

GUJARAT UNIVERSITY

Faculty of Medicine

Degree of Bachelor of Physiotherapy
(B. Physio.)

**Courses of studies prescribed for First, Second, Third & Final
B. Physiotherapy Examination**

(In force for students admitted in August 2012 & thereafter)

O.B. PHYSIO-1: Duration of course:

Every student shall undergo a period of certified study extending over four academic years divided into 8 semesters i.e. 6 months each from the date of commencement of study for the subjects comprising P.T. curriculum to the date of completion of final B.P.T. examination successfully and followed by 6 months compulsory rotating internship.

The academic year for U.G.P.T. students shall consist of two terms viz.

1. The first terms commencing on 1st August and ending on 31st January.
2. Second term from 1st February to 31st July.

O.B. PHYSIO-2: Medium of instruction & eligibility criteria:

English shall be the medium of instruction for all the subjects of study and for the exams of B.P.T. course.

Candidate must have passed Higher Secondary Certificate Examination under 10+2 education pattern taking with Physics, Chemistry, Biology and English or equivalent examination.

Eligible candidates should have completed the age of 17 years by 31st December of the year of his/her joining the college.

O.B. PHYSIO-3: Essentialities for qualifying to appear in university examinations

Fresh appearing candidates before presenting themselves for the University examination shall, have

- (a) Attended 75% of the minimum prescribed teaching hours as per O.B. PHYSIO-9 (Lectures and practical including clinics, seminars, group discussions, tutorials, demonstrations etc.)
- (b) Secured at least 35% marks of internal assessment.
- (c) If a student is found appearing in the university exams without fulfilling the conditions in O.B. Physio-3 criteria, his/her university result of the concerned subject/s should be cancelled.

O.B. PHYSIO-4: Criteria for passing:

To pass any B. Physiotherapy examination a student must obtain at least 50% marks in theory and practical aggregate. It is not compulsory to pass in section – I and section – II separately.

- (a) Passing in First Year B.P.T Examination is not compulsory before proceeding to second year B.P.T training. However, passing in First Year B.P.T. examination is compulsory for being eligible for second year B.P.T. examination.
- (b) Passing for 2nd year B. Physiotherapy Examination is not compulsory before entering for 3rd B. Physiotherapy training. However, passing in 2nd year B. Physiotherapy is compulsory for being eligible for 3rd year B. Physiotherapy Examination.
- (c) Passing in 3rd year B. Physiotherapy Examination is not compulsory before entering for 4th year B. Physiotherapy training. However, passing in 3rd year B. Physiotherapy is compulsory for being eligible for 4th year B. Physiotherapy Examination.

O.B. PHYSIO-5: Definition of Trail:

First trial is deemed to take place when the candidate is due to appear for the examination irrespective of his/her actual appearance, provided that non-appearance is not a result of reasons beyond his/her control. Similarly 2nd, 3rd, etc, trials relating to subsequent examination.

O.H. PHYSIO-6:**(A) Exemption:**

Candidates who have passed in any of the subject/subjects may at their option be excused for appearing in that subject/subjects at a subsequent examination. But they should not be declared to have passed the whole examination until they have passed in all subjects in the particular examination.

(B) University examinations will be held twice during the year at the end of each Term.

O.B. PHYSIO-7:**(A) Awards and Prizes:**

The Following shall be eligible for the university awards and prizes. Those who appear and pass the first, second, third, or final B. Physio Examination at their first attempt in a regular batch.

(B) Declaration of class:

Distinction – 75% and more marks in grand total aggregate in 1st attempt

First class – 60-75% in grand total aggregate in 1st attempt

Second class – 50-60% in grand total aggregate in 1st attempt

Pass class – passed in more than 1 attempt irrespective of the % of marks secured

Rank shall be declared on the basis of aggregate marks obtained by a candidate in university subjects only. Students who have passed all the subject in 1st attempt in all four Years without a gracing shall be eligible for the award of rank.

O.B. Physio-8: Compulsory Rotating Internship:

In order to qualify for B.P.T. degree every student after passing final B.P.T. exam shall do compulsory rotating internship for a period of 6 months in a physiotherapy institution/center.

The concerned college authorities shall do the posting of the successful candidates for internship within 15 days of declaration of result of final B.P.T. exam

During training of internship 75% presence is compulsory, failing which an intern will have to repeat the term (training).

O.B. PHYSIO-9: Course of study and exams:**F.Y. B.P.T.**

Consisting of 2 semesters (1st and 2nd). University exams of F.Y.B.P.T. shall be held at the end of the 2nd semester.

SUBJECT	TEACHING HOURS		
	THEORY	PRACTICAL	TOTAL
HUMAN ANATOMY	125	175	300
HUMAN PHYSIOLOGY & BIOCHEMISTRY	100 50	100 -	200 50
PSYCHOLOGY	60	-	60
SOCIOLOGY	60	-	60
BIO-MEDICAL PHYSICS (FUNDAMENTALS OF PHYSIOTHERAPY)	70	30	100
EXERCISE THERAPY – I	175	100	275
COMPUTER APPLICATION*	60	40	100
ENGLISH*	60	-	60
TOTAL HRS (THEORY & PRACTICAL)			1205
REVISION, PRELIM EXAMS			200
Grand Total			1405
* Computer Application & English are not for University Examination			

Exams:

PAPER NO.	SUBJECT	MARKS				
		THEORY		PRACTICAL		TOTAL
		EXTERNAL	INTERNAL	EXTERNAL	INTERNAL	
1.	HUMAN ANATOMY	80	20	80	20	200
2.	HUMAN PHYSIOLOGY & BIOCHEMISTRY	80 (56+24)	20 (14+06)	80	20	200
3.	PSYCHOLOGY + SOCIOLOGY	40 + 40	20 (10+10)	-	-	100
4.	BIO-MEDICAL PHYSICS	80	20	40	10	150
5.	EXERCISE THERAPY - I	80	20	80	20	200

S.Y. B.P.T.

Consisting of 2 semesters (3rd and 4th). University exams of S.Y. B.P.T. shall be held at the end of the 4th semester.

SUBJECT	TEACHING HOURS		
	THEORY	PRACTICAL	TOTAL
PATHOLOGY	50	-	50
MICROBIOLOGY	50	-	50
PHARMACOLOGY	50	-	50
BIostatISTICS & RESEARCH METHODOLOGY	50	-	50
EXERCISE THERAPY - II	150	100	250
KINESIOLOGY	75	-	75
ELECTROTHERAPY- I & II	150	200	350
CLINICS	-	-	550
TOTAL HRS.			1425

Exams:

PAPER NO.	SUBJECT	MARKS				
		THEORY		PRACTICAL		TOTAL
		EXTERNAL	INTERNAL	EXTERNAL	INTERNAL	
1.	PATHOLOGY – MICROBIOLOGY	40 (20 + 20)	10 (05+05)	-	-	50
2.	PHARMACOLOGY	40	10	-	-	50
3.	BIostatISTICS & RESEARCH METHODOLOGY	40	10	-	-	50
4.	EXERCISE THERAPY – II & KINESIOLOGY	80 (56+24)	20 (14+06)	80	20	200
5.	ELECTROTHERAPY- I & II	80	20	80	20	200

T.Y. B.P.T.:

Consisting of 2 semesters (5th and 6th). University exams of T.Y. B.P.T. shall be held at the end of the 6th semester.

SUBJECT	TEACHING HOURS		
	THEORY	PRACTICAL	TOTAL
GENERAL MEDICINE	70	-	70
ENT + OPHTHALMOLOGY	10+5	-	15
RADIOLOGY	20	-	20
PEDIATRICS	20	-	20
DERMATOLOGY	10	-	10
NEURO MEDICINE & NEURO SURGERY	60	-	60
GYNEC & OBS.	30	-	30
GEN.SURGERY+PLASTIC SURGERY	60+15	-	75
C.T. SURGERY	60	-	60
ORTHO - TRAUMATIC	60	-	60
ORTHO NON-TRAUMATIC	60	-	60
PHYSICAL & FUNCTIONAL DIAGNOSIS	100	100	200
CLINICS	-	-	650
TOTAL HRS			1330

Exams:

PAPER NO.	SUBJECT	MARKS				
		THEORY		PRACTICAL		TOTAL
		EXTERNAL	INTERNAL	EXTERNAL	INTERNAL	
1.	MEDICINE - I (GEN MED, PEDIATRICS) + DERMATOLOGY	80 (56+24)	20 (14+06)	-	-	100
2.	MEDICINE - II (NEUROMED)+GYNEC	80 (56+24)	20 (14+06)	-	-	100
3.	GENERAL SURGERY + CT. SURGERY	80 (40+40)	20 (10+10)	-	-	100
4.	ORTHOPEDICS + TRAUMATIC NONTRAUMATIC	80 (40+40)	20 (10+10)	-	-	100
5.	PHYSICAL & FUNCTIONAL DIAGNOSIS	80	20	80	20	200

FINAL YEAR:

Consisting of 2 semesters (7th and 8th). University exams of Fourth Y.B.P.T. shall be held at the end of the 8th semester.

SUBJECT	TEACHING HOURS		
	THEORY	PRACTICAL	TOTAL
PHYSIOTHERAPY IN ORTHOPEDIC CONDITIONS	50	50	100
PHYSIOTHERAPY IN NEUROLOGICAL CONDITIONS	50	50	100
PHYSIOTHERAPY IN CARDIO-PULMONARY CONDITIONS	50	50	100
PHYSIOTHERAPY IN MEDICAL & SURGICAL CONDITIONS	50	50	100
PHYSIOTHERAPY IN REHABILITATION & ALLIED THERAPEUTICS	50	50	100
BIO - ENGINEERING	20	-	20
PRINCIPLES OF ETHICS & ADM.	50	-	50
CLINICS	-	960	960
EDUCATIONAL TOUR AND INSTITUTIONAL VISITS	-	-	88
SEMINAR PRESENTATION, CASE PRESENTATION & CLINICAL DISCUSSION	-	-	162
TOTAL			1760

Exams:

PAPER NO.	SUBJECT	MARKS				
		THEORY		PRACTICAL		TOTAL
		EXTERNAL	INTERNAL	EXTERNAL	INTERNAL	
1.	PHYSIOTHERAPY IN ORTHOPEDIC CONDITIONS	80	20	80	20	200
2.	PHYSIOTHERAPY IN NEUROLOGICAL CONDITIONS	80	20	80	20	200
3.	PHYSIOTHERAPY IN CARDIO-PULMONARY CONDITIONS	80	20	80	20	200
4.	PHYSIOTHERAPY IN MEDICAL & SURGICAL CONDITIONS	80	20	80	20	200
5.	PHYSIOTHERAPY IN REHABILITATION	40	10	40	10	100

STRUCTURE OF QUESTION PAPERS

Subjects:

F.Y. B. Physio: Human Anatomy, Psychology-Sociology, Biomedical Physics and Exercise Therapy-I

S.Y. B. Physio: Electrotherapy I & II

T.Y.B. Physio: Surgery, Orthopedics and Physical & Functional Diagnosis.

