramidal & extra pyramidal tracts- origin, course, termination & functions. Upper motor neuron and lower motor neuron paralysis.
- Spinal cord lesions- complete transection & hemisection of the spinal cord
- Autonomic nervous system : features and actions of parasympathetic & sympathetic nervous system
- Hypothalamus
- Higher functions of nervous system
- Special senses- eye, ear, nose, mouth

2. Renal System

- Physiology of kidney and urine formation
- Glomerular filtration rate, clearance, Tubular function
- Water excretion, concentration of urine- regulation of Na^+ , Cl^- , K^+ excretion
- Physiology of urinary bladder

3. Digestive System

- Digestion & absorption of nutrients
- Gastrointestinal secretions & their regulation
- Functions of Liver & Stomach.

4. Endocrinology

- Physiology of the endocrine glands – Pituitary, Pineal Body, Thyroid, Parathyroid, Adrenal, Gonads, Thymus, Pancreas. Hormones secreted by these glands, their classifications and functions.

5. Male & female reproductive system

- Male - Functions of testes, pubertal changes in males, testosterone - action & regulations of secretion.
- Female - Functions of ovaries and uterus, pubertal changes, menstrual cycle, estrogens and progesterone - action and regulation.

PRACTICAL

COURSE OBJECTIVES: The course in Physiology practical is designed such that the students should be able to determine the basic procedures to examine various physiological functions of human body.

COURSE LEARNING OUTCOMES: At the end of the course, the candidate will be able to:

1. Demonstrate procedures to determine pulses and blood pressure.
2. Demonstrate procedures to examine sensory system & motor system
3. Demonstrate procedures to examine respiratory system & cardio vascular system.

Recognize the abnormalities in the ECG and spirometry findings.

1. Clinical Examination

a. Examination of Sensory system

b. Examination of Motor System

c. Examination of reflexes

d. Examination of cranial nerves

Yoga-Basic Theory Science and Techniques
Subject Code: BPT-203
Minimum Hours: Theory-40 Hrs., Practical-40 Hrs.

COURSE LEARNING OUTCOMES: By the end of the course the students able to:

1. Describe the basics of yogic Sciences
2. Describe the yoga various postures
3. Demonstrate the yoga postures
4. Apply yoga techniques for clinical condition

THEORY

TOPICS TO BE COVERED:

1. Foundations of Yoga (5 hours)
 - a. Introduction to Yoga and its philosophy
 - b. Brief history, development of Yoga
 - c. Philosophical foundations of Yoga
 - d. Streams & types of Yoga
 2. Yoga and Health (5 hours)
 - a. Concept of body in yoga – Panchakosha theory
 - b. Concept of Health and Disease in yoga
 - c. Stress management through yoga
 - d. Disease prevention and promotion of positive health through yoga
 3. Physiological effects of Yoga practices
 - a. Physiological effects of Shat kriyas
 - b. Physiological effects of Asanas
 - c. Physiological effects of Pranayamas
 - d. Physiological effects of Relaxation techniques and Meditation
- Yogic Management of**
- (i) Common Ailments
 - (ii) Respiratory disorders
 - (iii) Cardiovascular disorders
 - (iv) Endocrine & metabolic disorders
 - (v) Obstetric & Gynaecological disorders
 - (vi) Gastrointestinal disorders
 - (vii) Cancer
 - (viii) Musculoskeletal disorders
 - (ix) Neurological disorders
 - (x) Psychiatric disorders

PRACTICAL

COURSE LEARNING OUTCOMES: By the end of the course the students able to:

1. Describe the basics of yogic Sciences
2. Describe the yoga various postures
3. Demonstrate the yoga postures
4. Apply yoga techniques for clinical condition

TOPICS TO BE COVERED:

- List of Practical / Demonstrations (30 hours)
1. Sukshma Vyayama/Sithilikarna Vyayama and Surya Namaskar: (3 hours)
 - a. Loosening exercises of each part of the body particularly of the joints
 - b. 12 step Surya namaskar with prayer and specific mantras
 2. Yogic kriyas [Observation/ demonstration only] (3 hours)
 - a. Neti (Jala Neti, Sutra Neti)
 - b. Dhauti (Vamana Dhauti, Vastra Dhauti)
 - c. Trataka
 - d. Shankaprakshalana (Laghu & Deergha)
 3. Yogasanas
 - a. Standing postures (4 hours)
 - i. Tadasana (Upward stretch posture)
 - ii. Ardha Chakrasana (Half wheel posture)
 - iii. Ardha Katicakrasana (Half lumber wheel posture)

- iv. Utkatasana (Chair posture)
- v. Pada Hastasana (Hand to toes posture)
- vi. Trikonasana (Triangle posture)
- vii. Parshva Konasana (Side angle posture)
- viii. Garudasana (Eagle posture)
- ix. Vrikshasana (Tree posture)
- b. Prone positions (4 hours)
- i. Makarasana (Crocodile posture)
- ii. Bhujangasana (Cobra posture)
- iii. Salabhasana (Locust posture)
- iv. Dhanurasana (Bow posture)
- v. Naukasana (Boat posture)
- vi. Marjalarasana (Cat posture)
- c. Supine postures (4 hours)
- i. Ardha halasana/ Uttana Padasana
- ii. Sarvangasana (All limb posture)
- iii. Pawana mukatasana (Wind releasing posture)
- iv. Matsyasana (Fish posture)
- v. Halasana (Plough posture)
- vi. Chakrasana (Wheel posture)
- vii. Setu Bandhasana (Bridge posture)
- viii. Shavasana (Corpse posture)
- d. Sitting postures (4 hours)
- i. Parvatasana (Mountain posture)
- ii. Bhadrasana (Gracious posture)
- iii. Vajrasana (Adamantine posture)
- iv. Paschimottanasana (Back stretching posture)
- v. Janushirasana (Head to knee posture)
- vi. Simhasana (Lion posture)
- vii. Gomukhasana (Cow head posture)
- viii. Ushtrasana (Camel posture)
- ix. Ardha Matsyendrasana (Half matsyendra spine twist posture)
- x. Vakrasana (Spinal twist posture)
- xi. Kurmasana (Turtle posture)
- xii. Shashankasana (Rabbit posture)
- xiii. Mandukasana (Frog Posture)
- e. Meditative postures and Meditation techniques (2 hours)
- i. Siddhasana (Accomplished pose)
- ii. Padmasana (Lotus posture)
- iii. Samasana
- iv. Swastikasana (Auspicious posture)
- 4. Pranayamas (4 hours)
- a. The practice of correct breathing and Yogic deep breathing
- b. Kapalabhati
- c. Bhastrika
- d. Sitali
- e. Sitkari
- f. Sadanta
- g. Ujjayi
- h. Surya Bhedana
- i. Chandra Bhedana
- j. Anuloma-Viloma/Nadishodana
- k. Bhramari
- 5. Relaxation Techniques (2 hours)
- a. Shavasana
- b. Yoga Nidra

FIRST AID AND EMERGENCY CARE
Subject Code : BPT - 204
Min. Hours: 80 Hrs.

THEORY

Introduction of First Aid

Definition, aims and importance of First Aid.
Rules/General Principles of First Aid
Concepts of Emergency.

Procedure and Techniques in First Aid

Preparation of First Aid kit, Dressing bandaging and splinting
Transpiration of injured patient
CPR-Mouth to mouth, Sylvester, Schafer, External Cardiac Massage

First Aid in Emergency

Asphyxia, Drowning, Shock
Wound and bleeding, Injuries of the Soft and dense tissue
Injury of joint and bone, Falls, Hanging
Foreign body ear, ear and nose and throat
Burns and Scalds
Poisoning – Ingestion, inhalation, bite and stings

Assessing a Casualty and vital parameters

Assessing the sick or injured, Mechanisms of injury
Primary Survey, Secondary survey
Head-to-toe examination, monitoring vital signs

Emergency Management

Principle of Emergency care
Triage
Airways obstruction, Basic knowledge of First Aid and management of burn
Basic Knowledge of First Aid for medical and Surgical emergency
Basic knowledge of first aid management of heat stroke
Basic knowledge of first aid management of snake bite and poisoning
Unconscious adult, Unconscious child, Unconscious infant, How to use an AED

Techniques and Equipment

Removing clothing, removing headgear, casualty handling, First Aid materials, Dressing, Cold compresses, Principles of bandaging, Roller bandages, Tubular gauze bandages, square knots, hand and foot cover, Arm sling, Elevation sling, improvised slings.

BLS and ACLS

BLS guideline for adult and paediatrics
CPR techniques, choking
ACLS basic guidelines

Bachelor of Physiotherapy (BPT) –III Semester

BASIC PRINCIPLES OF BIOMECHANICS

Subject Code: BPT-301

Min. Hrs: Theory- 40 Hrs., Practical –40 Hrs.

THEORY

COURSE OBJECTIVES: Biomechanics involves the study of basic concepts of human movement, and application of various biomechanical principles in the evaluation and treatment of disorders of musculoskeletal system. Students are taught to understand the various quantitative and qualitative methods of movement. Mechanical principles of various treatment methods are studied. Study of posture and gait are also included.

COURSE LEARNING OUTCOMES: At the end of the course student will be able to:

1. Define and describe basic concepts in Biomechanics.
2. Classify joints and describe joint structures & its functions.
3. Discuss biomechanics of movements at joints related to planes and axis.
4. Classify muscle and describe muscle structures & its functions.
5. Discuss biomechanics of muscle related to force production.
6. Describe Biomechanics of the Thorax and Chest wall.
7. Describe Biomechanics of The Temporo mandibular Joint.
8. Describe Biomechanics of vertebral column.

Topics to be covered:

1. Mechanics - Definition of mechanics and Biomechanics
2. Motion: definition, types of motion, plane and axis of motion, factor determining the kind and modification of motion.
3. Force - Definition, diagrammatic representation of force, point of application, classification of forces, concurrent, coplanar and co-linear forces, composition and resolution of forces, angle of pulls of muscle
4. Friction
5. Gravity - Definition, line of gravity, Centre of gravity
6. Equilibrium - Supporting base, types, and equilibrium in static and dynamic state
7. Levers - Definition, function, classification and application of levers in physiotherapy & order of levers with example of lever in human body
8. Pulleys - system of pulleys, types and application
9. Elasticity - Definition, stress, strain, HOOKE'S Law
10. Springs - properties of springs, springs in series and parallel, elastic materials in use
11. Muscular system
12. Definition, properties of muscle, muscular contraction, structural classification, action of muscle in moving bone, direction of pull, angle of pull, functional classification, coordination of muscular system.

PRACTICAL

1. Goniometry – measurement of joint ROM
2. Identify Muscle work of various movements in body at different angle.
3. Demonstration of different type of anatomical pulleys and levers of body.
4. Demonstration of various movements of all joints of the body.

EXERCISE THERAPY - I
Subject Code: BPT-302
Min. Hrs. : Theory - 60 Hrs., Practical - 60 Hrs.

COURSE OBJECTIVES - In this course, the students will learn the principles and effects of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions.

COURSE LEARNING OUTCOMES: At the end of the course, the candidate will be able to:

1. Define principle of exercise applications.
2. Describe methods of testing – goniometry, manual muscle testing
3. Anthropometric Measurements, Measurement of Limb Length and functional tests.
4. Classify and describe active movements and passive movements.
5. Define and describe free exercises and resisted exercises.
6. Describe relaxation techniques.
7. Define and describe therapeutic massage.