Final B. Physio: Physiotherapy In Orthopedic Conditions, Physiotherapy In Neurological Conditions, Physiotherapy In Cardio-pulmonary Conditions & Physiotherapy In Medical-Surgical Conditions.

Duration: 3 Hours

SECTION – I (40 Marks)

Q – 1 Full Question 15 Marks

OR

Q – 1 Full Question 15 Marks

Q – 2 Write Short Notes (3 out of 4) (5 Marks each) 15 Marks

Q – 3 Write Short Notes (2 out of 3) (5 Marks each) 10 Marks

SECTION – II (40 Marks)

Q – 4 Full Question 15 Marks

OR

Q – 4 Full Question 15 Marks

Q – 5 Write Short Notes (3 out of 4) (5 Marks each) 15 Marks

Q – 6 Write Short Notes (2 out of 3) (5 Marks each) 10 Marks

Subjects:

F.Y. B. Physio: Human Physiology & Biochemistry

S.Y. B. Physio: Exercise Therapy II - Kinesiology

T.Y.B. Physio: Medicine I, Medicine II

Duration: 3 Hours

SECTION – I (56 Marks)

Q-1	Full Question		16 Marks
		OR	
Q-1	Full Question		16 Marks
Q-2	Full Question		16 Marks
		OR	
Q-2	Full Question		16 Marks
Q-3	Write short notes on: (3 out of 4) (4 Marks each)		12 Marks
Q-4	Write short notes on: (3 out of 4) (4 Marks each)		12 Marks

SECTION – II (24 Marks)

Q-5	Full Question		16 Marks
		OR	
Q-5	Full Question		16 Marks
Q-6	Write short notes on: (2 out of 3) (4 Marks each)		08 Marks

Subjects:

S.Y. B. Physio: Pathology-Microbiology

Duration: 2 Hours

SECTION – I (20 Marks)

Q – 1 Full Question 10 Marks

OR

Q – 1 Full Question 10 Marks

Q – 2 Write Short Notes (2 out of 4) (5 Marks each) 10 Marks

SECTION – II (20 Marks)

Q – 4 Full Question 10 Marks

OR

Q – 4 Full Question 10 Marks

Q – 5 Write Short Notes (2 out of 4) (5 Marks each) 10 Marks

Subjects:

S.Y. B. Physio: Pharmacology and Biostatistics & Research Methodology

Final B. Physio: Physiotherapy in Rehabilitation

Duration: 2 Hours

Total 40 Marks

Q – 1 Full Question		15 Marks
	OR	
Q – 1 Full Question		15 Marks
Q – 2 Write Short Notes (3 out of 4) (5 Marks each)		15 Marks
Q – 3 Write Short Notes (2 out of 3) (5 Marks each)		10 Marks

F.Y. B. PHYSIOTHERAPY

HUMAN ANATOMY

OBJECTIVES:

At the end of the course, the student will be able to:

- 1) Acquire the knowledge of structure of human body in general.
- 2) Understand the regional anatomy in detail
- 3) Anatomical changes right from embryonic period till old age
- 4) Understand histological features of various organs
- 5) Understand its application in medical science

CONTENTS

General Introduction:

- 1) Definitions and subdivisions
- 2) Plan of human body
- 3) System of the body
- 4) The unit of structure and function of the cell

Histology: (Not For University Examination)

- 1) Cell
- 2) Tissues of the body
- 3) Epithelium
- 4) Connective tissue
- 5) Cartilage
- 6) Bone
- 7) Lymphoid tissue

Embryology: (Not For University Examination)

- 1) Ovum, spermatozoa, fertilization and formation of germ layers and their derivations
- 2) Development of skin, fascia, blood vessels and lymphatics
- 3) Neural tube, brain vessels, spinal cord
- 4) Development of brain and brainstem structures, developmental anomalies (brief)
- 5) Development of bones, axial and appendicular skeleton and muscles

MUSCULOSKELETAL ANATOMY: (all topics to be taught in detail)

Osteology:

- 1) Anatomical positions of the body, axes, planes, common anatomical terminologies (grooves, tuberosity, trochanters etc)
- 2) Connective tissue classification
- 3) Bones:- Composition and functions, classification of types according to morphology and development, growth and repair, structure of long bone, vertebral column, types of vertebrae, bones of extremities and body landmarks

Arthrology:

- 1) Definitions
- 2) Classification of joints
- 3) Construction of joints
- 4) Motions of joints
- 5) Structure of fibrous, cartilaginous joints
- 6) Blood supply and nerve supply of joints
- 7) Articulations – articular surfaces, types of joints, motions of upper and lower extremities, trunk, head

Myology:

- 1) Types of muscle tissue
- 2) Muscles of upper extremity, lower extremity, trunk, eye, face etc. origin, insertion, nerve supply and action (in detail)

Myology of other systems:

- 1) Cardiovascular system
- 2) Blood lymph, tissue fluid-characteristics, composition, and function
- 3) The heart-main arteries, veins, capillaries
- 4) Lymph circulation

Neuro-anatomy

- 1) Division and function of the nervous system
- 2) Brain, spinal cord-their structures, division
- 3) Nerve tissue-neuron, nerve, fibre, synapse, end-organs etc
- 4) Organization of Central Nervous System-spinal nerves and autonomic nervous system-mainly pertaining to cardiovascular, respiratory and urogenital system.
- 5) Cranial nerves
- 6) Peripheral nervous system-Peripheral nerves, sensory and organs, neuromuscular junction, spinal segments and areas
- 7) Nerve supply to voluntary muscles and segmental distribution
- 8) Central nervous system-Brain, cerebellum, Thalamus, Hypothalamus, Corpus striatum, Cerebral hemispheres – white and gray matter, lateral ventricles, blood supply of brain, meninges, pyramidal system, extrapyramidal systems, anatomic integration.
- 9) Cerebro-spinal fluid
- 10) Sensory end-organs and sensations
- 11) Autonomic nervous system-sympathetic, parasympathetic

Respiratory System:

- 1) Thoracic cage
- 2) Brief outline of air passages
- 3) Brief gross anatomy of respiratory organs-lungs, pleura, bronchial tree, broncho-pulmonary segments
- 4) Intercostals muscles in detail
- 5) Mechanisms of respiration and muscles of respiration
- 6) Diaphragm

Cardiovascular System:

- 1) Heart (gross anatomy and functions)
- 2) Arteries
- 3) Veins
- 4) Collateral Circulation

Digestive System:

- 1) Anatomy of digestive organs – Oesophagus, stomach, intestine, rectum etc
- 2) Digestive glands

Urinary System:

- 1) Anatomy of urinary organs, kidneys, ureters, urinary bladder urethra in males and females etc.
- 2) Types of bladder especially in paraplegics

Reproductive System:

- 1) Brief outline of genital organs
- 2) Outline of male and female reproductive system

Endocrine System:

- 1) Glands – classification, sites and section
- 2) Enzymes
- 3) Hormones

Lymphatic System – brief outline

Special sensory organs and sensations:

- 1) Emphasis on skin, ear and eyes
- 2) Less detail on smell and taste

Regional Anatomy:

Upper Extremity:

- 1) Osteology: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges in articulated hand
- 2) Soft parts: Breast, pectoral region, axilla, front of arm, cubital fossa, front of forearm, back of forearm, palm, dorsum of hand, muscles, fascia, nerves, blood vessels and lymphatic drainage of upper extremity
- 3) Joints: shoulder girdle, shoulder joint, elbow joint, radio-ulnar joint, wrist joint and joints of hand
- 4) Arches of hand, skin of the palm and dorsum of hand

Lower Extremity

- 1) osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals, phalanges.
- 2) Soft parts: Gluteal region, front and back of thigh {femoral triangle, femoral canal and inguinal canal}, medial side of the thigh {adductor canal}, lateral side of the thigh, popliteal fossa, anterior and posterior compartment of leg, sole of the foot, lymphatic drainage of lower limb, venous drainage of the lower limb, arterial supply of the lower limb, arches of the foot, skin of foot.

Trunk

- 1) Osteology: Cervical, thoracic, lumbar, sacral and coccygeal vertebra and ribs.
- 2) Sift tissue: Pre and para vertebral muscles, anterior abdominal wall muscles, intervertebral disc.
- 3) Joints: Hip joint, knee joint, ankle joint, joints of the foot.

Head and neck

- 1) osteology: Mandible and bones of the skull.
- 2) Soft parts: Muscles of the face and neck and their nerve and blood supply – Extraocular muscles, salient points about the eye ball and internal ear.

HUMAN PHYSIOLOGY

Objectives:

At the end of the year the student will be able to:

- 1) Acquire the knowledge of functions of various systems of human body
- 2) Understand the role of hormones, enzymes and other different types of cells of Human body.

GENERAL PHYSIOLOGY:

1. Cell Structure and Organelle.
2. General Principles of Biophysics
3. Body Fluid Compartments.

Blood:

1. Composition of Blood, Plasma, Protein Formation and their Function.
2. Structure, formation and functions of R.B.C.
3. Structure, formation and functions of W.B.Cs. and platelets.
4. Coagulation and its defects of bleeding and clotting time.
5. Blood Groups and their significance, Rh. Factor.
6. Reticulo-endothelial system, Jaundice, Structure and functions of spleen.
7. Hemoglobin and E.S.R.

Cardiovascular System:

1. Structure, properties of heart muscle and nerve supply of heart structure and function of arteries, arterioles, capillaries and veins.
2. Cardiac cycle and heart sounds.
3. Cardiac output measurement, factors affecting.
4. Heart rate and its regulation, Cardiovascular reflexes.
5. Blood pressure, its regulations and physiological variations.
6. Peripheral resistance, factors controlling and its role in B.P.
7. Hemorrhage.
8. Changes in muscular exercise.

Respiratory System:

1. Mechanism of respiration, intra-pleural and intrapulmonary pressure.
2. Lung volumes and capacities.
3. O₂ and CO₂ carriage and their exchange in tissues and lungs.
4. Nervous chemical regulation of respiration – Respiratory Centers.
Respiratory states – Anoxia, Asphyxia, Cyanosis, and Acclimatization.

Digestive System:

1. General outline and salivary digestion.
2. Gastric secretion and its mechanism of secretion and functions.
3. Digestion, Absorption and Metabolism of Proteins
4. Structure, Secretions and Function of Liver

Nutrition:

1. Digestion, Absorption and Metabolism of Carbohydrates.
2. Digestion, Absorption and Metabolism of Fats.
3. Digestion, Absorption and Metabolism of Proteins.
4. Vitamins, its sources, functions and resources.
5. Balanced diet in different age groups and occupation.

Endocrines:

1. Anterior Pituitary.
2. Posterior Pituitary and Parathyroid.
3. Thyroid.
4. Adrenal Cortex.
5. Adrenal Medulla, Thymus
6. Pancreas and Blood sugar regulation.