THEORY

TOPICS TO BE COVERED:

1. Introduction to exercise therapy
2. Mechanical principle applied in human body – gravity, centre of gravity, line of gravity, base of support, equilibrium, axis and planes
3. Disability models – ICIDH model of disability, Nagi model of disability, ICF model
4. Exercise physiology – effect of exercise in various systems – musculoskeletal, neuromuscular, cardiovascular, respiratory system
5. Movements
6. Passive movements – definition, classification, indications, contra indications, advantages, limitations, techniques - emphasize PROM to upper, lower, neck and trunk muscles
7. Active movements - definition, classification, indications, contra indications, advantages, limitations, techniques - emphasize active movements to upper, lower, and neck and trunk muscles
8. Starting positions – muscle work, effect and uses and derived positions
9. Relaxation – definition, types of relaxation, relaxation techniques
10. Suspension – definition, types, uses and therapeutic applications
11. Balance – static and dynamic balance, mechanism of balance control, balancing exercises
12. Neuromuscular coordination – causes of in coordination, exercises to improve coordination – Frenkle exercise
13. Joint range measurement – Goniometer, types and techniques of measuring joint ROM
14. Measurement of limb length, girth
15. Manual muscle testing – grading system, techniques- emphasize on skill to grade upper, lower, neck and trunk muscles.
16. Mobility aids – crutches, canes, walker
17. Soft tissue manipulation (massage) – history, types, techniques, physiological effects, therapeutic uses, contraindications

PRACTICAL

COURSE OBJECTIVES - In this course, the students will learn the principles and effects of exercise as a therapeutic modality and will learn the techniques in the restoration of physical functions.

COURSE LEARNING OUTCOMES: At the end of the course student will be able to:

1. Demonstrate passive movements in terms of various Anatomical planes.
2. Demonstrate various starting and derived positions.
3. Acquire a skill of assessment of sensations, superficial and deep reflexes,
4. pulse rate/ Blood pressure, Chest expansion/ respiratory rate, and
5. Limb length/ girth measurement on Models.
6. Demonstrate the skills of relaxation.
7. Demonstrate the skill of measuring ROM with goniometer.
8. Demonstrate techniques of Massage Therapy & Soft Tissue Manipulations.

TOPICS TO BE COVERED:

1. Starting positions and derived positions
2. Range of motion (PROM, AROM, AAROM) exercises to all joints
3. Measurement of joint range using goniometer
4. General and local Relaxation techniques
5. Suspension exercise to all major joints
6. Massage – upper limb, lower limb, back, face
7. Manual muscle testing of individual muscles
8. Coordination exercises, balancing exercises

ELECTRO THERAPY – I
Subject Code: BPT-303
Min. Hrs. : Theory - 60 Hrs., Practical - 60 Hrs.

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

COURSE LEARNING OUTCOMES: At end of course candidate will be able to:

1. Describe the types of currents
2. Describe the electro diagnosis.
3. Describe the about modalities of heat
4. Describe the application of electrotherapy.

THEORY

TOPICS TO BE COVERED:

1. Basic components of electric current – electrons, protons, neutrons, ions, matter, molecules
2. Current electricity – static electricity, electric charge, conductors, conduction of electricity, resistance, factors effecting resistance with example in human body, insulation, unit of electric current – ampere, coulomb, volt, ohms law
3. Magnetism, theories of magnetism, properties of magnet.
4. Electromagnetic induction, electromagnetic radiation, laws governing radiations – Grouth's law, cosine law, inverse square law, law of reflection, rarefaction.
5. Electrical components – transformer, capacitor, diode, valves
6. Types of electric current, wave forms, current modulation – continuous, burst, beat, surge. Electric circuit in parallel and series.
7. Safety issues while using electrical equipments – for patients and therapist
8. Muscle and nerve response to electrical stimulation – polarization, depolarization and propagation of impulse.
9. Pain – types of pain, pain pathway, theories of pain, Gate control theory of pain, pain modulation at various levels.
10. Low frequency currents:
 - a. Neuromuscular electrical stimulation – physiological effects, therapeutic uses of electrical stimulation techniques – electrodes type, electrode size, electrode placement, stimulating points, methods of reducing skin electrode resistance, contraindications and precautions.
 - b. High voltage pulsed stimulation.
 - c. Russian stimulation.
 - d. Trans cutaneous Electrical Nerve stimulation (TENS) – therapeutic uses of TENS, types, electrode placement in TENS, contraindications and precautions
 - e. Iontophoresis – mechanism, biophysical effect, medication dosage, medicated ions used, techniques of application.
11. Electro diagnostic test – FG test, strength duration curve, chronaxie, reobase
12. Interferential therapy (IFT) – physiological effects, therapeutic indications, methods of application, sweep, base, contraindication and precautions.

PRACTICAL

COURSE OBJECTIVE: The student of Electrotherapy must be able to demonstrate the use of electrotherapy modalities applying the principles of electrotherapy with proper techniques, choice of dosage parameters and safety precautions.

COURSE LEARNING OUTCOMES: At the end of this course candidate able to:

1. Demonstrate electrical stimulation
2. Demonstrate SWD & UST application
3. Demonstrate superficial heat modalities
4. Demonstrate checking of electrical equipments.

TOPICS TO BE COVERED:

1. Identify basic electrical components in electrotherapeutic equipments.
2. Reading of medical records, identifying indications and contraindications for electrotherapy.
3. Stimulation of motor points, stimulation of individual muscle and group muscle
4. Faradic foot bath, Faradism under pressure.
5. Plotting SD graph, diagnosis using electro diagnostic test – FG test and SD curve.
6. Placement of electrodes in TENS & IFT with dosimeter for various indications.

PATHOLOGY
Subject Code: BPT-304
Min. Hrs. : Theory – 80 Hrs.

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

COURSE LEARNING OUTCOMES: At the end of the course, the candidate will be able to:

1. Define cell injuries.
2. Describe inflammation and wound healing.
3. Discuss about immuno pathology.
4. Describe pathology of infectious diseases.
5. Describe Growth Disturbances and Neoplasia.
6. Explain pathology of Nutritional Disorders and genetic disorders.
7. Describe the pathology of various systems of human body

THEORY

TOPICS TO BE COVERED:

1. Introduction to Pathology

2. Cell injuries:

- Aetiology and Pathogenesis with a brief recall of important aspects of normal cell structure.
- Reversible cell injury: Types, Sequential changes, Cellular swellings, vacuolation, Hyaline changes, Mucoid changes.
- Irreversible cell injury: Types of Necrosis & Gangrene, Autolysis.
- Pathologic calcification: Dystrophic and Metastatic. Intracellular Accumulations.

3. Inflammation and Repair

- Acute inflammation: features, causes, vascular and cellular events, Inflammatory cells and Mediators.
- Chronic inflammation: Causes, Types, Classification nonspecific and granulomatous with examples.
- Repair, Wound healing by primary and secondary union, factors promoting and delaying the process. Healing in specific site including bone healing.

4. Circulatory Disturbances

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

5. Growth Disturbances and Neoplasia

- Atrophy, Hypertrophy, Hyperplasia, Aplasia, Hypoplasia, dysplasia. Precancerous lesions.
- Neoplasia: Definition, classification, Biological behaviour: Benign and Malignant (brief idea), Carcinoma and Sarcoma.

6. Hematology

- Constituents of blood and bone marrow, Regulation of hematopoiesis.
- Anemia: Classification, clinical features & lab diagnosis (brief idea).

- Hemostatic disorders, Vascular and Platelet disorders & lab diagnosis.
- Coagulopathies - (i) Inherited (ii) Acquired with lab diagnosis.
- Leukocytic disorders: Leukocytosis, Leukopenias, Leukemoid reaction.
- Leukemia: Classification, clinical manifestation, pathology and Diagnosis(brief idea).

7. Respiratory System

- Pneumonia, Bronchitis, Bronchiectasis, Asthma, Tuberculosis, Carcinoma of lungs, Occupational lung diseases

8. Cardiovascular Pathology

- Congenital Heart diseases: Atrial septal defect, Ventricular septal defect, Fallot's tetralogy, Patent ductus arteriosus, Endocarditis, Rheumatic Heart disease.
- Vascular diseases: Atherosclerosis, Monckeberg's medial calcification.
- Ischemic heart Disease: Myocardial infarction.

9. Hepato Biliary Pathology

- Jaundice: Types, aetio-pathogenesis and diagnosis.

10. Musculoskeletal System

- Osteomyelitis: acute, chronic, tuberculous, mycetoma
- Metabolic diseases: Rickets/ Osteomalacia, osteoporosis, Hyperparathyroidism, Paget's disease.
- Tumours Classification: Benign, Malignant, Metastatic and synovial sarcoma.
- Arthritis: Suppurative, Rheumatoid. Osteoarthritis, Gout, Tuberculous.

11. Endocrine pathology

- Non-neoplastic lesions of Thyroid: Thyrotoxicosis, myxedema,

12. Neuropathology

- Inflammations and Infections: TB Meningitis, Pyogenic Meningitis, viral meningitis and Brain Abscess, Tuberculosis, Cysticercosis.

13. Dermatopathology:

- Skin tumors: Squamous cell carcinoma, Basal cell carcinoma, Melanoma (brief idea)

14. Congenital Myopathy & myasthenia gravis

Bachelor of Physiotherapy (BPT) – IV Semester

BIOMECHANICS & KINESIOLOGY

Subject Code: BPT-401

Min. Hrs: Theory- 60 Hrs., Practical – 60 Hrs.

COURSE OBJECTIVES: This course supplements the knowledge of anatomy and enables the student to have a better understanding of the principles of biomechanics and their application in musculoskeletal dysfunction.

COURSE LEARNING OUTCOMES: At the end of the course student will be able to:

1. Describe Biomechanics of the shoulder complex.
2. Describe Biomechanics of the elbow Joint.
3. Describe Biomechanics of wrist joint and hand complex.
4. Describe Biomechanics of the hip Joint.
5. Describe Biomechanics of the knee and ankle complex.
6. Define and discuss biomechanical analysis of human gait.
7. Define and discuss biomechanical analysis of human posture.

THEORY

TOPICS TO BE COVERED:

1. Joint structures and functions:
 - i. Joint design, Structure of Connective Tissue, Properties of Connective Tissue, joint function, changes with disease, injury, immobilization, exercise, over use
 - ii. Structure and functions of upper extremity joints – shoulder complex, elbow complex, wrist and hand complex
 - iii. Structure and functions of lower extremity joints – hip joint, knee joint, ankle and foot complex
 - iv. Structure and functions of axial skeletal joints – vertebral column – craniocervical, thorax, lumbar, lumbo pelvic region
 - v. Structure and functions of temporomandibular joint
2. Posture – dynamic and static posture, kinetic and kinematics of posture, analysis of posture, effect of age, pregnancy, occupation on posture.
3. Gait – kinematics and kinetics of gait, gait in running and stair climbing.

PRACTICAL

COURSE OBJECTIVES: This course supplements the knowledge of anatomy and enables the student to have a better understanding of the principles of biomechanics and their application in musculoskeletal dysfunction.

COURSE LEARNING OUTCOMES: At the end of the course student will be able to:

1. Demonstrate movements of joints in all planes of movement. .
2. Identify missing component of movement.
3. Analysis posture and recognize presence of abnormality.
4. Analysis gait and recognize presence of abnormality.
5. Analysis activities of daily living and interpret the findings in functional activities.

TOPICS TO BE COVERED:

1. Goniometry – measurement of joint ROM
2. Identify Muscle work of various movements in body at different angle.
3. Identify normal and abnormal posture.
4. Normal gait with its parameters and identify abnormal gait with the problems in it.

ELECTROTHERAPY - II
Subject Code: BPT-402
Min. Hrs. : Theory – 60 Hrs., Practical – 60 Hrs.

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

COURSE LEARNING OUTCOMES: At end of course candidate will be able to:

1. Describe the types of currents
2. Describe the electro diagnosis.
3. Describe the about modalities of heat
4. Describe the application of electrotherapy.