Reproductive System:

1. Sex determination and development, Puberty.
2. Male sex hormones and their functions, spermatogenesis.
3. Female sex hormones and functions, menstrual cycle, ovulation and contraceptives.
4. Pregnancy, functions of placenta and lactation.

Excretory System:

1. Gross and minute structure of Kidney and features of Renal circulation.
2. Mechanism of formation of Urine, GFR and Tubular function.
3. Renal function.
4. Physiology of Micturition.

NEURO MUSCULAR PHYSIOLOGY:**Muscle and Nerve:**

1. Structure of Neurons, membrane potential and generation of action potential.
2. Nerve impulse conduction, Saltatory conduct ion.
3. Neuromuscular junction and drugs acting on it – Myasthenia.
4. Degeneration and regeneration in peripheral nerves – Wallerian degeneration of electro tonus and Pflagers Law.

Muscle:

1. Type of muscles and their gross structure, stimulus chronaxie, strength duration curve.
2. Structure of sarcomere – Basis of muscle contraction, Starling's Law and changes during muscle contraction.
3. Electrical – Biphasic and monophasic action potentials.
4. Chemical, Thermal and Physical changes, isometric and isotonic contraction.
5. Motor units and its properties, Clonus, Tetanus, All or None Law, Beneficial Effect.
6. Nature of Voluntary contraction, Fatigue.

Nervous System:

1. Types and properties of Receptors, types of sensations.
2. Structure of Synapses, Reflex and its properties, occlusion summation, sub minimal fringe, etc.
3. Tracts of Spinal Cord.
4. Descending, Pyramidal and Extra pyramidal Tracts.
5. Hemi section and complete section of spinal cord, upper and lower motor neuron paralysis.
6. Cerebral cortex – areas and functions, E.E.G.
7. Structure, connections and functions of Cerebellum.
8. Connections and functions of Basal Ganglia and Thalamus.
9. Reticular formation, tone, posture and equilibrium.
10. Autonomic nervous system.

Special Senses:

1. Broad features of Eye, errors of refraction, lesions of visual pathways.
2. Speech and its disorders.
3. Ear and vestibular apparatus.

PRACTICAL AND DEMONSTRATIONS**Blood:**

1. Haemoglobinometer and total R.B.C. count.
2. Total W.B.C. count
3. Preparation and staining of blood smears, determination of differential W.B.C. count.
4. Blood grouping
5. Erythrocyte sedimentation rate
6. Bleeding and clotting time.

Respiratory System:

1. Artificial respiration.
2. Pulmonary function test

Cardiovascular System:

1. Heart Sounds
2. Arterial Blood Pressure in Man.
3. Cardiac efficiency tests.
4. Recording and study of E.C.G.

Central Nervous System:

1. Testing of peripheral sensations and cranial nerves.
2. Superficial and deep reflexes.
3. Tests for Cerebral and Cerebellar functions

Neuromuscular System:

1. Varieties of stimuli
2. Electrical Apparatus for physiological experiments.

BIOCHEMISTRY:

Objectives:

At the end of the course the candidate will be able to

1. Describe the structure and function of the cell in brief.
2. Describe the normal functions of different components of food.
3. Describe basal metabolic rate and the factors affecting the same (in brief) with special reference to obesity.
4. Discuss nutritional aspects of carbohydrates, lipids, proteins, vitamins and minerals and their metabolism with special reference to obesity.
5. Define enzymes and discuss in brief the factors affecting enzyme activity and diagnostic use of enzymes.
6. Describe in detail the biochemical aspects of muscle contraction.
7. Acquire knowledge in brief about the clinical biochemistry, with special reference to liver and renal function tests, blood study for lipid profile, metabolism of fat, carbohydrates, proteins, bone minerals, electrolyte balance, water balance and acid – base balance.

Cell Biology:

1. Membrane structure and function.
2. Function of intracellular organs in brief.

Carbohydrates:

1. Chemistry, definition, classification with examples
2. Function of mucopolysaccharide (in detail)
3. Reducing properties of sugars of clinical and diagnostic importance (e.g. Benedict's test, Barfoed's test, etc)
4. Metabolism, digestion and absorption of carbohydrates, glycosis – aerobic and anaerobic, energetics and regulation.
5. Kerbs's cycle, its energetics regulation and role of TCA cycle
6. Glycogenesis, Glycogenolysis, their regulation and the role of liver and muscle glycogen
7. Significance of HMP shunt and gluconeogenesis
8. Hormonal regulation of blood sugar level, important metabolic disorders of glycogen, lactose intolerance, diabetes mellitus.

Proteins:

1. Chemistry, definition, classification of amino – acids, protein structure, effect of temperature on proteins, denaturation, coagulation, isoelectric pH and its importance.
2. Metabolism, digestion and absorption, decarboxylation, deamination, transmethylation, transamination and their importance and detoxification of ammonia including urea cycle.
3. Special products of amino acids, example: phenylalanine, glycine, methionine
4. Neurotransmitters
5. Plasma proteins including immunoglobulins
6. Hemoglobin, Myoglobin, their functions, haemoglobinopathies, thalassemias
7. Structural proteins: Collagen, Elastin

Lipids:

1. Chemistry, definition, classification and function
2. Metabolism, digestion and absorption of lipids, beta oxidation of fatty acids and its energetics, regulation of fat metabolism in adipose tissue, ketone bodies formation and its utilization, cholesterol and importance of lipoproteins, lipoproteinemia with atherosclerosis – causes and prevention, fatty acid synthesis, fatty liver and obesity.

Nucleic Acids:

1. DNA, RNA – definition, structure and function, types, genetic code, catabolism of purines – gout.

Enzymes:

1. Definition, classification, factors
2. Coenzymes.
3. Inhibition and type of inhibitors
4. Isoenzymes
5. Clinical and therapeutic uses of enzymes

Vitamins:

1. Definition, classification, functions
2. Deficiency symptoms, RDA

Biological Oxidation:

1. Oxidative phosphorylation, ETC

Minerals:

1. Phosphate, calcium and iron (in details)
2. Magnesium fluoride, Zinc, Copper, Selenium, Molybdenum
3. RDA, iodine sources, absorption, transport, excretion, function and disorders
4. Acid – base balance, water and electrolyte balance

Connective tissue:

1. Biochemistry of connective tissue – Collagen, Glycoprotein, Proteoglycans

Nutrition and BMR, PEM, Balance diet.

PSYCHOLOGY

Objectives:

At the end of the course the candidate will be able to

1. Define the term psychology and its importance in the health delivery system and gain knowledge of psychological maturation during human development and growth and alteration during ageing process
2. Understand the importance of psychological status of the person in the health and diseases, environmental and emotional influence on the mind and personality
3. Acquire the knowledge as to how to deal with the patient

Reference should be made whenever appropriate to the therapist relationship with the patient and with his professional colleagues. Emphasis should be laid on the effects of disease on the patient's behavior.

1. **Biological foundation** of behavior, hereditary and environment and logical basis for development, developmental psychology (child).
2. **Learned and unlearned behavior:** Simple learning and conditioning, social learning.
3. **Thinking and intelligence:** Learning and problem solving development of conceptual thinking in children. Communication, language and thinking. Measurement of intelligence influences on intelligence, extent and consequence of individual differences.
4. **Perception:** Sensory basis of perception, attention and perception, observer error.
5. **Memory:** Phases of memory, short term storage, memory and perception thinking etc. Forgetting testimony and recall of events, memory and ageing.
6. **Motivation and emotion:** Approaches to motivations, emotion, development, influence of early experience. Family and social influences on motivation and behaviour.
7. **Personality:** Nature of personality structure and dynamics, dimensional, psychoanalytical and constitutional theories of personality, measurement of personality, culture and personality patterns.
8. **Attitude:** Nature of attitude and beliefs including prejudice, group influences on attitudes, attitude change, doctor – patient expectations and attitude, prejudice formation and education.
9. **Interpersonal behaviour:** Experimental analysis on social interaction, studies of the interview situation, behaviour in formal and informal groups, group norms and rules. Leadership in formal and informal groups, group morale.
10. **Social psychology:** Nature and scope of social psychology, social interaction, psychological groups and their classification, socialization of the individual, social control (social hierarchy) – moves, customs, fashion, propaganda and its techniques.
11. **Tests:** Wescher scales, Stanford-Binet intelligence scale, Bender and Gestalt-other projective test, anxiety scale.

SOCIOLOGY

Objectives:

At the end of the course the candidate will be able to

1. Define the term sociology and its importance in the health delivery system.
2. Understand the basic sociological concepts, principles and social process, social institution in relation to the individual family and community and the various social factors affecting the family in the rural and urban communities in India.

Introduction:

1. Meaning – definition and scope of Sociology.
2. Its relation with anthropology, psychology, social psychology and ethics.
3. Methods of Sociology – case study, social survey, questionnaire interview and opinion poll methods.
4. Importance of its study with special reference to health care professionals.

Social Factors in health and disease:

1. The meaning and nature of socialization.
2. The role of social factors in health and illness.

Socialization:

1. Meaning and nature of socialization.
2. Primary, secondary and anticipatory socialization.
3. Agencies of socialization.

Social Groups:

Concepts of social groups, influence of formal and informal groups on health and sickness, the role of primary groups and secondary groups in the hospital and rehabilitation settings.

Family:

1. The family
2. Meaning and definition
3. Function
4. Types
5. Changing family patterns
6. Influence of family on individual health, family and nutrition, the effects of sickness on family and psychosomatic disease and their importance to physiotherapy.

Community:

1. Rural community – meaning and features – health hazards of rural ties.
2. Urban community – meaning and features – health hazards of urbanities.

Cultural and Health:

1. Concept of culture.
2. Culture and behavior.
3. Cultural meaning of sickness.
4. Cultural and Health Disorders.

Social Change:

1. Meaning of social changes.
2. Factors of social changes.
3. Human adaptation and social change.
4. Social change and stress.
5. Social change and deviance.
6. Social change and health programme.
7. The role of social planning in the improvement of rehabilitation.

Social Problems of disabled:

Consequence of the following social problems in relation to sickness and disability, remedies to prevent this problem.

1. Population explosion.
2. Poverty and unemployment.
3. Beggary.
4. Juvenile delinquency.
5. Prostitution.
6. Alcoholism
7. Problems of women in employment

Social Security:

Social security and social legislation in relation to disabled.

Social Worker:

Meaning of Social work, role of a medical social worker.