THEORY

TOPICS TO BE COVERED:

1. Introduction to high frequency current, Electro Magnetic Spectrum
2. SWD: Define short wave, Frequency & Wavelength of SWD, Principle of Production of SWD, Circuit diagram & Production of SWD, Methods of Heat Production by SWD treatment, Types of SWD Electrode, Placement & Spacing of Electrodes, Tuning, Testing of SWD Apparatus, Physiological & Therapeutic effects, Indications & Contraindications, Dangers, Dosage parameters. Pulsed Electro Magnetic Energy
3. Micro Wave Diathermy: Define Microwave, Wave length & Frequency, Production of MW, Applicators, Dosage Parameters, Physiological & Therapeutic effects, Indications & Contraindications, Dangers of MWD.
4. Ultrasound: Define Ultrasound, Frequency, Piezo Electric effects: Direct, Reverse, Production of US, Treatment Dosage parameters: Continuous & Pulsed mode, Intensity, US Fields: Near field, Far field, Half value distance, Attenuation, Coupling Media, Thermal effects, Nonthermal effects, Principles & Application of US: Direct contact, Water bag, Water bath, Solid sterile gel pack method for wound. Uses of US, Indications & Contraindications, Dangers of Ultrasound. Phonophoresis: Define Phonophoresis, Methods of application, Commonly used drugs, Uses. Dosages of US.
5. IRR: Define IRR, wavelength & parameters, Types of IR generators, Production of IR, Physiological & Therapeutic effects, Duration & frequency of treatment, Indication & Contraindication.
6. UVR: Define UVR, Types of UVR, UVR generators: High pressure mercury vapour lamp, Water cooled mercury vapour lamp, Kromayer lamp, Fluorescent tube, Theraktin tunnel PUVA apparatus. Physiological & Therapeutic effects. Sensitizers & Filters. Test dosage calculation. Calculation of E1, E2, E3, E4 doses. Indications, contraindications. Dangers Dosages for different therapeutic effects, Distance in UVR lamp.
7. LASER: Define LASER. Types of LASER. Principles of Production. Production of LASER by various methods. Methods of application of LASER. Dosage of LASER. Physiological & Therapeutic effects of LASER. Safety precautions of LASER. Classifications of LASER Energy density & power density.
8. Wax Therapy: Principle of Wax Therapy application – latent Heat, Composition of Wax Bath Therapy unit, Methods of application of Wax, Physiological & Therapeutic effects, Indications & Contraindication, Dangers.
9. Contrast Bath: Methods of application, Therapeutic uses, Indications & Contraindications.
10. Moist Heat Therapy: Hydro collator packs – in brief, Methods of applications, Therapeutic uses, Indications & Contraindications.
11. Fluidotherapy: Construction, Method of application, Therapeutic uses, Indications & Contraindications.

12. Cryotherapy: Define- Cryotherapy, Principle- Latent heat of fusion, Physiological & Therapeutics effects, Techniques of Applications, Indications & Contraindications, Dangers, and Methods of application with dosage.
13. EMG and Nerve Conduction Velocity test, Biofeed back

PRACTICAL

COURSE OBJECTIVE: The student of Electrotherapy must be able to demonstrate the use of electrotherapy modalities applying the principles of electrotherapy with proper techniques, choice of dosage parameters and safety precautions.

COURSE LEARNING OUTCOMES: At the end of this course candidate able to:

1. Demonstrate electrical stimulation
2. Demonstrate SWD & UST application
3. Demonstrate superficial heat modalities
4. Demonstrate checking of electrical equipments.

TOPICS TO BE COVERED:

The student of Electrotherapy must be able to demonstrate the use of electrotherapy modalities applying the principles of electrotherapy with proper techniques, choice of dosage parameters and safety precautions.

1. Application of Ultrasound for different regions-various methods of application
2. Demonstrate treatment techniques using SWD, IRR and Microwave diathermy
3. Demonstrate the technique of UVR exposure for various conditions – calculation of test dose
4. Calculation of dosage and technique of application of LASER
5. Technique of treatment and application of Hydrocollator packs, cryotherapy, contrast bath, wax therapy

MICROBIOLOGY
Subject Code: BPT-403
Min. Hrs. : Theory – 80 Hrs., Practical - 40Hrs.

COURSE OBJECTIVES: Students will develop an understanding of pathology underlying clinical disease states and involving the major organ systems and epidemiological issues. Epidemiological issues will be presented and discussed. Students will learn to recognize pathology signs and symptoms considered red flags for serious disease. Students will use problem-solving skills and information about pathology to decide when referral to another health care provider or alternative intervention is indicated. Students will develop the ability to disseminate pertinent information and findings, and ascertain the appropriate steps to follow.

COURSE LEARNING OUTCOMES: At the end of the course student will be able to:

1. Define infection, routes of infection and spread.
2. Describe Sterilization, disinfection and universal precautions in relation to infection.
3. Discuss basic principles of immunity.
4. Describe general properties of bacteria and bacteriology.
5. Describe general properties of viruses and virology.
6. Describe general properties of fungi and mycology.
7. Discuss clinical microbiology.

THEORY

Topics to be covered:

1. Introduction & History of Microbiology
2. Classification of microorganism : Bacterial Morphology, cells structure, difference between prokaryotes & eukaryotes, capsule, flagella, fimbriae, pili, cell wall, plasma membrane, cytoplasm, ribosomes etc.
3. Bacteriology - Classification of Bacteria, Morphological characteristics of different bacteria.
4. Bacterial growth/Reproduction : Growth curve
5. Sterilization & disinfection :
 - a) Physical Methods
 - b) Chemical Methods
 - c) Mechanism of Sterilizations
 - d) Difference between sterilization and disinfection.
6. Modes of transmission of diseases
 - a) Various routes of spread of infection.
 - b) Hospital acquired infection.
 - c) Bacteria responsible for nosocomial infections
7. Bacterial diseases (in brief):
 - Mycobacterial diseases: Tuberculosis, Leprosy and Syphilis.
 - Bacterial disease: Pyogenic, Diphtheria, Gram negative infection, Bacillary dysentery.
8. Viral diseases (in brief) : Poliomyelitis, Herpes, Rabies, Measles, Ricktsia, Chlamydial infection, HIV infection.
9. Fungal diseases and opportunistic infections (in brief).
10. Food sanitation
 - a) Hygiene in restaurants & kitchens.
 - b) Health of food handlers & hygiene.
 - c) Disease caused by infected food & water.
11. Immunity
 - a) Active, passive
 - b) Natural, acquired
 - c) Antigen
 - d) Antibody, type of antibodies
 - e) Antigen antibody reactions.
 - f) Mechanism of immunity
 - g) Immunization.
12. AIDS - Aetiology, modes of transmission, diagnostic procedure.
13. Handling of infected material.

PRACTICAL

1. Preparation of smear.
2. Basic staining methods
3. Identification of bacteria on the basis of staining.
4. Basic knowledge of media and culture of bacteria.

5. Colony characteristics of common bacteria.

PHARMACOLOGY
Subject Code: BPT-404
Min. Hrs. : 80 Hrs.

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

COURSE LEARNING OUTCOMES: At the end of the course student will be able to:

1. Describe Pharmacological effects of commonly used drugs by patients referred for Physiotherapy, list their adverse reactions, precautions to be taken & contraindications, Formulation & route of administration.
2. Identify whether the pharmacological effect of the drug interferes with the Therapeutic response of Physiotherapy & vice-versa.
3. Indicate the use of analgesics & anti-inflammatory agents with movement disorders with consideration of cost, efficiency & safety for individual needs.
4. Get the awareness of other essential & commonly used drugs by patients-The bases for their use & common as well as serious adverse reactions.

THEORY

TOPICS TO BE COVERED:

1. General Pharmacology:
 - Introduction, Definitions, Classification of drugs, Sources of drugs, Routes of drug administration, Distribution of drugs, Metabolism and Excretion of drugs, Pharmacokinetics, Pharmacodynamics, Factors modifying drug response,
 - Elementary knowledge of drug toxicity, drug allergy, drug resistance, drug potency, efficacy & drug antagonism.
2. Autonomic Nervous system
 - General considerations – The Sympathetic and Parasympathetic Systems, Receptors, Somatic Nervous System
 - Cholinergic and Anti-Cholinergic drugs, Adrenergic and Adrenergic blocking drugs, Peripheral muscle relaxants.
3. Cardiovascular Pharmacology (in brief) :
 - Drugs Used in the Treatment of Heart Failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors
 - Antihypertensive Drugs: Diuretics, Beta Blockers, Calcium Channel Blockers, ACE Inhibitors, Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct acting Vasodilators
 - Antiarrhythmic Drugs
 - Drugs Used in the Treatment of Vascular Disease and Tissue Ischemia: Vascular Disease, Hemostasis Lipid-Lowering agents, Antithrombotics, Anticoagulants and Thrombolytics
 - Ischemic Heart Disease – Nitrates, Beta-Blockers, Calcium Channel Blockers
 - Cerebral Ischemia
 - Peripheral Vascular Disease
4. Neuropharmacology (in brief) :
 - Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines
 - Antianxiety Drugs: Benzodiazepines, Other Anxiolytics
 - Drugs Used in Treatment of Mood Disorders: Monoamine Oxidase Inhibitors, Tricyclic Antidepressants, Atypical Antidepressants, Lithium
 - Antipsychotic drugs
5. Disorders of Movement (in brief) :
 - Drugs used in Treatment of Parkinson's Disease
 - Antiepileptic Drugs
 - Spasticity and Skeletal Muscle Relaxants
6. Inflammatory/Immune Diseases-
 - Non-narcotic Analgesics and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs, Aspirin, Nonaspirin NSAIDs, drug Interactions with NSAIDs
 - Glucocorticoids: Pharmacological Uses of Glucocorticoids, adverse effects, Physiologic Use of Glucocorticoids
 - Drugs Used in Treatment of Arthritic Diseases: Rheumatoid Arthritis, Osteoarthritis, Gout
 - Drugs Used in the Treatment of Neuromuscular Immune/Inflammatory Diseases: Myasthenia gravis, Idiopathic Inflammatory Myopathies, systemic lupus Erythematosus, Scleroderma, Demyelinating Disease
7. Respiratory Pharmacology (in brief) : Obstructive Airway Diseases, Drugs used in Treatment of Obstructive airway Diseases, Allergic Rhinitis
8. Digestion and Metabolism (in brief):
 - Gastrointestinal Pharmacology: Peptic Ulcer Disease, Constipation, Diarrhea
 - Drugs Used in Treatment of Diabetes Mellitus: Insulin, Oral Hypoglycemics
9. Geriatrics:
 - Pharmacology and the geriatric Population: Adverse effects of special concern in the Elderly, Dementia, Postural hypotension, urinary incontinence.

Bachelor of Physiotherapy (BPT) –V Semester

EXERCISE THERAPY – II

Subject Code: BPT-501

Min. Hrs. : Theory – 60 Hrs., Practical – 60 Hrs.

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

COURSE LEARNING OUTCOMES: At the end of the course, the candidate will able to:

1. Define principle of Proprioceptive Neuromuscular Facilitation (PNF) and describe patterns, techniques of PNF.
2. Classify types of suspension and Describe methods of applying it.
3. Describe functional reeducation.
4. Define and describe Aerobic exercises.
5. Describe stretching techniques and classify the types of stretching.
6. Define principle of hydrotherapy and describe its various applications.
7. Describe mobilization of peripheral joints.
8. Discuss balance& coordination exercises.
9. Describe different walking aids and its uses.

THEORY

TOPICS TO BE COVERED:

1. **Joint mobilization:**
Definition – Mobilization, Manipulation, indications, limitations, contraindications and precautions, applications of Mobilization technique to various joints.
Principles of Maitland, Mulligan and Meckzi joint Manipulation techniques.
2. **Stretching:**
Definition, properties of soft tissue, mechanical and neurophysiological properties of connective tissue, mechanical properties of non contractile tissue. Determinants, type and effect of stretching, precautions, general applications of stretching technique.
3. **Resisted exercise:**
Definition – strength, power, endurance. Guiding principle of resisted exercise, determinants, types Manual and Mechanical Resistance Exercise, Isometric Exercise, Dynamic Exercise - Concentric and Eccentric, Dynamic Exercise - Constant and Variable Resistance, Isokinetic Exercise, Open-Chain and Closed-Chain Exercise, precautions, contraindications
Progressive Resistance Exercise - de Lormes, Oxford, MacQueen, Circuit Weight Training, Plyometric Training—Stretch-Shortening Drills, Isokinetic Regimens
4. **Proprioceptive Neuromuscular Facilitation – Principles, Diagonal patterns of movements, Basic procedures, Upper Extremity Diagonal patterns, Lower Extremity Diagonal Patterns. Technique in PNF – Rhythmic Initiation, Repeated Contractions, Reversal of Antagonists, Alternating Isometrics, Rhythmic Stabilization.**
5. **Aerobic Exercises – Definitions, Physiological response to Aerobic Exercise, Evaluation of aerobic capacity – exercise testing, Determinant of Aerobic Exercise, Physiological Changes with Aerobic Training, Aerobic Exercise Program, Applications of Aerobic Program in patients with chronic illness.**
6. **Hydrotherapy:**
Definitions, Goals and Indications, Precautions and Contraindications, Properties of water, Therapeutic Exercises in Hydrotherapy, Special equipments used.
7. **Balance training:**
Definition and Key terms, Balance control, Components of balance, Balance Impairment, Examination of Impaired Balance, Balance training Exercises.
8. **Posture:**
Normal Postural Control, Postural Alignment, Postural Stability, Postural Impairment and Mal-Alignment, Postural Training.
9. **Breathing Exercises:**

Aims and Goals of Breathing Exercises, Procedures of Diaphragmatic Breathing, Segmental Breathing, Pursed-Lip Breathing, Preventing and Relieving Episodes of Dyspnea, Positive Expiratory Pressure Breathing, Respiratory Resistance Training, Glossopharyngeal Breathing.