BIOMEDICAL PHYSICS (FUNDAMENTALS OF PHYSIOTHERAPY):

Objectives:

At the end of the course the candidate will be able to:

1. Recall the physics principles & Laws of Electricity, Electro-magnetic spectrum & ultra-sound.
2. Describe effects of environmental & man made electro-magnetic field at the cellular level & risk factors on prolonged exposure.
3. Describe the main electrical supply, electric shock – precautions.
4. Enumerate types & production of various therapeutic electrical currents. Describe the panel diagrams of the machines.
5. Describe in brief, certain common electrical components such as transistors, valves, capacitors, transformers etc & the simple instruments used to test / calibrate these components (such as potentiometer, oscilloscope etc) of the circuitry; & will be able to identify such components.
6. Describe & identify various types of electrodes used in therapeutics, describe electrical skin resistance & significance of various media used to reduce skin resistance.
7. Acquire knowledge of various superficial thermal agents such as Paraffin wax bath, cryotherapy, homemade remedies, etc; their physiological & therapeutic effects, merits / demerits; & also acquire the skill of application.

Syllabus:

1. Fundamentals of Low frequency currents:
 - a) Production of electricity, mains supply,
 - b) A.C. currents & Faradic type current
 - c) D.C. currents – Types, Fundamentals of electrical charges, static electricity, physics of direct currents Ohm's law, Conductors, Capacitors, Rheostats, Potentiometers, Ammeters & Oscilloscopes,
 - d) Types of electrodes, galvanic skin resistance, electrode, gels, types & significance
2. Fundamentals of High frequency currents:
 - a) Magnetism, E.M.F. Conduction, Lenz's Law, transformers, types.
 - b) Thermionic valves.
 - c) Semi-conductors: types, transistors
 - d) Electronic circuits– oscillators, pulse generators
3. E.M. spectrum: Laws of transmission- reflection, refraction, absorption, attenuation; Grothus' law, cosine law, inverse square law and its practical application
4. Cellular Bio-physics: Reception & emission of E.M.F. signals.
5. Environmental currents & fields risk factors on prolonged exposure to E.M. field.
6. Production, Physical principles, Panel diagram, testing of apparatus – S.W.D., Ultra-sound, U.V.R., I.F.T., Beat frequency currents, I.R., LASER (no panel diagram).

7. Therapeutic continuous / interrupted direct currents & their various wave forms, A.C. current.
8. Bio-physics of superficial heat & cold (Only basic principles):
 - a) Home remedies,
 - b) Paraffin wax bath
 - c) Whirl pool
 - d) Contrast bath
 - e) Hydro-collator hot packs / cold packs
 - f) Cryotherapy
9. Basic Concepts:
 - a) COG, LOG, Planes and axis of motion (mechanical and anatomical)
10. Principles of stability:
 - a) BOS, Height, COG, LOG, Mass of body, the impact of forces, Friction, Segmentation, Visual factors, Psychological and Physiological factors.
11. Principles of motion:
 - a) Causes of motion, Kinds, Motions experienced by the body, Laws of motion, Centripetal and Centrifugal force.
12. Musculoskeletal mechanics:
 - a) Anatomical levers, Wheel and axis and Pulley
13. Force and work:
 - a) Magnitude of force, Point of application, Direction of force and Resistance, Arm of lever, Perpendicular distance, Composite effect of two or more forces, Methods of determining the components of force and work, Movements of body as a whole and of segments of body in air, water and on surface.

Text Books:

1. Clayton's Electro therapy – 3rd & 10th Ed,
2. Electrotherapy explained – by Low & Read
3. Electro Therapy – by Kahn
4. Basics of Electrotherapy – Dr. Subhash Khatri
5. Kinesiology - Katharine F. Wells

Reference book:

1. Clinical Electrotherapy – by Nelson & Currier.

EXERCISE THERAPY – I

Objectives:

At the end of the year the student will be able to

1. Understand the basic mechanical principles and effect of exercise, therapeutic modality in the restoration of physical function.
2. Describe and acquire the skills of application and demonstration of the use of various tools of the therapeutic gymnasium and various starting and derived positions.
3. Describe the physiological and therapeutic effect of various movements and demonstrate in various anatomical planes.
4. Acquire the skills of application of various massage manipulations and describe the physiological effects, therapeutic uses, merits – demerits of the same.
5. Demonstrate and acquire the skill of relaxation.

General Mechanical Principles:

1. Mechanical principles applied in Physiotherapy like force, momentum, torque etc.
2. Momentum action and reaction, friction, rotation about a pivot, angle or pull of muscle.
3. Gravity: Definition, line of gravity, centre of gravity.
4. Equilibrium: supporting base, stability and uses.
5. Work, energy and power.
6. Lever: Definition, orders of lever, examples in human body, levers at home and work; levers in Physiotherapy.
7. Springs: Properties of springs, springs in series and parallel.
8. Mechanics of muscle: Group action of muscles, types of contraction, muscle work.

Exercise therapy – I:

1. Introduction to Physical Therapy.
2. Basic of exercise: Physiological effects and Therapeutic uses of exercises
Psychogenic aspects of exercises
Pharmacological effects of exercises
3. Use of apparatus in Exercise Therapy.
4. Joint movements – Terminology, angle of motion, axis and planes of movement, levers.
5. Fundamental starting positions, derived positions – effects and uses and muscle work
6. Pelvic tilt.
7. Muscle work for all positions.
8. Measurement of joint movements/ Goniometry – principles of goniometry, types (Bubble and gravity goniometers), method for measuring each movement.
9. Classification of movements:
Active movements: Definition, types, effects and uses techniques.
Passive movements: Definition, types, effects and uses, techniques of relaxed
Passive movements and comparison of both movements.
10. Causes for restriction of range of motion – Distinguish between skin, muscle, capsular contractures.
11. Group work – Criteria for selection of patients, advantages and disadvantages of group therapy / class exercise.
12. Posture – Definition, types, factors influencing posture, posture training, physiological deviations.
13. Free exercises – Classification, techniques, therapeutic effects of free exercises, application for shoulder, neck, hip and knee joints.

14. Suspension therapy – Definition and concepts of suspension
 - Points of suspension
 - Weight & pulleys and application of pulleys for suspension
 - Application of suspension therapy either to increase the Joint range or muscle power
15. Resisted Exercises – Techniques and types of resistance
 - SET system (Heavy resisted exercises, Oxford method, Delorme method, McQueen's method.)
 - Application of resistance to increase power and endurance
 - Progress of exercises: Free, resisted-assisted-with use of apparatus.
16. Mat Exercises – Principles
 - Equilibrium / balancing exercises
 - Transfer activities
 - Indications and contraindications
17. Evaluation methods – principles – techniques – merits/demerits
 - Individual and group muscles
 - Limb length and girth
 - Posture and gait
18. Locomotion – Normal gait, gait training
 - Training with supportive aids: principles, selection of aid, pre-crutch training, Crutch walking, progression.
 - Walking on slopes, staircase climbing, transport with walking aids
19. Breathing exercises – Mechanism of breathing, muscles of respiration
 - Diaphragmatic and segmental breathing
 - Principles and techniques
 - Therapeutic effects
 - Exercises for bronchial hygiene, coughing and huffing, home programme
20. Assessment of sensation, reflex testing, blood pressure, pulse rate, chest expansion and respiratory rate
21. Maintenance of record – range of motion, resistance
22. Trick Movements
23. Home Exercises

Soft Tissue Manipulation – Massage Mobilization:

1. Introduction – brief history, definition, classification
2. Physiological effects and therapeutic uses
3. Indications – contraindications
4. Preparation of patient, basic points to be considered during the treatment
5. Specific techniques, effects and uses of each manipulation
6. Massage techniques for upper and lower limbs, neck and back.
7. Massage for edema, scar, tendonitis, fibrosis (tight fascias)
8. Practice of soft tissue manipulation in subjects.
9. Mobilization of soft tissues, joints and fluid collection.

COMPUTER APPLICATIONS

(Not for University Exam)

The course enables the students to understand the fundamentals of computer and its basic applications.

Introduction to data processing:

- Features of computers. What are Hardware and Software?
- Advantages of using computers. Role and uses of computers. What is data processing?
- Application areas of computers and common activities in data processing. Types of data processing, characteristics of application.

Hardware concepts:

- Architecture of computers – characteristics of discs, tapes, terminals, printers, network.
- Types of storage devices.
- Concept of damage. Application of networking concept of PC system care, floppy care, data care etc.

Concept of software

- Classification of software: System software. Application of software, Operating System, Computer System, computer virus, precautions against viruses, dealing with viruses, computers in medical electronics.

Basic anatomy of Computers:

- Principles of programming: Computer application – principles in scientific research, work processing, medicine, libraries, museum, education, information system.
- Data processing
- Computers in Physical Therapy – Principles of EMG, Exercise testing equipment, Laser.

ENGLISH

(Not for University Exam)

Course Outline:

The course is designed to help Acquire a good command and comprehension of the English language through individual papers and conferences.

Objectives:

At the end of the course the candidate will be able to

1. Read and comprehend English language.
2. Speak and write grammatically correct English.
3. Appreciate the value of English language in personal and professional life.

Introduction:

- Study techniques
- Organization of effective note taking and logical processes of analysis and synthesis.
- Use of the dictionary
- Enlargement of vocabulary
- Effective diction

Applied Grammar:

- Correct usage
- The structure of sentences
- The structure of paragraphs
- Enlargement of vocabulary

Written composition:

- Precise writing and summarizing
- Writing of Bibliography
- Enlargement of vocabulary

Reading and Comprehension:

- Review of selected materials and express oneself in one's words and enlargement of vocabulary.

The study of various forms of composition:

- Paragraph, essay, letter, summary, practice in writing

Verbal Communication:

- Discussions and summarization, debates, oral reports, use in teaching.

S.Y.B.PHYSIOTHERAPY

PATHOLOGY:

Objectives:

At the end of the course the candidate will be able to:

1. Acquire the knowledge of concepts of cell injury and changes produced thereby in different tissues and organs; capacity of the body in healing process.
2. Recall the etio-pathogenesis, the pathological effects and the clinico-pathological correlation of common infection and non infectious disease.
3. Acquire the knowledge of concepts of neoplasia with reference to the etiology, gross and microscopic features, diagnosis and prognosis in different tissues and organs of the body.
4. Correlate normal and altered morphology of different organ systems in different diseases needed to understand the disease process and their clinical significance (with special emphasis to neuro musculo skeletal and cardiovascular – respiratory system).
5. Acquire knowledge of common immunological disorders and their resultant effects on the human body.
6. Understand in brief, about the hematological diseases and investigations necessary to diagnose them and determine their prognosis.

General Pathology:

1. Introduction: Aims and objects of study of pathology, definitions of health, disease, causes of disease, methods of study of disease.
2. Inflammation – General morphology, types, phenomenon of acute inflammation.
3. Tissue repair – Wound healing, fracture, skin, nerves, muscles
4. Cell Injury – Degeneration, physical and chemical irritants, ionizing radiations, cellulites.
5. Disturbance of circulation – edema, thrombosis, infarction, embolism.
6. Necrosis, Gangrene
7. Growth and its disorders – atrophy and hypertrophy (pseudo).
8. Cellular ageing
9. Tumors – definitions, classification, characteristics of benign and malignant tumors, etiology and spread of tumors, systemic effects.
10. Infection – Acute, chronic, including AIDS.
11. Blood-Anemia, definition, classification, etiology, lab investigations, blood picture; Hemorrhagic disorders – causes and classification (hemophilia)
12. Immunity and Hypersensitivity

Systemic Pathology: (Each condition in this section is to be taught under the specific headings of Causes, Development, Gross and Microscopic only).