Exercises to mobilize the chest, Postural Drainage, Manual Technique used in Postural Drainage, Postural Drainage Positions, Modified Postural Drainage.

10. Gait Training:

Definition, Different methods of Gait Training, Gait Training in Parallel Bars, Walking Aids: Types: Crutches, Canes, Frames; Principles and training with walking aids.

11. Soft Tissue Injury:

General Description of Inflammation and repair, Acute, Sub Acute, and Chronic stage, General Treatment Guidelines.

12. Yoga: History, Introduction, Classification, Various Asana

PRACTICAL

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

COURSE LEARNING OUTCOMES: At the end of this course candidate able to:

1. Demonstrate PNF techniques.
2. Demonstrate Suspension therapy
3. Demonstrate mobilization of peripheral joints.
4. Demonstrate balance and coordination exercises.
5. Demonstrate usage of walking aids.
6. Demonstrate various techniques of stretching.

TOPICS TO BE COVERED:

1. Joint Mobilisation to individual joint
2. Stretching of individual and group muscles
3. Resisted exercises to individual and group muscles, open and closed kinematic exercises
4. PNF patterns to upper and lower limb.
5. Various types breathing exercises, chest mobilization exercises, postural drainage
6. Gait training with various walking aids

CLINICAL ORTHOPAEDICS AND TRAUMATOLOGY

Subject Code: BPT-502

Min. Hrs. : 80 Hrs

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

COURSE LEARNING OUTCOMES: The student will be able to

1. Discuss the Patho-physiology, clinical manifestations and conservative/surgical management of various traumatic cases of the musculoskeletal conditions
2. Describe the skill of clinical examination and interpretation of the pre-operative cases and post-operative cases
3. Discuss the investigation used in musculoskeletal conditions.
4. Discuss Pathological/biochemical studies pertaining to musculoskeletal conditions.
5. Identify the radiological findings with the clinical findings

THEORY

TOPICS TO BE COVERED:

1. Introduction to Orthopaedics:
An Orthopaedic patient, history taking, clinical features, clinical examination, and investigation (X- ray, CT scans, MRI scan, Bone scan)
2. Injuries of muscle & tendons : etiology & management.
3. Bony & Soft tissue injuries:
Injury & repair, Clinical presentation, evaluation & general principles of rehabilitation management, Tenosynovitis, Bursitis etc.
4. Fractures -
 - a. Types, Healing, complications, general principles of treatment.
 - b. Fracture of Spine, pelvis, hip joint, femur, patella, knee joint, cartilage and ligaments, tibia, fibula, ankle, calcaneum, metatarsals, calcicle, scapula, ribs, humerus, elbow joint, radius, ulna, scaphoid, metacarpals & phalanges.
 - c. Fracture separation of epiphysis.
5. Inflammation of bones & joints (Clinical features, evaluation, conservative & surgical management) -
 - a) Bones - Osteomyelitis- osteomyelitis - pyogenic & tubercular, osteoarthritis.
 - b) Joints - Rheumatoid arthritis, Juvenile Arthritis, Reiter's disease, Polymyalgia rheumatica, Gout, Ankylosing spondylitis, Neuropathic- joints, haemophilic arthropathy, Avascular necrosis.
6. Nutritional & metabolic diseases of bones :
Rickets, Osteomalacia & Osteoporosis.
7. Spine deformities:
Clinical features, diagnosis, management of Scoliosis, Kyphosis, Lordosis, Spondylosis, prolapse of intervertebral disc, cord compression, sacralization and traumatic deformities (paraplegia & quadriplegia).
8. Infections of Musculoskeletal system -
 - a. Bacterial infections
 - b. Tubercular infections, Leprosy, Pott's paraplegia
9. Congenital malformations (in brief description with outline of treatment):
 - a. Congenital Hip Displasia, Congenital Talipes Equinovarus / Calcaneo valgus, Arthrogyrosis Multiplex Congenita, Congenital Torticollis, Acromelia, phocomelia, Amelia,
 - b. Spina Bifida: all types, clinical presentation, sequel & management
10. Developmental diseases of skeleton:

Osteogenesis imperfecta, heterotopic ossification, Osteochondritis, Perthes' disease.

11. Neuromuscular diseases:

- a) Volkmann's Ischaemic contracture, obstetrical paralysis, and peroneal muscular atrophy
- b) Poliomyelitis – orthopaedic aspects and treatment of deformities.

12. Upper Limbs:

Clinical presentation, evaluation, conservative & surgical management of rotator cuff injuries, adhesive capsulitis, bursitis, biceps tendonitis, shoulder dislocation, snapping & winged scapula, tennis and golfer elbow, olecranon bursitis, soft tissue injuries, sprains and strains, Arthritic conditions, tenosynovitis, Carpal tunnel syndrome, wrist drop, claw hand, mallet finger, Dupuytren's contracture, reflex sympathetic dystrophy, common fractures and dislocations.

13. Lower Limb:

Clinical presentation, evaluation, conservative & surgical management of Arthritic conditions, soft tissue injuries, sprains and strains, achilles tendonitis, bursitis, plantar fasciitis, deformities, reflex sympathetic dystrophy, neuropathic Joints, common fractures and dislocations, pes cavus, pes valgus, hallus valgus footstrains, metatarsalgia, hallus rigidus, ingrowing toe nail.

14. Neuro-vascular Diseases :

Orthopaedic aspects and treatment of - Nerve injuries (major nerves), Plexus injuries

15. Amputations :

Justification, outline of surgical approaches, incisions, procedures, indications, contraindications, complications & management.

16. Bone tumors : benign & malignant (in brief)

17. Operations :

Reconstructive arthroplasty, arthodesis, bone grafting, osteotomy, tendon transplantation & transfer, nerve- neurolysis, suture, graft and decompression.

18. Orthopaedic splints and appliances.

19. Traction : Skin, skeleton (in brief).

20. Foot arches & their complications.

21. Rehabilitation of patients.

GENERAL MEDICINE INCLUDING PEDIATRICS & PSYCHIATRY

Subject Code: BPT – 503

Min. Hrs.: 80 Hrs.

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

COURSE LEARNING OUTCOMES: The student will be able to-

- 1 Describe Etiology, Pathophysiology, Signs & Symptoms & Management of the various Cardiovascular, Pulmonary, Gastro intestinal, Renal, Endocrinal, Metabolic, Geriatric & Nutrition Deficiency conditions
- 2 Describe Etiology, Pathophysiology, Signs & Symptoms, and Clinical Evaluation & Management of the various Psychiatry Conditions
- 3 Describe the principles of Management at the pediatrics conditions

THEORY

TOPICS TO BE COVERED:

1. Introduction:
Brief outline of subject of medicine, a medical patient, common signs & symptoms of disease
2. Infectious Diseases:
Brief description of concept of infection, types, classification & common clinical manifestation of infection and general principle of management
3. Nutritional & Metabolic Diseases:
Brief description of following diseases along with outline of management: Diabetes Mellitus, Vitamins (A, B, C, D & K) and Minerals (iron, calcium phosphorus, iodine) deficiencies, and Obesity
4. Alimentary tract:
Brief description of manifestations of alimentary tract disease & general principle of diagnosis & outline of management of following diseases: Peptic ulcer disease, common infections of small & large intestine
5. Brief description of liver diseases along with outline of management:
Hepatitis, & Jaundice
6. Diseases of connective tissues:
Brief description of manifestations along with outline of management of - SLE, polymyositis
7. Diseases of skin:
Brief description of manifestations along with outline of management of common skin diseases - scabies, pediculosis, taeniasis, impetigo & psoriasis
8. Geriatrics-
Physiology of ageing, manifestations of diseases in old people and general principles of management. Implications of aging in physical therapy. lung disease, Pleurisy & Pulmonary embolism
9. First Aid in common Medical Emergencies

PEDIATRICS

1. Normal Growth and development of child :
Motor, mental, language and social
2. Common infectious diseases in children:
Brief description of following infectious diseases along with outline of management: Tetanus, diphtheria, Mycobacterial, measles, chicken pox, gastroenteritis, HIV, and Malaria

3. Immunization programmes:
WHO schedule, different vaccinations, rationale; special consideration to various disease eradication programmes like Pulse-Polio
4. Child and nutrition :
Nutritional requirements, malnutrition syndrome, Vitamins (A, B, C, D & K) and Minerals (iron, calcium phosphorus, iodine) deficiencies in children and management in brief
5. Clinical presentation, management & prevention of the following :
Cerebral palsy, Poliomyelitis, Muscular dystrophy
6. Childhood rheumatism :
Types, clinical presentation, & management in brief
7. Acute CNS infections:
Clinical presentation, complications and management of bacterial and tubercular infections in brief
8. Clinical presentation, management & prevention of the following respiratory conditions:
URI, LRI, bronchiolitis, asthma, TB
9. Clinical presentation, management & prevention of the following cardiac conditions:
Rheumatic heart disease, SABA, Congenital heart disease - ASD, VSD, PDA

PSYCHIATRY

1. Modalities of psychiatric treatment
2. Psychiatric illness and physical therapy link
3. Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illnesses -
 - a. Anxiety neurosis
 - b. Depression
 - c. Obsessive compulsive neurosis
 - d. Psychosis- Définition & types
 - e. Maniac-depressive psychosis
 - f. Post-traumatic stress disorder
 - g. Psychosomatic reactions: Stress and Health, theories of Stress – Illness Link
4. Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illness
 - a. Drug dependence and alcoholism
 - b. Somatoform and Dissociate Disorders – conversion reactions, Somatization, Dissociate Amnesia, and Dissociate Fugue
 - c. Personality disorders
5. Child psychiatry:
Brief descriptions of manifestations, and management of childhood disorders - attention deficit syndrome, and behavioral disorders
6. Geriatric Psychiatry (in brief)

GENERAL SURGERY
Subject Code: BPT-504
Min. Hrs. : 80 Hrs.

COURSE OBJECTIVES: This subject follows the basic science subjects to provide the knowledge about relevant aspects of general surgery. The student will have a general understanding of the surgical conditions the therapist would encounter in their practice. The objective of this course is that after 60 hrs of lectures and discussion, the student will be able to list the indications for surgery, etiology, clinical features and surgical methods for various conditions

COURSE LEARNING OUTCOMES: The student will be able to-

1. Describe various surgical indications of abdominal, thoracic, neuro-surgical and peripheral vascular conditions
2. Describe surgical steps & Approaches in short and describe components of soft tissues
3. Recognize the post-operative complications and its implications in ward treatment, Prognosis, Morbidity and mortality
4. Describe effects of surgical trauma and anesthesia in post-operative course
5. Understand, classify, clinically assess, evaluate and describe surgical management in brief in:
 - i. Wounds and ulcers
 - ii. Burns
 - iii. Head injuries
6. Identify and interpret findings of x-ray chest and abdomen, CT-Scan, USG
7. Describe the normal and abnormal physiological event during the puberty, pregnancy, labour, perimenstruation and pre, peri and post menopause

THEORY

TOPICS TO BE COVERED:

1. Fluid, Electrolyte and Acid-Base disturbances – Diagnosis and management ; Nutrition in the surgical patient., Shock - Clinical feature, pathology & management.
2. Transfusion therapy in surgery – blood components, complications of transfusion .
3. Wounds :
 - a) Classification, acute wounds, chronic wounds.
 - b) Wound healing – Basic process involved in wound repair, basic phases in the healing process, clinical management of wounds, factors affecting wound healing, scars - type and treatment.
 - c) Wound Infections, - physiology & manifestation, types of infections, treatment, principle of antimicrobial treatment.
4. Pre & postoperative complications of surgery and their management.
5. Hemostasis – Components, hemostatic disorders, factors affecting bleeding during surgery.
6. Types of anaesthesia and its effects on the patient, pain relief.
7. Types of Incisions ; Clips Ligatures and Sutures; General Thoracic Procedures, Radiologic Diagnostic procedures, Endoscopy–types, Biopsy – uses and types. Overview and Drainage systems and tubes used in Surgery.
8. Burn:
Definition, Classification, Causes, Prevention, Pathological changes, Complications, Clinical Features and Management.
9. Skin Grafts :
Types, Grafting Procedures, Survival of Skin Graft ; Flaps – Types and uses of Flaps.

10. Infections and injuries of Hand :
Hand infection, suppurative infection, other infection, hand injuries, Dupuytren's contracture.
11. Surgical Oncology – Cancer –
Definition, types, clinical manifestations of cancer, Staging of Cancer, surgical procedures involved in the management of cancer.
12. Disorders of muscles, tendons and ligaments, sports related injuries. Periarticular inflammations acute muscle injury, chronic muscles injury, Tendon disorders, tendon sheath disorder, fascia, Ganglia, Bursae, Repetitive strain injury.
13. Various surgical heart diseases with respect to clinical presentation, complications and management -
Valvular heart disease, congenital heart disease –e.g., ASD, VSD, PDA, Ischaemic heart disease. Outline of postoperative complications in cardiac surgery and their management.
14. Definition, Indication, Incision, Physiological changes and Complications following Common operations like Cholecystectomy, Colostomy, Ileostomy, Gastrectomy, Hernias, Appendicectomy Mastectomy, Nephrectomy, Prostatectomy.
15. Obstetrics & Gynecology :
Surgical procedures involving child birth. Incontinence – Types, Causes, Assessment and Management, Common gynecology disorders - salpingitis, parametritis, retroverted uterus prolapse of uterus, pelvic inflammation, Definition & indications of – Hysterosalpingography, Dilatation and Curettage, Laparoscopy, Colposcopy, & Hysterectomy,
16. ENT:
Common problems of ear, otitis media, Otosclerosis, functional aphonia and deafness, facial palsy - classification, medical and surgical management of lower motor neuron type of facial palsy.
17. Ophthalmology:
common inflammation and other infections of eye, ptosis, defects of the external rectus, cataract, refractions, pleoptic exercises, physiologic defects of vision.

Bachelor of Physiotherapy (BPT) –VI Semester

CLINICAL NEUROLOGY AND NEURO SURGERY

Subject Code: BPT-601

Min. Hrs. : 120 Hrs.

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

COURSE LEARNING OUTCOMES: The student will be able to

1. Describe Etiology, Pathophysiology, Signs & Symptoms, Management of Neurologic and Pediatric conditions
2. Describe the clinical examination of Neurological System
3. Acquire knowledge in-brief about intra-uterine development of the foetus
4. Describe normal development & growth of a child & psychological aspect of development
5. Describe the clinical examination of a neonate/child with respect to neurological, Musculoskeletal, Respiratory & Cardiovascular conditions

THEORY

TOPICS TO BE COVERED:

1. Disorders of function in the context of pathophysiology, anatomy in neurology and cortical mapping
2. Classification of neurological involvement depending on level of lesion
3. Neurological assessment: Principles of clinical diagnosis, higher mental function, assessment of brain & spinal cord function, evaluation of cranial nerves and evaluation of autonomic nervous system.
4. Investigations: principles, methods, views, normal/abnormal values/features types of following investigative procedures – skull x ray, CT, MRI, evoked potentials , lumbar puncture , CSF examination, EMG ,NCV
5. Neuro-ophthalmology: assessment of visual function- acuity, field, colour, vision, pupillary reflex, accommodation reflex, abnormalities of optic disc, disorders of optic nerve, tract, radiation, occipital pole, disorders of higher visual processing, disorders of pupil, disorders of eye movement, central disorders of eye movement.
6. Deafness, vertigo, and imbalance: physiology of hearing, disorders of hearing, examination & investigations of hearing, tests of vestibular function, vertigo, peripheral vestibular disorders, central vestibular vertigo.
Lower cranial nerve paralysis- etiology, clinical features, investigations and management of following disorders – lesions in trigeminal nerve, trigeminal neuralgia, trigeminal sensory neuropathy, lesions in facial nerve, facial palsy, bells palsy hemifacial spasm, glossopharyngeal neuralgia, lesions of Vagus nerve, lesion of spinal accessory nerve, lesions of hypoglossal nerve, dysphagia- swallowing mechanisms, causes of dysphagia, symptoms, examinations and management of dysphagia
7. Cerebro-vascular diseases: define stroke, TIA, RIA, stroke in evolution, multi infarct dementia and lacunar infarct, classification of stroke – ischaemic, haemorrhagic , venous infarcts, risk factors, causes of ischaemic stroke, causes of haemorrhagic stroke , Classifications of haemorrhagic stroke, classification of stroke based on symptoms, stroke syndrome , investigations, differential diagnosis, medical and surgical management
8. Head injury: Etiology ,classification, clinical signs & symptoms investigations, differential diagnosis, medical management ,surgical management and complication.
9. Higher cortical, neuro psychological and neurobehavioural disorders: causes of blackouts, physiological nature of epilepsy, classifications , clinical features, investigations, medical & surgical management of following disorders- non epileptic attacks of childhood, epilepsy in childhood, seizures and epilepsy syndromes in adult, classification and clinical features of dyssomnias, parasomnias, dementia, obsessive- compulsive disorders. Neural bias of consciousness, causes & investigations of coma, criteria for diagnosis of brain death, etiology ,

- pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, management of perceptual disorders and speech disorders
10. Movement disorders: definition , etiology, risk factors, pathophysiology, classification, clinical signs & symptoms, investigation, differential diagnosis, medical management, surgical management and complications of following disorders- parkinsons disease , dystonia, chorea, ballism, athedosis, Tics, myoclonus and Wilson's disease.
 11. Cerebellar and coordination disorders:etiology, pathophysiology, classification, clinical signs& symptoms, investifations, differential diagnosis, management of congenitgal ataxia, friedrich ataxia, ataxia telangiectasia, metabolic ataxia, hereditary cerebellar ataxia, tabes dorsalis and syphilis.
 12. Spinal cord disorders: functions of tracts, definition, etilology, risk factors, pathophysiology, classification, clinical signs & symptoms, investigations, differential diagnosis, medical management, surgical management and complications of following disorders- spinal cord injury, compression by IVD prolapse, spinal epidural abscess, transverse myelitis , viral myelitis, syringomyelia, spina bifida, sub acute combined degeneration of the cord, hereditary spastic paraplegia, radiation myelopathy, progressive encephalomyelitis, conus medullaris syndrome, bladder & bowel dysfunction, and sarcodosis
 13. Brain tumors and spinal tumors: classification, clinical features, investigations, medical and surgical management
 14. Infections of brain and spinal cord: etiology , pathophysiology, classification, clinical signs& symptoms investigations. Differential diagnosis, medical management, surgical management and complications of following disorders- encephalitis, poliomyelitis and post polio syndrome, complications of systemic infections on nervous system- septic encephalopathy, AIDS, rheumatic fever, brucellosis, tetanus and pertussis
 15. Motor neuron diagnosis- etiology , pathophysiology,classification,clinical signs & symptoms, investigations, differential diagnosis, medical management and complications of following disorders- amyotopic lateral sclerosis, spinal muscular atrophy , hereditary bulbar palsy, neuromyotonia and post irradiation lumbosacral polyradiculopathy.
 16. Multiple sclerosis: etiology, pathophysiology, clinical signs & symptoms , investigations, differential diagnosis, medical management and complications.
 17. Disorders of neuromuscular junction- etiology , classification signs & symptoms , investigations, management of following disorder of myasthenia gravis, Eaton –Lambert syndrome and botulism.
- Muscle diseases: classification, investigations, imaging methods, muscle biopsy, management of muscle disease, genetic counseling, classification, etiology , signs & symptoms of following disorders- muscular dystrophy, myotonic dystrophy, myopathy, non dystrophic myotonia.
18. Polyneuropathy- classification of polyneuropathies, hereditary motor sensory neuropathy, hereditary sensory and autonomic neuropathies, amyloid neuropathy, acute idiopathic polyneuropathy, Guillain –Barre syndrome – causes, clinical features, management of GBS ,chronic idiopathic polyneuropathies, diagnosis of plyneuropathy, nerve biopsy.
 19. Focal peripheral neuropath: clinical diagnosis of focal neuropathy, neurotmesis, axonotmesis, neuropraxia, etiology , risk factors, classification, neurological signs and symptoms , investigation, managemtn of following disorders- RSD, nerve tumors, brachial plexus palsy, thoracic outlet sundrome, lumbosacral plexus lesions, phrenic and intercostals nerve lesions, median nerve palsy, ulnar nerve palsy,radial nerve palsy, musculocutaneous nerve palsy, anterior and posterior interosseous nerve palsy, sciatic nerve palsy, long thoracic palsy, suprascapular nerve palsy, sciatic nerve palsy , tibial nerve palsy, common peroneal nerve palsy, femoral nerve palsy, obturator nerve palsy, pedundal nerve palsy
 20. Pediatric neurology: neural development, etiology, pathophysiology, classification, clinical signs and symptoms, investigation, differential diagnosis , medical management, surgical management and complications of following disorders- cerebral palsy, hydrocephalus , Arnold chiari, malformations,Klippel-Feil syndrome, Poliomyelitis, Achondroplasia, Cerabral malformations, autism, dandy walker syndrome and down's syndrome.
 21. Toxic metabolic and environmental disorders: etiology, risk factors classification, neurological signs and symptoms,investigation, management of following disorders- encephalopathy, alcohol toxicity, recreational drug abuse, toxic gases, asphyxia, therapeutic and diagnostic agent toxicity, metal toxicity, pesticide poisoning and environmental and physical insults, pants and funal poisoning ,animal poisons and complications of organ transplantation .
 22. Introduction, indications and complications of following neurosurgeries : craniotomy, cranioplasty,stereotactic surgery, deep brain stimulation, burrhole, shunting, laminectomy, hemilaminectomy, rhizotomy, microvascular decompression surgery, endarterectomy,

embolization, pituitary surgery, ablative surgery- thalamotomy and pallidotomy, coiling of aneurysm, clipping of aneurysm and neural implantation.

CARDIOLOGY AND PULMONOLOGY

Subject Code: BPT-602

Min. Hrs. : 80 Hrs.

THEORY

Following the basic science and clinical science course, this course introduces the student in cardio-thoracic conditions which commonly cause disability.

The objective of the course is that after lectures and demonstrations in addition to clinics the student will be able to demonstrate an understanding of cardio-thoracic conditions causing disability and their management. Particular effort made in this course to avoid burdening the student with any detail pertaining to diagnosis which will not contribute to their understanding of the limitations imposed by cardiovascular pathology on the functioning of the individual.

1. Anatomy and physiology

a. Respiratory system: Upper respiratory tract, lower respiratory tract – trachea, bronchial tree, bronchopulmonary segments, respiratory unit, hilum of lung, muscles of respiration, pleura, intrapleural space, intrapleural pressure, surfactant, mechanics of respiration- chest wall movements, lung and chest compliance, V/Q relationship, airway resistance, respiratory center, neural and chemical regulation of respiration, lung volume and lung capacities, spirometer, lung function test, pulmonary circulation, lung sounds, cough reflex

b. Cardiovascular system; chambers of heart, semilunar and atrioventricular valves, coronary circulation, conductive system of heart, cardiac cycle, ECG, heart sounds, BP, pulse, cardiac output.