Respiratory System	Pneumonia, Bronchitis, Bronchiectasis, Asthma, Emphysema, Tuberculosis and Carcinoma of Lungs Occupational Lung Diseases
Cardiovascular System	Rheumatic Heart diseases, Myocardial infarction, Atherosclerosis and other disease of blood vessels – TAO, Buerger's diseases, Thrombophlebitis Congenital Heart diseases,
Alimentary System	Peptic Ulcer Ulcerative lesions of intestine

Liver	Hepatitis, Cirrhosis
CNS	Meningitis, Encephalitis, Cerebral Hemorrhage, CVA, Brief outline of CNS Tumors
Peripheral Nerves	Neuritis, Neuralgia, GBS, Neuropathies.
Bones and Joints	Osteomyelitis, Osteoarthritis, Septic, Arthritis, Gout, Osteomalacia, Bone Tumors briefly-Giant Cell tumor, Osteosarcoma, Ewing's Only, Hemarthrosis.
Muscles	Disorder of muscles including Poliomyelitis and Myopathies, Volkman's Ischaemic contracture
Skin	Scleroderma, Psoriasis, Autoimmune disorders
Urinary System	Nephritis, Glomerular Nephritis, Nephrotic Syndrome
Endocrine System	Thyroid – Thyroiditis and Thyroid tumors, Diabetes

MICROBIOLOGY:

Objectives:

At the end of the course the candidate will be able to have sound knowledge of the agents responsible for causing human infections pertaining to CNS, CVS, musculoskeletal and Respiratory system.

General Bacteriology:

1. Introduction, historical background, classification of micro – organisms
2. Morphology of bacteria
3. Staining of bacteria
4. Sterilization
5. Cultivation and culture media

Systemic Bacteriology:

1. Gram-Positive cocci – Streptococci, Pneumococci, Staphylococci
2. Gram-Negative Cocci – Gono and Meningo cocci
3. Gram-Positive Bacilli
4. Gram-Negative Bacilli-Typhoid, Cholera, Dysentery
5. Aerobic-Diphtheria, T.B., Leprosy
6. Anaerobic-Tetanus, Gas Gangrene, Botulism

Immunology:

1. Immunity, Antigens
2. Antibodies, Ag-Ab Reaction
3. Agglutination, precipitation
4. Hypersensitivity reactions

General Virology:

1. Poliomyelitis
 2. Rabies
- Demonstration of test in: diagnosis of AIDS, Hepatitis and Syphilis

Parasitology:

1. Malaria
2. Amoebiasis
3. Round worm and loop worm

Mycology:

1. Candidiasis
2. Ring worm
3. Scabies

PHARMACOLOGY

Objectives:

At the end of the course the candidate 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 and route of administration.
2. Identify whether the pharmacological effect of the drug interferes with the therapeutic response of physiotherapy and vice versa
3. Indicate the use of analgesics and anti-inflammatory agents with movement disorders, with consideration of cost efficiency and safety for individual needs.
4. Get the awareness of other essential and commonly used drugs by patients. The basis of their use and common as well as serious adverse reaction.

Syllabus:

- Chemical character and general action of drugs
- Principles of drug administration and routes of administration, distribution, metabolism, excretion of drugs, factors influencing drug reaction, dosage and factors modifying it.
- Drug toxicity including allergy and idiosyncrasy.
- Definition, action, indication, contraindication, adverse reaction of the following:
 - a. Drugs acting on PNS: stimulating and inhibiting, cholinergic and anticholinergics. Drugs acting at NM junction. Muscle relaxants, alcohol
 - b. Drugs acting on CNS: Analgesics, antipyretics, narcotics, anti-inflammatory, anti-epileptic, sedatives, hypnotics, tranquilizers, anticonvulsants, stimulants, psychotherapeutics.
 - c. Pulmonary effects of general and local anesthetic agents
 - d. Drugs acting on CVS: antihypertensive, vasoconstrictors, vasodilators, diuretics, mucolytic agents. Drugs that influence myocardial contractility and heart rate.
 - e. Drugs acting on Respiratory system: bronchodilators, drugs used in inhalation therapy, drugs acting on CNS and cardio-respiratory system which influence physical exercise.
 - f. Antimicrobial Agents
 - g. Immunological agents and vaccines
 - h. Chemotherapeutic agents
 - i. Endocrine Pharmacology: thyroxine, glucocorticoids, anabolic steroids, calcitonin, insulin and hypoglycemic agents
 - j. The vitamins
 - k. Irritants, counterirritants, plasters, poultices and pastes
 - l. Diagnostics.

BIostatISTICS AND RESEARCH METHODOLOGY

Biostatistics:

1. Introduction to biostatistics, why statistics?
2. Data: What is data? Quantitative and qualitative data, presentation of data with practical exercises.
3. Measures of central tendency: mean, median, mode, arithmetic and geometric mean.
4. Sampling: Why sampling? Methods of sampling and concepts of sample size
5. Measures of variability
6. Standard deviation, co efficient of variation, normal distribution
7. Measures of variability, standard error and its significance, limitations.
8. Statistical tests, X² test, standard error of proportions, difference of proportions
9. Mean and difference of mean
10. Concept of Z, χ^2 and t
11. Values, co efficient of correlation

Research Methodology:

1. What is research? Why research?
2. Types of epidemiological studies and measurements of various indications
3. Possible errors that may generate due to study design and how to overcome them
4. How and what to read from journals?

EXERCISE THERAPY II AND KINESIOLOGY

Objectives:

At the end of the course the candidate will be able to

1. Describe the biophysical properties of connective tissue and the effect of biomedical loading and factors which influence the muscle strength and mobility of articular and periarticular soft tissue.
2. Acquire the skill of assessment of isolated and group muscle strength subjectively and objectively.
3. Analyze normal human posture and its associated problems, its management.
4. Analyze the various normal musculoskeletal movements during breathing, gait and daily living activities and in terms of biomechanical and physiological principles.
5. Describe and demonstrate various therapeutic exercise with its technique: including chest P.T. on self and also acquire the skill of application on model.
6. To demonstrate general fitness, exercise and shall gain fitness for oneself

EXERCISE THERAPY II:

1. Passive movements: Definition, types, technique, effects and uses, CPM unit, comparison of active with passive movements for all joints of extremities, neck and trunk.

Stretching: Definitions related to stretching, types of contractures and differentiation properties of soft tissues affecting elongation and aims of stretching, manual and mechanical stretching, cycle mechanical stretching, indications and aims of stretching, principles and contraindications, MFR(Myo Fascial Release)

Traction: types, effects, principles of application for cervical and lumbar spine, traction to soft tissues of joints – gliding movements

2. Mobilization: causes of restriction of R.O.M., prevention of restrictions, techniques of mobilization of various joints of limbs to mobilize joint R.O.M. through functional diagonal patterns, joint mobilization; manipulation-definition, types; joint shapes, types of motion; stretching, glides, compression, traction, indications, contraindications, precautions and conditions for special precautions.

3. M.M.T.: need of M.M.T., uses, fundamental principles, anatomical and physiological basis, Oxford scale of muscle gradation, principles of isolation, substitution, stabilization, grading procedure for muscles of extremities, neck and trunk.

Voluntary control of movements gradation by Bobath, Brunnstrom.

4. Posture, types, factors influencing posture, regulation of posture and posture mechanism, pelvic tilt and postural deviations of spine and its treatment

Crawling exercises: principles, types, effects and uses of Clapp' crawl

5. Strengthening of muscles(PRE): Principles involved to prevent muscle wasting, Rood's technique of initiating muscle contraction, progressive strengthening of muscles (loads assisted and resisted exercises), use of equipments, reeducation of muscles and restoration of functions, practice of strengthening of muscles of limbs, neck, trunk and face, emphasis on hand and foot muscles, quadriceps, glutei, triceps, deltoid and face muscles, use of manual and mechanical resistance, contraindications, isometric and isokinetic exercises regime, plyometrics, MET (Muscle Energy Techniques)

6. Proprioceptive Neuromuscular Facilitation: Introduction, responses of NM mechanism, basis techniques of PNF patterns of arm, leg, neck, head and trunk (emphasis on straight patterns), specific techniques of emphasis-repeated contractions – slow reversal, contract and relax, hold and relax, rhythmic stabilization, inhibitory techniques, Bobath Rood's and Kabat.
7. Relaxation: muscle tone, postural tone, general and local relaxation techniques of relaxation
8. Neuro Muscular coordination: Factors governing co ordination, principles of re education, Frenkel's exercises and its techniques
9. Functional Reeducation: Mat activities for re education of hemiplegics, paraplegics and cerebral palsy, walking re education in neurological and orthopedic conditions.
10. Aerobic exercises: Physiological effects and therapeutic uses, fitness testing, stress testing for healthy and convalescent individuals.
11. Breathing exercises: Mechanisms of normal breathing, muscles of respiration, changes in thoracic cage during the process of respiration, segmental and diaphragmatic breathing exercises, pursed lip breathing, FET, breathing mechanisms and postural drainage, assistive measures, techniques, indications and contraindications
12. Hydrotherapy: physiological properties of water and hydrodynamics, physiological and applications of Bad Ragaz Technique, indications and contraindications

KINESIOLOGY:

Application of

1. Mechanics of joint motion:

- a) Structure and types of joints and types of movements

2. Mechanics of muscular action:

- a) Classification of muscles, line of pull, types of contractions, role of muscles and tendons, action of two joint motions, non customary action

3. Skilled Movements:

- a) Rope climbing, cycling, running, ballistic and volitional movements

4. Impetus:

- a) Impetus to external objects and receiving impetus

5. Locomotion:

- a) Normal gait analysis: definition of gait, phases of normal gait, normal gait with kinetic and kinematics, abnormal pathological gaits, gait training

6. Biomechanics of joints:

- a) Kinetics, kinematics and patho-mechanics of joint – hip , knee, ankle, foot, shoulder, elbow, wrist and hand

7. Biomechanics of spinal column:

- a) Spinal curves, articulations, non contractile soft tissue of column, IV disc, ligaments, intrinsic equilibrium, movements of spinal column and muscle mechanics

8. Mechanics of pelvic complex:

- a) Pelvis at rest, in standing body and in motion, patho-mechanics of pelvis

9. Mechanics of thorax:

- a) Movements between ribs and vertebrae, sternum and ribs, patho-mechanics of respiration

10. Postural strain and occupational hazards:

- a) Correct use of body mechanics at home, at school and work, recreation, particular application for patients, physiotherapists and other staff.