2. Cardiovascular system diseases

a. Define, etiology, pathogenesis, clinical features, complications

b. conservative and surgical management of the following conditions

- Ischemic heart disease
- Myocardial infarction
- Heart failure
- Cardiac arrest
- Rheumatic fever
- Hypertension
- Infective endocarditis
- Myocarditis and cardiomyopathy

Examination of the cardiovascular system investigations ; ECG, Exercise stress testing, radiology, Clinical manifestations of cardiovascular disease, definition, etiology, clinical features, signs and symptoms, complications, managements and treatments of the following diseases and disorders of the heart; pericarditis, myocarditis, Rheumatic fever – resulting on valve disorders, ischemic heart disease, coronary valve disease, congenital disorders of the heart; cardiac arrest; examination and investigations of diseases of arteries and veins; hypertension: definition, cause, classification, types, assessment, investigations and management.

c. Disorders of the Heart – definition, clinical features, diagnosis, and choice of management of the following disorders; congenital heart disease – acyanotic congenital heart disease; patent ductus arteriosus, coarctation of aorta, atrial septal defect, ventricular septal defect, tetralogy of Fallot, transposition of great vessels; acquired heart disease – mitral stenosis and insufficiency, aortic stenosis and insufficiency, ischemic heart disease, coronary artery disease, cardiac tumors.

3. Respiratory system

a. Respiratory disease : Examination of the respiratory system – investigations : chest radiographs, pulmonary function testing, arterial blood gas analysis; clinical manifestations of lung disease; patterns of lung disease – COPD and restrictive lung disease: definition

,Etiology, Clinical features, Signs and symptoms , complications, management and treatment of the following lung diseases; chronic bronchitis ,emphysema, asthma , bronchiectasis , cystic fibrosis, upper respiratory tract infections , pneumonia , tuberculosis, fungal diseases, interstitial lung diseases, diseases of the pleura , diaphragm, and chest wall; respiratory failure- definition ,types ,causes , clinical features , diagnosis and management .

b. chest wall disorders – definition, clinical features, diagnosis and choice of management of the following disorders- chest wall deformities, chest wall tumors, spontaneous pneumothorax , pleural effusion, empyema, thoracis, lung abscess, hemothorax, cardiac tamponade, tracheobronchial disruption, aortic disruption, diaphragmatic disruption, esophageal disruption, cardio pulmonary contusions, bronchiectasis, tuberculosis, bronchogenic carcinoma, bronchial adenomas, metastatic tumors of the lung , tracheal stenosis , congenital tracheomalacia ,neoplasm of the trachea, lesions of the mediastinum, carcinoma of the female breast.

4. Thoracic surgeries – Thoracotomy- Definition, types of the incisions with emphasis to the site of incisions, muscles cut and complications, lung surgeries; pneumonectomy, lobectomy, segmentectomy- indications, physiological changes and complications ; thoracoplasty , pleurectomy , pleurodesis, and decortication of the lung , cardiac surgeries- and overview of the cardiopulmonary by pass machine- extra cardiac operation , closed heart surgery, open heart surgery , transplant surgery- heart , lung and kidney -indications , physiological changes and complications.

5. Diseases of the arteries and veins: definition, etiology, clinical features, signs and symptoms, complications, management and treatment of the following diseases: arteriosclerosis, atherosclerosis, aneurysm, Buerger's disease and Raynaud's disease, thrombophlebitis, deep vein thrombosis, pulmonary embolism and varicose veins.

COMMUNITY MEDICINE
Subject Code: BPT-603
Min. Hrs. : 80 Hrs.

COURSE OBJECTIVES: The subject serves to integrate the knowledge gained by the students in community medicine and other areas with skills to apply these in clinical situations of health and disease and its prevention. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify rehabilitation methods to prevent disabilities and dysfunctions due to various disease conditions and plan and set treatment goals and apply the skills gained in rehabilitating and restoring functions

COURSE LEARNING OUTCOMES: The student will be able to

1. Describe the organizational set up of the healthcare delivery system of India
2. To apply these in clinical situations of health and disease and its prevention
3. To identify rehabilitation methods to prevent disabilities and dysfunctions due to various disease conditions
4. To plan and set treatment goals and apply the skills gained in rehabilitating and restoring functions
5. To do evaluation of disability and planning for prevention and rehabilitation
6. To plan Community Based Rehabilitation in urban and rural setup
7. To describe the normal and abnormal physiological events during the puberty, labor, puerperium, post-natal stage and menopause and their PT management
8. To discuss the various complications during pregnancy, labour, puerperium and post-natal stage, pre and post-menopausal stage and various aspects of urogenital dysfunction and their PT management in brief
9. To perform clinical examination of pelvic floor
10. To perform clinical examination of pregnant woman
11. To describe Physiology of aging process and its influence on physical fitness
12. To perform Role of physiotherapist in geriatric rehabilitation

THEORY

TOPICS TO BE COVERED:

1. Health and Disease: Definitions, Concepts, Dimensions and Indicators of Health, Concept of well-being, Spectrum and Determinants of Health, Concept and natural history of Disease, Concepts of disease control and prevention, Modes of Intervention, Population Medicine, The role of socio-economic and cultural environment in health and disease.
2. Epidemiology, definition and scope. Principles of Epidemiology and Epidemiological methods: Components and Aims, Basic measurements, Methods, Uses of epidemiology, Infectious disease epidemiology, Dynamics and modes of disease transmission, Host defenses and Immunizing agents, Hazards of Immunization, Disease prevention and control, Disinfection. Screening for Disease: Concept of screening, Aims and Objectives, Uses and types of screening.
3. Epidemiology of communicable disease: Respiratory infections, Intestinal infections, Arthropodborne infections, Zoonoses, Surface infections, Hospital acquired infections Epidemiology of chronic non-communicable diseases and conditions: Cardio vascular diseases: Coronary heart disease, Hypertension, Stroke, Rheumatic heart disease, Cancer, Diabetes, Obesity, Blindness Accidents and Injuries.
4. Public health administration- an overview of the health administration set up at Central and state levels. The national health program-highlighting the role of social, economic and cultural factors in the implementation of the national programs. Health problems of vulnerable groups- pregnant and lactating women, infants and pre-school children, occupational groups.
5. Health programs in India: Vector borne disease control program, National leprosy eradication program, National tuberculosis program, National AIDS control program,

National program for control of blindness, Iodine deficiency disorders (IDD) program, Universal Immunisation program, Reproductive and child health program, National cancer control program, National mental health program. National diabetes control program, National family welfare program, National sanitation and water supply program, Minimum needs program.

6. Demography and Family Planning: Demographic cycle, Fertility, Family planning-objectives of national family planning program and family planning methods, A general idea of advantage and disadvantages of the methods.
7. Preventive Medicine in Obstetrics, Paediatrics and Geriatrics: MCH problems, Antenatal, Intranatal and post natal care, Care of children, Child health problems, Rights of child and National policy for children, MCH services and indicators of MCH care, Social welfare program for women and children, Preventive medicine and geriatrics.
8. Nutrition and Health: Classification of foods, Nutritional profiles of principal foods, Nutritional problems in public health, Community nutrition program.
9. Environment and Health: Components of environment, Water and air pollution and public health: Pollution control, Disposal of waste, Medical entomology.
10. Hospital waste management: Sources of hospital waste, Health hazards, Waste management.
11. Disaster Management: Natural and man made disasters, Disaster impact and response, Relief phase, Epidemiologic surveillance and disease control, Nutrition, Rehabilitation, Disaster preparedness.
12. Occupational Health: Occupational environment, Occupational hazards, Occupational diseases, Prevention of occupational diseases. Social security and other measures for the protection from occupational hazard accidents and diseases. Details of compensation acts.
13. Mental Health: Characteristics of a mentally healthy person, Types of mental illness, Causes of mental ill health, Prevention, Mental health services, Alcohol and drug dependence. Emphasis on community aspects of mental health.
14. Health Education: Concepts, aims and objectives, Approaches to health education, Models of health education, Contents of health education, Principles of health education, Practice of health education.

RESEARCH METHODOLOGY AND BIOSTATISTICS

Subject Code: BPT-604

Min. Hrs. : 120 Hrs.

COURSE OBJECTIVES: The objective of this module is to help the students understand the basic principles of research and methods applied to draw inferences from the research findings

COURSE LEARNING OUTCOMES: The student will be able to

1. Describe the basic principles of research and methods applied to draw inferences from the research findings
2. Discuss the basic concepts of Biostatistics
3. Explain Design, Methodology of Experiment/Survey, Demography & vital statistics, Sampling & interpretation of Data

THEORY

TOPICS TO BE COVERED:

RESEARCH METHODOLOGY

1. **Introduction to Research methodology:** Meaning of research, objectives of research, Motivation in research, Types of research & research approaches, Research methods vs methodology, Criteria for good research.
2. **Research problem:** Statement of research problem, Statement of purpose and objectives of research problem, Necessity of defining the problem
3. **Research design:** Meaning of research design, Need for research design, Features for good design, Different research designs, Basic principles of research design.
4. **Measurement & scaling techniques:** Measurement in research- Measurement scales, sources of error in measurement, Technique of developing measurement tools, Meaning of scaling, its classification, important scaling techniques.
5. **Methods of data collection:** collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules.
6. **Computer technology:** Introduction to Computers, computer application in research computers & researcher.

BIOSTATISTICS

1. **Introduction:** Meaning, definition, characteristics of statistics. Importance of the study of statistics, Branches of statistics, Statistics and health science, Parameters and Estimates, Variables and their types, Measurement scales.
2. **Tabulation of Data:** Basic principles of graphical representation, Types of diagrams – histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve, Normal probability curve.
3. **Measures of Central Tendency:** Need for measures of central Tendency, Definition and calculation of **Mean** – ungrouped and grouped, interpretation and calculation of Median-ungrouped and grouped, Meaning and calculation of Mode, Geometric mean & Harmonic mean, Guidelines for the use of various measures of central tendency.
4. **Measures of Dispersion :** Range, mean deviation, standard deviation & variance.
5. **Probability and Standard Distributions:** Meaning of probability of standard distribution, the binominal distribution, the normal distribution, Divergence from normality – skewness, kurtosis.
6. **Correlation & regression :** Significance, correlation coefficient, linear regression & regression equation.
7. **Testing of Hypotheses , Level of significance, Degrees of freedom.**
8. **Chi-square test, test of Goodness of fit & student t-test.**
9. **Analysis of variance & covariance:** Analysis of variance (ANOVA), what is ANOVA? Basic principle of ANOVA, ANOVA technique, Analysis of Co variance (ANACOVA)
10. **Sampling:** Definition, Types- simple, random, stratified, cluster and double sampling. Need for sampling - Criteria for good samples, Application of sampling in community, Procedures of sampling and sampling designs errors.

Bachelor of Physiotherapy (BPT)-Semester-VII

PHYSIOTHERAPY IN ORTHOPEADIC CONDITIONS

Subject Code: BPT – 701

Minimum Hours: Theory-60 Hrs., Practical-60 Hrs.

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

COURSE LEARNING OUTCOMES: The students will be able to

1. Apply the knowledge gained in clinical musculoskeletal and sports conditions with Physiotherapy techniques
2. To identify disabilities due to musculoskeletal and sports dysfunction, plan and set treatment goals
3. Implement the physiotherapy treatment protocol for various musculoskeletal disorders and sports injuries
4. Prescribe appropriate Orthosis /splints & will be able to fabricate temporary protective & functional splints
5. Describe treatment protocol for various musculoskeletal and sports conditions.

THEORY

TOPICS TO BE COVERED:

1. PT assessment for Orthopedic conditions - SOAP format. Subjective - history taking, informed consent, personal, past, medical and socioeconomic history, chief complaints, history of present illness. Pain assessment- intensity, character, aggravating and relieving factors, site and location. Objective- on observation - body built swelling, muscle atrophy, deformities, posture and gait. On palpation- tenderness-grades, muscle spasm, swelling-methods of swelling assessment, bony prominences, soft tissue texture and integrity, warmth and vasomotor disturbances. On examination – ROM – active and passive, resisted isometric tests, limb length-apparent, true and segmental, girth measurement, muscle length testing-tightness, Contracture and flexibility, manual muscle testing, peripheral neurological examination dermatomes, myotomes and reflexes, special tests and functional tests. Prescription of home program. Documentation of case records, and follows up.
2. Fractures - types, classification, signs and symptoms, complications. Fracture healing – factors affecting fracture healing. Principles of fracture management - reduction - open and closed, immobilization - sling, cast, brace, slab, traction - manual, mechanical, skin, skeletal, lumbar and Cervical traction, external fixation, functional cast bracing. PT management in complications - early and late - shock, compartmental syndrome, VIC, fat embolism, delayed and mal union, RSD, myositis ossificans, AVN, pressure sores etc. Physiotherapy assessment in fracture cases. Aims of PT management in fracture cases - short and long term goals. Principles of PT management in fractures - Guidelines for fracture treatment during period of immobilization and guidelines for treatment after immobilization period.
3. Specific fractures and dislocations: PT assessment and management of upper limb fractures and dislocations. PT assessment and management of lower limb fractures and dislocations including pelvis. PT assessment and management spinal fractures.

4. Principles of various schools of thought in manual therapy – Maitland, Mackenzie, Mulligan
5. Degenerative and inflammatory conditions:
Definition, signs and symptoms, clinical features, path physiology, radiological features, deformities, medical, surgical management. Describe the PT assessment and management and home program for the following conditions – Osteoarthritis - emphasis mainly on knee, hip and hand, Rheumatoid Arthritis, Ankylosing spondylitis, Gout, Perthes disease, Periarthritic shoulder.
6. Infective conditions:
Definition, signs and symptoms, clinical features, pathophysiology, radiological features, medical, surgical management. Describe PT assessment and management for following conditions – Osteomyelitis – acute and chronic, Septic arthritis, Pyogenic arthritis, TB spine and major joints - knee and hip.
7. Define; review the postural abnormalities of spinal column, clinical features, deformities, medical and surgical management. Describe PT assessment and management and home program.
8. Deformities:
Review in detail the causes, signs and symptoms, radiological features, medical and surgical management. Describe the PT. assessment and management of the following conditions : Congenital : CTEV, CDH, Torticollis, pes planus, pes cavus and other common deformities. Acquired: scoliosis, kyphosis, coxa vera, genu varum, valgum and recurvatum.
9. Amputations:
Definition, levels, indications, types, PT assessment, aims, management pre and post operatively. PT management with emphasis on stump care and bandaging. Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management.
10. Spinal conditions:
Review the causes, signs and symptoms, investigations, radiological features, neurological signs. PT assessment, aims, and management and home program of the following conditions: Cervical spondylosis, Lumbar spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacro-iliac joint dysfunction, Sacralisation, Lumbarisation, Intervertebral disc prolapse, Coccydynia, Spina bifida occulta.
11. Osteoporosis : Causes, predisposing factors, investigations and treatment.
12. Orthopedic surgeries:
Pre and post operative PT assessment, goals, precautions and PT management of following surgeries such as: Arthrodesis, Osteotomy, Arthroplasty-partial and total- Excision arthroplasty, excision arthroplasty with implant, interpositional arthroplasty and total replacement; Tendon transplant, Soft tissue release- tenotomy, myotomy, lengthening; Arthroscopy, Spinal stabilization, Re-attachment of limbs, External fixators, Synovectomy.
13. Shoulder joint:
Shoulder instabilities, TOS, RSD, Impingement syndrome – conservative and Post operative PT management. Total shoulder replacement and Hemi replacement. - Post operative PT management. AC joint injuries - rehabilitation. Rotator cuff tears- conservative and surgical repair. Subacromial decompression - Post operative PT management.
14. Elbow and forearm:
Excision of radial head - Post operative PT management. Total elbow arthroplasty- Post operative PT management.
15. Wrist and Hand:
Total wrist arthroplasty. Repair of ruptured extensor tendons. Carpal tunnel syndrome. Flexor and extensor tendon lacerations - Post operative PT management.
16. Hip:
Joint surgeries- hemi and total hip replacement - Post operative PT management Tendonitis and bursitis. - Management.
17. Knee:
Lateral retinacular release, chondroplasty- Post operative management. Realignment of extensor mechanism. ACL and PCL reconstruction surgeries - Post operative rehabilitation.

Meniscectomy and meniscal repair - Post operative management. Plica syndrome, patellar dysfunction and Hoffa's syndrome - conservative management. TKR- rehabilitation protocol. Patellar tendon ruptures and Patellectomy- rehabilitation.

PRACTICALS

COURSE OBJECTIVES: The objective of this module is to discuss the Patho-physiology, clinical manifestations and conservative/surgical management of various traumatic cases of the Musculo-skeletal conditions, skill of clinical examination and interpretation of the pre-operative cases and post-operative cases, investigation used in musculoskeletal conditions, Pathological/biochemical studies pertaining to musculoskeletal conditions with radiological findings

COURSE LEARNING OUTCOMES: The student will be able to

1. Identify the musculoskeletal dysfunctions
2. Describe effective goals and treatment plan
3. Demonstrate the special test used to diagnose in various musculoskeletal condition
4. Implement and assess progression of treatment plan
5. Design the physiotherapy treatment for various musculoskeletal disorders
6. Demonstrate the various exercise techniques used in musculoskeletal disorders

TOPICS TO BE COVERED:

1. Practical demonstration of basic principles of physiotherapy assessment, functional assessment and application of physiotherapy in orthopaedics conditions.
2. Student must maintain a logbook. The duly completed logbook should be submitted during practical examination.

PHYSIOTHERAPY IN NEUROLOGICAL CONDITIONS

Subject Code: BPT – 702

Minimum Hours: Theory-60 Hrs., Practical-60 Hrs.

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

COURSE LEARNING OUTCOMES: The student will be able to

1. Describe the assessment and physiotherapy management for neurology and neurosurgery
2. To identify disabilities due to neurological dysfunction, plan and set treatment goals
3. To apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore neurological function
4. Identify & analyze Neuro-motor & psychosomatic dysfunction
5. Implement the Advice & parents education in Neuro-pediatric care
6. Be able to prescribe appropriate Orthosis/splints & will be able to fabricate temporary protective & functional splints.

THEORY

TOPICS TO BE COVERED:

- 1) Review of basic Neuro-Anatomy and Physiology
- 2) Physiotherapy evaluation of a neurological patient, electro diagnostic procedures, interpretations and prognosis in different neurological conditions, Upper and Lower motor neuron lesions.
- 3) Principles of physiotherapy programs, reeducation and retraining techniques in neurological conditions, approaches like: Bobath's/ neuro developmental therapy, Rood's approach, PNF, Vojta techniques, biofeedback, Brunnstrom movement therapy, Motor Relearning programming, sensory integration therapy.
- 4) Disturbance of speech and aphasia
- 5) Spinal cord injury:
review of anatomy and physiology, Physiotherapy Assessment of Spinal cord injury, Principles of Physiotherapy at various stages of Spinal cord injury
Rehabilitation goals and ADL training
- 6) Assessment and principles of therapeutic management of following neurological conditions:
 - Stroke, meningitis, encephalitis, Parkinson's disease, Cerebral palsy, cerebellar lesions, Brain tumors, Multiple Sclerosis, facial palsy.
 - Motor neuron disease, Disseminated sclerosis, transverse myelitis, polio, syringomyelia, spina bifida,
 - Neuropathies, neuromuscular junction disorders and myopathies
- 7) Peripheral nerve injuries, surgical resection & repair:
 - Classification & types
 - Functional assessment, investigation, diagnosis & prognosis
 - Physiotherapeutic management
 - Poly neuropathy
- 8) Traumatic brain injury:
 - Types and Mechanisms of head injury
 - Clinical features, potential complications
 - Physiotherapy principles of immediate and postoperative therapeutic management
- 9) Neurosurgery:
Post surgical Physical therapy in neurosurgical procedures – craniotomy, shunts, SOL resection, surgical treatment of spasticity, cervical cord decompression.

PRACTICAL

COURSE OBJECTIVES: The subject follows inheritance of imparting basic as well as advanced information in a wide range of Neurological disorders. The same shall augment and enhance ones abilities in treating and overall smooth and efficient handling in patients suffering with the most widely predominant as well as specific Neurological disorders

COURSE LEARNING OUTCOMES: The student will be able to

1. Demonstrate the neurological dysfunctions in both upper motor neuron and lower motor neuron diseases
2. Design the goals and treatment plan
3. Implement and assess progression of treatment plan
4. To apply theoretical knowledge of neurological physiotherapy in rehabilitation of neurological patients

TOPICS TO BE COVERED:

1. Practical demonstration of basic principles of physiotherapy assessment, functional assessment and application of physiotherapy in neurology conditions.
2. Student must maintain a logbook. The duly completed logbook should be submitted during practical examination.

PHYSIOTHERAPY IN CARDIO PULMONARY AND INTENSIVE CARE

Subject Code: BPT – 703

Minimum Hours: Theory-60 Hrs., Practical-60 Hrs.

COURSE OBJECTIVES: Following the basic science and clinical science course, this course introduces the Student in cardio-thoracic conditions which commonly cause disability. The objective of this course is that after lectures and demonstration in addition to clinics the student will be able to demonstrate an understanding of Cardio-pulmonary conditions causing disability and their management. Particular effort is made in this course to avoid burdening the student with any detail pertaining to diagnosis which will not contribute to their understanding of the limitations imposed by cardiovascular pathology on the functioning of the individual

COURSE LEARNING OBJECTIVES: The student will be able to-

1. Discuss the Cardio-pulmonary conditions which commonly cause disability
2. Describe the Cardio-pulmonary conditions causing disability and their management
3. Interpret the investigation used in cardio respiratory conditions

THEORY

TOPICS TO BE COVERED:

1. Anatomical and Physiological differences between the Adult and Pediatric lung.
2. Bedside assessment of the patient-Adult & Pediatric.
3. Investigations and tests – Exercise tolerance Testing – Cardiac & Pulmonary, Radiography, PFT, ABG, ECG, Hematological and Biochemical Tests
4. Physiotherapy techniques to increase lung volume – controlled mobilization, positioning, breathing exercises, Neurophysiological Facilitation of Respiration, Mechanical aids - Incentive Spirometry, CPAP, IPPB
5. Physiotherapy techniques to decrease the work of breathing – Measures to optimize the balance between energy supply and demand, positioning, Breathing re-education – Breathing control techniques, mechanical aids – IPPB, CPAP, BiPAP
6. Physiotherapy techniques to clear secretions – Hydration, Humidification & Nebulisation, Mobilisation and Breathing exercises, Postural Drainage, Manual techniques – Percussion, Vibration and Shaking, Rib Springing, ACBT, Autogenic Drainage, Mechanical Aids – PEP, Flutter, IPPB, Facilitation of Cough and Huff, Nasopharyngeal Suctioning
7. Drug therapy – Drugs to prevent and treat inflammation, Drugs to treat Bronchospasm, Drugs to treat Breathlessness, Drugs to help sputum clearance, Drugs to inhibit coughing, Drugs to improve ventilation, Drugs to reduce pulmonary hypertension, Drug delivery doses, Inhaled Nebulisers.
8. Neonatal and Pediatric Physiotherapy – Chest physiotherapy for children, The neonatal unit, Modifications of chest physiotherapy for specific neonatal disorders, Emergencies in the neonatal unit.
9. Physiotherapy in Obstructive lung conditions
10. Physiotherapy in Restrictive lung conditions.
11. Management of breathlessness.
12. Pulmonary Rehabilitation.
13. Physiotherapy following Lung surgeries.
14. Respiratory failure – Oxygen Therapy and Mechanical Ventilation.
Introduction to ICU : ICU monitoring –Apparatus, Airways and Tubes used in the ICU - Physiotherapy in the ICU – Common conditions in the ICU – Tetanus, Head Injury, Lung Disease, Pulmonary Oedema, Multiple Organ Failure, Neuromuscular Disease, Smoke Inhalation, Poisoning, Aspiration, Near Drowning, ARDS, Shock; Dealing with an Emergency Situation in the ICU.
15. Physiotherapy management following cardiac surgeries.
16. Cardiac Rehabilitation.