11. Kinetics and kinematics of ADL

- a) Supine to sitting, Sitting to standing, Squatting, Climbing up and down, pushing, pulling, overhead activities, walking, running, jogging

ELECTROTHERAPY I

Objectives:

At the end of the course the candidate will be able to

1. Describe the production and physiological effects, therapeutic uses, merits, demerits, indications and contraindications of high frequency modes
2. Describe the physiological effects and therapeutic uses of various topical pharmacotherapeutic agents to be used for the application of sono/phonophoresis
3. Acquire the skill of application of the electrotherapy modes on models for the purpose of treatment
4. Acquire the ability to select the appropriate mode as per the tissue specific and area specific application

Syllabus:

Infra Red Rays-

Production of IR rays, luminous and non-luminous generators, penetration, technique of application, physiological effects and therapeutic uses, duration and frequency of treatment, indications and contraindications, dangers and precautions

Ultra Violet Rays –

Production of UVR – mercury vapour lamps (Kromayer lamp), fluorescent tubes (Alpine sun lamp), Theraktin tunnel and PUVA apparatus; physiological effects of UVR-chemical reactions with skin structure of skin, penetration and absorption of UVR Erythema-different degree of erythema, test does, technique to find out the test dose and its importance

Technique of application of UVR, local and general irradiation, specific conditions like psoriasis, acne, alopecia and indolent wounds

Technique of application using accessories

Filters, sensitizers

Dangers and contraindications

Cryotherapy –

Physiological effects and therapeutic uses, techniques of application and contraindications

Hydrotherapy –

Properties of water buoyancy, effects of buoyancy on movements, Hubbard tank, contrast bath and whirlpool bath

Superficial Heat Modalities –

Paraffin Wax Bath: Structure of the bath, composition of wax and mineral oils, physiological effects and therapeutic uses

Other heating modalities: heating pad, moist heat and fluidotherapy

High Frequency Current –

Short Wave Diathermy:

Introduction, therapeutic uses and physiological effects, methods of application (capacitor field method and cable method etc.) Techniques of treatment, indication, contraindication and dangers

Pulsed SWD –

Definition, characteristics, mechanism of work, physiological effects and therapeutic uses, indications, techniques of application, principles of treatment and contraindications.

Capacitive energy transfer (Long Wave Diathermy)

Introduction and characteristics, physiological effects and therapeutic uses, technique of application and principles of treatment and dangers

Micro Wave Diathermy –

Introduction and characteristics, physiological effects and therapeutic uses, technique of application and principles of treatment and dangers

LASERS –

Introduction and characteristics, therapeutic effects, principles of application, indication, contraindication and dangers

Ultrasonic therapy –

Introduction and characteristics, US therapy parameters, coupling media, therapeutic effects indication, contraindication and dangers, testing of apparatus, technique of application and dosage.

Care of the Wound –

UVR, LASER, US

ELECTROTHERAPY – II

Objectives:

At the end of the course the candidate will be able to

1. Describe and identify various types of electrodes, use in therapeutics, resistance offered by the skin and significance of various media used to reduce the same.
2. Describe the production, physiological effects, therapeutic uses, merits, demerits, indications and contraindications of various low and medium frequency. Describe the panel diagrams of the machines.
3. Acquire the skill of application of low and medium frequency modes on the models for the purpose of treatment
4. Describe the physiological effect and therapeutic uses of various therapeutic ions to be used for the application of iontophoresis

Low Frequency Currents –

Nerve Muscle Physiology –

Resting potential, action potential, propagation of action potential, motor unit, synapse and synaptic transmission of impulses, effects of positive and negative electrodes on nerves and accommodation
Electric shock: Causes, severity, treatment and precaution, earth shock and its precautions

Farradic Current –

Definition, characteristic and modification faradic current, sinusoidal current, parameters of stimulation, physiological and therapeutic effects, indications and contraindications and precautions, techniques of stimulation, group muscle stimulation, faradic foot bath, Farradism under pressure and Pelvic floor muscle re education.

Interrupted Direct current –

Introduction and characteristics, parameters of stimulation, physiological and therapeutic uses of stimulation, precautions

Galvanic Current –

Introduction and characteristics, parameters of stimulation, physiological and therapeutic uses of stimulation, precautions.

Iontophoresis –

Definition, principles, physiological and therapeutic uses, indication, techniques of iontophoresis, and principles of treatment, contraindications and dangers

TENS –

Definition, theories of pain modulation, pain gate theory, principle and techniques of treatment, indication and contraindication

Medium frequency Current –

Interferential Current: Definition, characteristics, physiological and therapeutic effects, indications and contraindications, techniques of application, precautions

Russian Currents

Rebox currents

Advanced Electrotherapy –

Computerization in electrotherapy, programming of parameters of treatment, appropriate selection of parameters and combination in therapy, combined therapy-principles, therapeutic uses and indications like US with stimulation or TENS etc.

Introduction to Diadynamic currents, HVPGS and microcurrents

Electrical currents for the **Care of Wounds**

T.Y.B. PHYSIOTHERAPY

MEDICINE – I

Objectives:

At the end of the course the candidate will be able to

1. Describe the etiology, patho-physiology, signs and symptoms and management in brief about the general infectious conditions, diseases of metabolism, obesity and its other related medical conditions, diseases of blood deficiency, diseases of GIT and urinary tract, drug abuse-intoxication and psychiatric disorders
2. Describe the etiology, patho-physiology, signs and symptoms, clinical evaluation and management of the various cardiovascular and respiratory conditions with interpretation of chest X-ray, blood gas analysis, PFT findings, blood studies done for rheumatological conditions and EMG findings.
3. To acquire knowledge of autoimmune conditions with special emphasis to those involving musculoskeletal system and skin, etiology, path-physiology, signs and symptoms, differential diagnosis and medical management
4. Describe the principles of management at the medical ICU

General Medicine:

1. Endocrinal Disorders: endocrine diseases, special emphasis to be given to obesity and its related disorders-management, diet, exercise and medication, Diabetes Mellitus, Thyrotoxicosis, Myxoedema
2. GI Disorders: Peptic Ulcers, Dysentery, Pancreatitis, Diarrhea, Inflammatory Bowel Diseases, Jaundice, Cirrhosis of liver
3. Infectious Diseases: Tuberculosis, Malaria, Typhoid, Infective Hepatitis, Tetanus
4. Nutritious Diseases: Vitamins and its deficiencies, Disorders including Rickets and Osteomalacia, Anemia
5. Urogenital System: Structure and function of kidneys including physiology of micturition, Acute and chronic renal failure, Glomerular Nephritis, Pyelonephritis
6. Rheumatology: Rheumatoid Arthritis, Ankylosing Spondylitis, Gout, Osteoarthritis, Spondyloarthritis, SLE, Polyarteritis Nodosa, Mixed Connective Tissue Disorders, Scleroderma

Cardiothoracic Medicine:

1. Brief etiopathogenesis of Cardio respiratory system
2. Outline, etiopathogenesis of cardio respiratory disorders, investigations, diagnosis, differential diagnosis and principles of management.
Cardiovascular System:
 - a. Cardiac Failure-Definition, causes, signs and symptoms and brief management of cardiac failure
 - b. Rheumatic fever-Definition, brief description of etiology, clinical features, complications and treatment.
 - c. Congenital Heart Diseases-Classification, symptoms and complications
 - d. Ischemic Heart Disease – Etiopathogenesis, classification, symptoms, diagnosis including stress test, medical and surgical treatment
 - e. Hypertension-Definition Classification, symptoms and complications and treatment.

- f. Infective Endocarditis – brief description of etiology, clinical features, diagnosis and treatment.
- g. Brief description of DVT and Pulmonary Embolism
- h. Vascular Diseases – Atherosclerosis, Beurger's Disease, Raynaud's Disease, Phlebitis etc.
- i. Cardiac Muscle Disorders – Cardiomyopathies, Myocarditis
- j. Cardiac Tumors.

Respiratory System: (Respiratory disease including the diseases of the chest wall)

- a. Chronic Bronchitis and Emphysema – definition, clinical features, diagnosis and treatment
- b. Bronchial Asthma – definition, etiopathogenesis, clinical features, diagnosis and treatment
- c. Pneumonia – Definition, classification, clinical test of pulmonary tuberculosis, diagnosis, complication and treatment.
- d. Tuberculosis – Etiopathogenesis, classification, clinical test of pulmonary tuberculosis, diagnosis, complication and treatment
- e. Lung Abscess and Bronchiectasis – definition, clinical features, diagnosis and treatment
- f. Pleural Disorders – Pleural effusion, Empyema, Pneumothorax
- g. Chest wall deformities – Describe various deformities of the chest wall and effect and pulmonary diseases associated with it.
- h. Occupational Lung Diseases – Clinical features, diagnosis and treatment
- i. Respiratory Failure – Classification, causes and treatment
- j. Lung Function Test
- k. AIDS

Intensive and Emergency Care:

- a. Review of anatomy and physiology related to acute care, cardiovascular, nervous and musculoskeletal system
- b. Common emergencies (surgical and medical)
Trauma – accidents; explosions, gun shots, shock, hemorrhage, DIC, burns, septicemia, acute respiratory failure, pulmonary edema, pulmonary embolism, ARO cardiac failure, Myocardial infarction, cardiac arrhythmias, unconsciousness, coma, cerebral hypoxia, drug overdose, poisoning, tetanus, respiratory paralysis, polio, GBS, renal failure, obstetrical emergencies, pediatric emergencies.
- c. Intensive/ metabolic emergencies
- d. Anesthetics: Types, indications, merits, demerits, effects of general anesthesia on cardiopulmonary function
- e. Special procedures in ICU: Cardiopulmonary resuscitation, Airway care bronchoscopy, Thoracocentesis, tracheostomy, intubation, chest tubes (nasogastric tubes and tracheal intubation), Skeletal and skin traction
- f. Bioelectric Instrumentation, interpretation, ECG, Cardiopulmonary monitoring, Radiological evaluation, A&C analysis, fluid and electrolyte balance, hematological studies.
- g. Therapeutics, mechanical ventilators, medical gas therapy, IPPB.
- h. Psychological aspect of critical care

PAEDIATRICS

1. Growth and Development of a child from birth to 12 years, including physical, social, adaptive development
2. Maternal and neonatal factors contributing to high risk pregnancy, the neonate, inherited diseases, maternal infections – viral and bacterial, maternal diseases incidental to pregnancy, induced hypertension, chronic maternal diseases such as heart diseases, renal failure, TB, Diabetes, epilepsy, bleeding in the mother at any trimester.
3. Community program: international (WHO), national and local for prevention of poliomyelitis, deafness, blindness, mental retardation and hypothyroidism, the immunization schedule for children.
4. Cerebral Palsy: etiology – prenatal, perinatal and postnatal, pathogenesis, types of cerebral palsy (classification), findings on examination, general examination, examination of CNS, musculoskeletal system, respiratory system, GIT and nutritional status.
5. Associated defects: Mental retardation, microcephaly, blindness, hearing and speech impairment, squint and convulsions.
6. Prevention: appropriate management of high risk pregnancy, prevention of neonatal and postnatal infections, metabolic problems.
7. Muscular Dystrophy: Various forms, modes of inheritance and clinical manifestations, physical finding in relation to disabilities, progression of various forms and prognosis.
8. Spina Bifida, Meningomyelocele: Development, clinical features-lowerlimbs, bladder and bowel control, complications – UTI and hydrocephalus, medical and surgical treatment.
9. Still's Disease: Classification, pathology in brief, physical findings, course and prognosis, treatment, prevention and correction of deformity.
10. Acute CNS Infections: classification(bacterial and viral), the acute illness, CNS sequelae leading to Mental retardation blindness, hearing and speech impairment, motor paralysis, bladder and bowel problems, seizures and specific problems like subdural effusion, hydrocephalus, pressure sores, feeding difficulties.
11. Normal diet of new born and child: List dietary, calorie, fat, protein, mineral and vitamin requirement in an normal child and a child with malnutrition, etiology, finding and treatment of Rickets, Vit-D deficiency and resistant Rickets.
12. Lung Infections: clinical findings, complications and medical treatment of Bronchiectasis, Lung Abscess and Bronchial Asthma.

DERMATOLOGY:

1. Structure and function of normal skin, primary and secondary skin lesions
2. Scabies and Pediculosis
3. Fungal infections of skin:
 - Dermatophytosis
 - Pitriasis Versicolor
 - Candidiasis
4. Bacterial infections of skin: Impetigo/boil
5. Viral Infections of skin: Herpes Zoster
6. Eczema/ Dermatitis/ Allergies
7. Psoriasis/ Acne/ Alopecia/ Vitiligo and Leukoderma
8. Leprosy/ Lepra reactions
9. Skin Diseases related to Rheumatology and Tropical skin diseases
10. Sexually Transmitted Diseases:
 - Syphilis: Primary and Secondary
 - Gonorrhoea
 - Chancroid
 - AIDS

MEDICINE II

NEUROLOGY:

Objectives:

At the end of the course the candidate will be able to describe

1. The etiology, pathophysiology, signs and symptoms and management in brief about the neurological conditions with special emphasis on movement, pain and ADLs.
2. The etiology, pathophysiology, signs and symptoms, clinical evaluation and management of the various neurological conditions with interpretation of hematological investigations, chest X-ray, C.T. and MRI scans done for neurological conditions with NCV/EMG findings.

Syllabus:

1. Basis Neurophysiology:
 - Motor (pyramidal, extrapyramidal, system, spinal cord, upper and lower motor neurons, cranial nerves, brachial plexus, lumbosacral plexus and peripheral nerves.
 - Sensory
 - ANS: reflexes, bladder and bowel control
2. Principles of clinical examinations, diagnosis, differential diagnosis and management of common neurological disorders.
3. Salient clinical features and management of common neurological conditions
 - Cerebrovascular accidents: strokes (hemiplegia), unconscious patient
 - Diseases of Spinal cord:
Compressive-spondylotic, tumors
Noncompressive-paraplegia, quadriplegia
Foot drop and wrist drop
 - Cerebral Palsy with mental retardation, spastic child
 - Disorders of cerebral circulation
 - Neuroinfections: Meningitis, encephalitis, Poliomyelitis, Transversemyelitis, neurosyphilis, slow viral diseases
 - Peripheral Neuropathies: GBS, Diabetic Neuropathy, entrapment neuropathies
 - Muscle Disorders: Myopathy, Polymyositis, Muscular dystrophies, Myasthenia Gravis.
 - Movement Disorders – Parkinsonism, Chorea, Dystonia, Tremors and Writer's cramps; Cerebellar Ataxia, Friedreich's Ataxia
 - Motor Neuron Diseases, Spinocerebellar degenerations and diseases of AHC
 - Dementia
 - Costoclavicular Syndrome
 - Demyelinating disorders including Multiple Sclerosis
 - Basic concept of electrophysiology and electromyography

OBSTETRICS AND GYNAECOLOGY:

Objectives:

At the end of the course the candidate will be able to:

1. Describe the normal and abnormal physiological events during the puberty, labor, puerperium, post – natal stage and menopause.
2. 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 management in brief.
3. Acquire the skill of clinical examination of pelvic floor
4. Acquire the skill of clinical examination of pregnant woman.

Syllabus:

1. Anatomy and physiology of the female reproductive organs. Puberty dynamics
2. Physiology of menstrual cycle – ovulation cycle, uterine cycle, Cx cycle, duration, amount
3. Hormonal regulation of menstruation
4. Diagnosis of pregnancy
5. Abortion
6. Physiological changes during pregnancy
7. Importance of antenatal care exercise
8. High risk pregnancy, prenatal common complications – investigation and management
9. Musculoskeletal disorders during pregnancy
10. Multiple child birth
11. Normal labor
12. Child birth complications, investigation and management
13. Normal puerperium, lactation and importance of post natal exercises
14. Family planning.
15. Medical termination of pregnancy
16. Infection of female genital tract including sexually transmitted diseases, low backache
17. Prolapse of uterus and vagina
18. Principle of common gynaecological operations – hysterectomy, D&C, D&E, Pop smear
19. Menopause: Its effect on emotions and musculoskeletal system
20. Urogenital dysfunction – pre and post natal condition
21. Sterility: Pathophysiology, investigations, management
22. Carcinoma of female reproductive organs – surgical management in brief.

SURGERY – I

Objectives:

At the end of the course the candidate will be able to

1. Describe the effects of surgical trauma and anesthesia in general
2. Classify, clinically evaluate and describe the surgical management in brief in
Wounds – ulcers
Burns
3. Describe preoperative evaluation, surgical indications and various surgical approaches in various abdominal conditions
4. Recall the surgical approaches in the form of lined diagram and will be able to describe the components of soft tissues, cut to reach the target tissue and the possible post operative complication in movement.
5. Clinically evaluate post operative abdominal conditions, with special reference to cardiovascular and pulmonary function and scar-wound management. Describe post operative management in brief.
6. Describe the management of head injury, spinal surgeries, intracranial tumors, PNI and pain
7. To read and interpret investigations including findings of X-ray C.T., M.R.I.

GENERAL SURGERY:

Syllabus:

Acute infections: Inflammatory fever, bacteremia, septicemia, pyeremia, toxemia.

Specific types: Cellulitis-sites, lymphangitis, abcess with special reference to hand infection, carbuncle.

Specific Types Contd.: Tetanus, Gas gangrene, hospital infection, cross infection with modes of spread and prevention

General survey of chronic inflammation: syphilis (reference to other venereal diseases),* leprosy and actinomycosis

Surgical Tuberculosis

General survey of trauma, pathology, clinical features of wound repair-primary, secondary and tertiary wound repair

Clean and contaminated wounds and infectious wound, principles of treatment, survey of factors affecting wound healing, ulcers and gangrene, post operative complications of abdominal surgery, specifically chest, wound infection, edema.

Malignancy – spread and its behaviour

Various abdominal incisions, abdominal drainage tubes, catheters and nasogastric tubes

Ward demonstration for an hour a day for a period of one week

Anesthesia and O. T. demonstrations

UTI

Problems of trauma to the hand and their management

Breast surgery

Abdominal surgeries: appendisectomy, cholecystectomy, partial colostomy, ileostomy, hernia, prostratomy, nephrectomy

PLASTIC SURGERY:

- * Burns as a specific types of severe trauma, classification, early and late complications, management and reconstructive surgery – skin as an example of plastic procedure.
- * Types of skin grafting – take up of a graft – healing of a graft, post operative care of plastic surgery with specific role of physiotherapy.
- * Principles of cineplasty, tendon transplant, cosmetic surgery, types of graft, surgery of hands with emphasis on a management of traumatic and leprosy hand
- * Neck, skin contractures and management

NEURO SURGERY:

Neuro-Physiology:

Neurophysiologic phases of tone, disorders of tone and posture, bladder control, muscle contraction, movement and pain

Outline of surgical disorders of brain – head injuries

General survey of diseases of spine and spinal cord, Paraplegia

C/F and management of the following:

- Congenital and childhood disorders – hydrocephalus and spina bifida
- Trauma – broad localization, First aid and management of sequelae of hand, injury and spinal cord injury
- Diseases of the spinal cord-craniovertebral junction anomalies, syringomyelia, cervical and lumbar disc diseases, tumors
- Peripheral nerve disorders – peripheral nerve injuries, localization and management, entrapment neuropathies
- Intracranial tumors – broad classification, signs and symptoms
- Preoperative assessment and indications and contraindications for neuro surgery
- Management of pain, electrical stimulation of brain and spinal cord
- Miscellaneous

E.N.T.:

- Anatomy and physiology of hearing and the use of audiometry in assessment of hearing-outline only
- General introduction to diseases of E.N.T., emphasis on otitis media, Bell's palsy, sinusitis and rhinitis
- Mastoid surgery
- Larynx and associated function paralysis with tracheostomy and care of tracheostomy
- Causes of hearing loss, conservative and surgical intervention including types and availability of hearing aids

RADIOLOGY:

Introduction, X-rays, of fractures of bones, orthopedic conditions-O.A., P.A., Cervical and lumbar spondylosis, common chest conditions, C.T. scan, M.R.I. and angiography etc.

CARDIOTHORACIC SURGERY:

Objectives:

At the end of the course the candidate will be able to

1. Describe the types of incisions, pre and post operative assessment, management and complications of cardiothoracic surgery
2. Clinically evaluate post operative cardiovascular and pulmonary functional status
3. to read and interpret investigations including findings of X-ray, C.T., M.R.I.