PRACTICAL

COURSE OBJECTIVES: The course follows exercising in practical format in treating cardiovascular and pulmonary conditions at any setup installed existing at the rural to the most urbanized tertiary care with the modernist supporting equipments. An in-depth knowledge regarding basics and advances shall render promising treatment strategies

COURSE LEARNING OUTCOMES: The student will be able to–

1. Discuss the assessment of cardiac and respiratory systems for various General Medical and Surgical conditions
2. Explain the monitoring of the patient in regard to treatment
3. Discuss on monitor the patient's vital signs
4. Identify the emergency drugs indication and contra-indication
5. Implement the appropriate interventions to the patient in Intensive Care Unit (ICU)
6. Design the physiotherapy interventions for cardiorespiratory conditions.
7. To demonstrate the cardiology physical assessment
8. To demonstrate the respiratory physical assessment
9. To demonstrate treatment schedule for cardio respiratory conditions.
10. To implement and assess progression of treatment plan

TOPICS TO BE COVERED:

1. Practical demonstration of basic principles of physiotherapy assessment, functional assessment and application of physiotherapy in cardio – respiratory, OBG, Skin, and other medical conditions.
2. Student must maintain a logbook. The duly completed logbook should be submitted during practical examination.

Bachelor of Physiotherapy (BPT)-Semester-VIII

PHYSIOTHERAPY IN SPORTS

Subject Code: BPT – 801

Minimum Hours: Theory-60 Hrs., Practical-60 Hrs.

COURSE OBJECTIVES: The subject serves to integrate the knowledge gained by the students in sports conditions with skills to apply these in clinical situations of dysfunction and sports injuries. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify disabilities due to sports related dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore musculoskeletal function

COURSE LEARNING OUTCOMES: The students will be able to

1. Apply the knowledge gained in clinical sports conditions with Physiotherapy techniques
2. To identify disabilities due to sports dysfunction, plan and set treatment goals
3. Implement the physiotherapy treatment protocol for various sports injuries
4. Prescribe appropriate Orthosis /splints & will be able to fabricate temporary protective & functional splints
5. Describe treatment protocol for various sports conditions.

THEORY

TOPICS TO BE COVERED:

1. Pre-exercise evaluation
2. Diet and nutrition
Measurement of fitness components and sports skills - Measurement of muscular strength, Measurement of muscular endurance, Measurement of flexibility, Determination exercise endurance,
3. Physiological effects of exercise on body systems - Muscular system, Endocrine system, Cardio-respiratory system, Nervous system
4. Sports injuries - Spine – PIVD, Kissing spine, cervical whiplash injuries, facet joint syndrome, SI joint dysfunction, Hip – muscle strain, piriformis syndrome, ITB syndrome, osteitis pubis, Knee – menisci, cruciate, collateral, osteochondritis, chondromalacia patellae, biceps femoris tendonitis, swimmers knee, patello-femoral pain syndrome, Leg & ankle – shin splint, achillis tendonitis & rupture, TA bursitis, ankle sprain, plantar fascitis, turf toe syndrome, Head & face – maxillo-facial injuries, helmet compression syndrome.
5. Sports injuries
Shoulder – instability, rotator cuff injury, biceps tendonitis and rupture, pectoralis major rupture, scapular dyskinesis and acromio-clavicular joint injuries, Elbow – tennis elbow, golfer's elbow, Wrist and hand – carpal tunnel syndrome, gamekeeper's thumb.
6. Principles of injury prevention.
7. Principles of training & Rehabilitation in sports injuries.
8. Sports in Special age groups: Female athletic triad, Younger athlete- Musculo-skeletal problems, management, children with chronic illness and nutrition. Older athlete- Physiological changes with aging, benefits, risks of exercise in elderly, exercise prescription guidelines for elderly.

PRACTICAL

COURSE OBJECTIVES: The objective of this module is to discuss the Patho-physiology, clinical manifestations and conservative/surgical management of various traumatic cases of the Musculo-skeletal conditions, skill of clinical examination and interpretation of the pre-operative cases and post-operative cases, investigation used in musculoskeletal conditions, Pathological/biochemical studies pertaining to musculoskeletal conditions with radiological findings

COURSE LEARNING OUTCOMES: The student will be able to

1. Identify the musculoskeletal dysfunctions
2. Describe effective goals and treatment plan
3. Demonstrate the special test used to diagnose in various musculoskeletal condition
4. Implement and assess progression of treatment plan
5. Design the physiotherapy treatment for various musculoskeletal disorders
6. Demonstrate the various exercise techniques used in musculoskeletal disorders

TOPICS TO BE COVERED:

1. Practical demonstration of basic principles of physiotherapy assessment, functional assessment and application of sports physiotherapy
2. Student must maintain a logbook. The duly completed logbook should be submitted during practical examination.

PHYSIOTHERAPY IN GENERAL MEDICINE AND GENERAL SURGERY

Subject Code: BPT – 802

Minimum Hours: Theory-60 Hrs., Practical-60 Hrs.

COURSE OBJECTIVES: The subject serves to integrate the knowledge gained by the students in General Medicine and Surgery with skills to apply these in clinical situations of dysfunction and musculoskeletal pathology. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify conditions

COURSE LEARNING OUTCOMES: The student will be able to-

1. Identify discuss and analyze cardiovascular and pulmonary dysfunctions based on patho-physiological principles and arrive at appropriate functional diagnosis
2. Acquire knowledge of rationales of basic investigative approaches in the medical system and surgical intervention, regimes in general surgeries (special emphasis on abdominal surgeries)
3. Execute effective physiotherapeutic measures (with appropriate clinical reasoning) and exercise, conditioning in general medical and surgical conditions
4. Acquire knowledge of the overview of patient's care in the I.C.U. for bronchial hygiene and continuous monitoring of the patient in I.C.U
5. Select strategies for cure, care and prevention, adopt restorative and rehabilitative measures for maximum possible functional independence of a patient at home, work and in community
6. Acquire the knowledge of evaluation and physiotherapeutic treatment for obstetric and gynecological conditions

THEORY

TOPICS TO BE COVERED:

1. Management of wound ulcers- Care of ulcers and wounds - Care of surgical scars-U.V.R and other electro therapeutics for healing of wounds, prevention of Hypergranulated Scars Keoloids, Electrotherapeutics measures for relief of pain during mobilization of scars tissues
2. Physiotherapy in dermatology -Documentation of assessment, treatment and follow up skin conditions. U.V.R therapy in various skin conditions; Vitiligo; Hair loss; Pigmentation; Infected wounds ulcers. Faradic foot bath for Hyperhidrosis. Care of anesthetic hand and foot; Evaluation, planning and management of leprosy- prescription, fitting and training with prosthetic and orthotic devices.
3. Burns management - Role of physiotherapy in the management of burns, post grafted cases- Mobilization and Musculo-skeletal restorative exercises following burns.
4. Physiotherapy management following Peripheral Vascular Disease (PVD).
5. Abdominal Surgeries - Management of Pulmonary Restorative Dysfunction following surgical procedures on Abdomen and Thorax.
6. Management of Amputations following Diabetes, PVD - Prosthesis in amputations of lower limbs following ulcers and gangrenes
7. Physiotherapy intervention in the management of Medical, Surgical and Radiation Oncology Cases
8. Home program and education of family members in patient care.
9. Physiotherapy in Obstetrics – Antenatal Care, Antenatal Education, Postnatal Care. Electrotherapy and Exercise Therapy measures for the re-education of Ano-Urethral sphincter.
10. Treatment, Response to exercise and Implications of Physiotherapy in the following disease conditions: Hypertension, Diabetes, Renal Failure and Obesity.
11. Geriatrics: Problems in old age, role of physiotherapy in elderly
12. Acquire the knowledge of various conditions where physiotherapy plays a vital role in the rehabilitation (psychiatry dermatology, geriatric and ENT conditions).

13. Evaluate, grade and treat non healing wounds.

14. Physiotherapy in mother and children care-ante and post-natal management, early intervention and simulation therapy in childcare (movement therapy).

PRACTICAL

COURSE OBJECTIVES: The subject serves to integrate the practical knowledge gained by the students in General Medicine and Surgery with skills to apply these in clinical situations of dysfunction and pathology. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify conditions.

Practical shall be conducted for all the relevant topics discussed in theory in the following forms:

1. Besides case presentations and case discussions

2. Lab session consist of evaluation and assessment methods on student models, treatment techniques and practice sessions.

COMMUNITY PHYSIOTHERAPY AND REHABILITATION

Subject Code: BPT – 803

Minimum Hours: Theory-60 Hrs., Practical-60 Hrs.

COURSE OBJECTIVES: The subject serves to integrate the knowledge gained by the students in community medicine and other areas with skills to apply these in clinical situations of health and disease and its prevention. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify rehabilitation methods to prevent disabilities and dysfunctions due to various disease conditions and plan and set treatment goals and apply the skills gained in rehabilitating and restoring functions

COURSE LEARNING OUTCOMES: The student will be able to

1. Describe the organizational set up of the healthcare delivery system of India
2. To apply these in clinical situations of health and disease and its prevention
3. To identify rehabilitation methods to prevent disabilities and dysfunctions due to various disease conditions
4. To plan and set treatment goals and apply the skills gained in rehabilitating and restoring functions
5. To do evaluation of disability and planning for prevention and rehabilitation
6. To plan Community Based Rehabilitation in urban and rural setup
7. To describe the normal and abnormal physiological events during the puberty, labor, puerperium, post-natal stage and menopause and their PT management
8. To discuss the various complications during pregnancy, labour, puerperium and post-natalstage, pre and post-menopausal stage and various aspects of urogenital dysfunction and their PT management in brief
9. To perform clinical examination of pelvic floor
10. To perform clinical examination of pregnant woman
11. To describe Physiology of aging process and its influence on physical fitness
12. To perform Role of physiotherapist in geriatric rehabilitation

THEORY

TOPICS TO BE COVERED:

1. Introduction of Rehabilitation & History
2. Epidemiology of disability (Impairment, disability, phases of disability process, etc.).
3. Principles of Rehabilitation & concept of team approach with rolls of each individual participant.
4. Organization of Rehabilitation unit.
5. Disability prevention evaluation & principles of Rehabilitation Management.
6. Role of Physiotherapy in Rehabilitation (Preventive, treatment & restoration)
7. Brief outline of Communication disorder & its implications on Rehabilitation process.
8. Brief outline of psychosocial & vocational aspects of Rehabilitation.
9. Introduction to Occupational therapy.
10. Activities of daily living, functional assessment & training for functional independence.
11. Brief outline of basic community medicine with special reference to community based Rehabilitation, infrastructure and role of CBR
12. Assessment of disability in rural & urban setups. Health care delivery system & preventive measures with specific reference to disabling conditions. Community education program.
13. Application of Physiotherapy skills at community level with special reference to the need at rural level.
14. Role of voluntary Organizations in CBR: Charitable Organizations, Voluntary health agencies – National level and International NGO's, Multilateral and Bilateral agencies.

International Health Organizations: WHO, UNICEF, UNDP, UNFPA, FAO, ILO, World bank, USAID, SIDA, DANIDA, Rockefeller, Ford foundation, CARE, RED CROSS.

15. National District Level Rehabilitation Program: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker.
16. Role of Physiotherapy in CBR: Screening for disabilities, Prescribing exercise program, Prescribing and devising low cost locally available assistive aids, Modifications physical and architectural barriers for disabled, Disability prevention, Strategies to improve ADL, Rehabilitation program for various neuro-musculoskeletal and cardiothoracic disabilities.

ORTHOTICS AND PROSTHETICS

1. Introduction to surgical anatomy and various pathological deviations with respect to brace fitting.
2. Rationale of prescribing Prosthetic and Orthotic devices.
3. Types of Prosthetic and Orthotic devices: Spinal, Lower limb, and Upper limb.
4. Checkout, usage advice, precautions, and follow-up.
5. Walking aids and wheel chairs: prescription, usage advice, and follow-up.

PRACTICAL

1. Demonstration of methods of using orthotics & prosthetics devices.
2. Methods of organization of community based rehabilitation centres.
3. Visit of different rehabilitation centres and preparing a report of the visit & viva-voce of the aforesaid report.