Syllabus:

1. Basic anatomy of chest wall, trachea and bronchial tree, lungs and bronchopulmonary segments, pleura and mediastinum
2. Physiology and mechanics of breathing and use of mechanical breathing – ventilators (respirators)
3. P.F.T.
4. Investigation of lung diseases including endoscopies
5. Chest injury
6. Common suppurative diseases of the lung: Bronchiectasis and Lung abscess
7. Bronchogenic Carcinoma
8. Common surgeries of chest: thoracoplasty, pulmonary dissections, thoracotomy; Pneumothorax, hydropneumothorax and empyema
9. Common diseases of esophagus and related conditions causing dysphagia
10. Surgery of portal hypertension
11. Surgery of pulmonary T.B.
12. Surgery of heart and great vessels
13. Basic anatomy of heart and great vessels
14. Investigation of patients undergoing cardiac surgery
15. Cardiac arrest and its management
16. Basic principles of open heart surgery: Heart lung by-pass, (extracorporeal circulation)
17. Common diseases of heart requiring surgery both congenital and acquired including open heart surgery
18. Common drugs used in cardiac surgery its uses and side effects
19. Common vascular surgeries – Embolectomy, vascular deconstructive surgery, (thrombosis, embolism, atherosclerotic and occlusive vascular diseases) including coronary artery by-pass

Clinical

1. Examination of patients as regards chest and heart disease
2. Demonstration – acquaintances with C.T. surgery, equipments, I.C.C.U./O.T.
3. Radiology:- X-ray studies – in various lung diseases

OPHTHALMOLOGY:

Common eye disease including Refractory errors, conjunctivitis and trachoma

Cataract and Glaucoma

Squint and Ptosis

Eye Lesions in leprosy, including causes, treatment and complications of lagophthalmos

Causes, clinical features and treatment of disorders of ocular movement occurring in diseases such as myasthenia gravis, progressive supranuclear palsy and LMN Diseases

Causes, clinical features and treatment and prognosis of inflammatory diseases, vit-A deficiency, emphasis on preventable causes and prophylactic measures

Definition of blindness and visual disability evaluation

Investigative procedures used for testing visual failures

ORTHOPEDICS

Objectives:

At the end of the course the candidate will be able to

1. Discuss the pathophysiology, clinical manifestations and conservative/ surgical management of various traumatic and non-traumatic and old cases of musculoskeletal conditions
2. Gain the skill of clinical examination and interpretation of the preoperative old cases and all the postoperative cases
3. Read and interpret:
Salient features of the x-ray of the spine and extremities
Pathological / biochemical studies pertaining to orthopedic conditions
4. Correlate the radiological findings with clinical findings

General Orthopedics –

Clinical examination of an orthopedic patient, investigation, radiological and imaging techniques, salient features

Deformities, acquired deformities, causes and principles of management

Splinting

Traction procedures – materials

Preventive orthopedics

Geriatric orthopedics

TRAUMATOLOGY

Introduction, General principles and injuries of the upper limb; briefly mention orthopedic surgery, definition and scope, brief history

Sprains, fractures and dislocations: causes, types, mechanisms, displacements, general symptoms, healing, principles of treatment, complication, malunion, delayed union, nonunion, myositis ossificans, VIC, fat embolism, Sudeck's osteodystrophy.

Injuries to the hand: types (open, closed), principles of treatment, injuries to the phalanges, sprains, dislocations of MP and IP joints, fractures of the phalanges, MCPs Bennett's fracture, Mallet finger, tendon injuries(flexor and extensors)

Wrist and forearm injuries: wrist dislocation, Colles' fracture, displaced epiphysis, Smith fracture, Barton fracture, injuries to carpal, scaphoid and sprains; fracture of forearm bones-Greenstick fracture, infraction injury, both bone fracture, Galleazi, montagia fracture

Injuries to the elbow: traumatic synovitis, sprain, dislocation of the elbow

Fractures involving the elbow joint: supracondylar fracture, intercondylar fracture, fracture of medial epicondyle and lateral epicondyle, myositis ossificans, VIC, fracture of head of radius and olecranon

Injuries of shoulder and arm: Fracture of proximal end, neck, shaft of humerus, fractures of clavicle, acromioclavicular and sternoclavicular dislocations, fractures of scapula

Injuries of spine and pelvis:

Injuries to the cervical spine (upper and lower), atlantoaxial injuries,

Dorsolumbar spine: classification, mechanism and types of injuries, stable fracture without paraplegia, fracture dislocation with paraplegia; management of fracture and paraplegia, bedsore and bladder bowel

Pelvic injuries: fractures, its mechanism, classification and management; fractures of acetabulum, sacrum and coccyx.

Injuries of the lower limb:

Dislocations of hip joint, intracapsular and trochanteric fractures of femur, fractures of the neck of femur, shaft of femur and fracture femur in children.

Fracture of femoral and tibial condyles and patella, injuries to extensor mechanism, contusion, Hemarthrosis, knee joint dislocation and traumatic dislocation of patella

Fracture and fracture dislocation of ankle, epiphyseal injury, lower end of tibia

Foot: Fracture of talus, calcaneum, MTs and phalanges

Soft tissue injuries: ligamentous injuries of ankle and injury to muscles

Amputations: types, ideal stump, complications, general principles of treatment, Upper and lower extremity amputations – prosthesis

Orthopedic splints and appliances for injuries to muscles and tendons

Principles of operative management, indications and contraindications for arthroplasty, osteotomy, arthrodesis, spinal stabilization, tendon operations, arthroscopy, total and partial joint replacements, limb reattachments

NON-TRAUMATOLOGY

Congenital disorders –

Congenital deformities, congenital elevation of scapula, torticollis, cleidocranial dysostosis, superior radioulnar dysostosis, Madelung's deformity, SCM tumor, congenital wry neck, Kyphosis, lordosis, scoliosis – primary and secondary, spina bifida, meningomyelocele, coxa vara, CDH, congenital genu recurvatum, CTEV.

Infections of bone and joints –

Osteomyelitis: acute and chronic, Brodie's abscess (as a complication of open fracture), skeletal T.B., principles of treatment T.B. of shoulder, elbow and wrist, hip, knee, ankle and foot; T.B. Osteomyelitis: Dactylitis, Caries rib

Arthritis –

Acute pyogenic arthritis, septic arthritis of infancy, small pox arthritis, syphilitic infection of joint R.A., O.A.

Bone Tumors –

Classification, true bone tumors; osteosarcoma, giant cell tumor, Ewing's sarcoma, Chondroblastoma, chondrosarcoma, fibrosarcoma, lymphoma of bone, plasmacytoma.

Bone metastasis: synovial sarcoma, hemangioma of bone, adamantinoma of long bones and chondroma

Tumor like lesions: osteoma, benign osteoblastoma, nonosteogenic fibroma, osteochondroma, osteoid osteoma and enchondroma

Neurological and muscular disorders –

Poliomyelitis: recovering and late stages, rehabilitation and recovery phase, tenodesis, tendon transplants, stabilization problems, short limb and equalization and tendon lengthening

Cerebral Palsy: types, treatment including orthopedic surgeries

Leprosy: classification, multi drug therapy, foot drop, trophic ulcer, deformities in the hand – claw hand and rehabilitation

Muscular dystrophy: types and treatment

Injuries to plexuses and nerves: brachial and lumbosacral plexus, radial, ulnar, median, sciatic and lateral popliteal

Regional conditions of spine and lower limb –

Backache: kyphosis, scoliosis, spondylol isthesis, lumbosacral strain, PIVD, fibrositis back, lumbar canal stenosis, sacroiliac strain, spondylosis, spondylolysis

Hip: coxa vara, slipped upper femoral epiphysis, idiopathic chondrolysis of hip

Knee: Genu valgum & varum, recurvatum, tibia vara, quadriceps fibrosis, recurrent dislocation of patella, bursa around the knee, loose bodies in the knee, CMP

Foot: Painful heel, plantar fasciitis, posterior heel pain, flat foot, foot strain, pain in forefoot, hallux valgus, anterior metatarsalgia

Regional conditions of neck and upper limb –

Neck: C.S., PIVD, Cervical rib, torticollis, brachialgia

Shoulder: supraspinatus tendonitis, calcification, rupture of rotator cuff, adhesive capsulitis, deltoid fibrosis, Subacromioid bursitis, bicipital tendonitis

Elbow: tennis elbow, golfer's elbow, recurrent slipping of ulnar nerve, cubitus varus and valgus

Wrist and hand: ganglion, D.Q., trigger finger and thumb, carpal tunnel syndrome, Dupuytren's contracture

Miscellaneous –

Backache, disc lesions, metabolic diseases, rickets, Osteomalacia, osteoporosis, parathyroid osteodystrophy, scurvy etc. tenosynovitis

PHYSICAL AND FUNCTIONAL DIAGNOSIS

Objectives:

This course is aimed at physical diagnosis based on I.C.I.D.H.-II definition.

At the end of the course, the candidate will-

1. Acquire the skill of detection & objective documentation of the Neuro- musculo-skeletal dysfunction such as Pain, Altered muscle power, Mobility, Endurance, Limb length, Posture, Gait, Hand function & A.D.L.; as well as Exercise tolerance [with special emphasis to Cardio-respiratory function] & will arrive at the Physical [Functional] diagnosis in terms of Impairment, activity [Disability] Participation [Handicaps] with the appropriate clinical reasoning.
2. Be able to analyze & discuss the Physiological & Biomechanical bases of movement dysfunction & apply the same for functional diagnosis.
3. Acquire the skills to use on patients, the therapeutic currents, for Electro-diagnosis of sensory, motor, accommodation dysfunction & pain.
4. Be able to describe the Physiology of nerve impulse, Motor unit, its electro-physiological character, Bases for detection of abnormal EMG, Late responses, Reflexes and Nerve conduction.

Syllabus:

1. Electro-diagnosis: Bioelectricity - Physiology of generation & propagation of action potential – Volume conduction:
 - a) Therapeutic current – as tool for electro-diagnosis – physiological principles – use of alternating & direct current in electro-diagnosis such as SD curves, use of Biofeedback unit for assessment of muscle function.
 - b) Principles of Electromyography – Motor unit – Normal characteristics – Activity at rest, Recruitment/frequency pattern at minimal activity, Interference pattern – Abnormal E.M.G. pattern.
 - c) Principles of nerve conduction.
 - d) Late responses: F-wave, H-reflex.
 - e) Electro-physiological principles of assessment of Myoneural junction.
 - f) E.M.G. instrumentation: Basic components, Panel diagram, Types of electrodes.
 - g) Biofeedback: Introduction, Principles of biofeedback, Therapeutic effects, Indications, Contraindications and Techniques of treatment.
2. Assessment of orthopaedic movement dysfunction:
 - a) General orthopaedic examination, Muscle strength, Power, Endurance, Flexibility, Limb-length discrepancy, Limb girth, Pelvic inclination, Goniometry, Trick movements, End-feel, Special Tests, Altered Posture & Gait –Functional analysis as per I.C.I.D.H-II norms.
 - b) Physical examination of joints in normal and patho – mechanical conditions
 - c) Assessment of pelvic floor muscle strength and function
 - i. Digital evaluation of vagina
 - ii. Perineometer
 - iii. Pad test
 - d) Disability Evaluation – gait and gait parameters, percentage of disability (temporary and permanent)

3. Assessment of neuro-muscular dysfunction:
 - a) General neurological examination, Higher functions, Cranial nerves, Altered muscle strength, Power, Balance, Endurance, Tone, Spasticity, Inco-ordination, Abnormal deep & superficial reflexes, Myotomes, Dermatomes, Voluntary control testing, Abnormal movements, Neural control of bladder, Nerve entrapments, Gait and Functional evaluation as per ICIDH-II norms.
 - b) Posture and alignment: Biomechanical and neural factors.
4. Assessment of cardio-pulmonary dysfunction:
 - a) Chest expansion, Abnormal breath sounds, Quality of life questionnaires, Borg scale, Principles of exercise tolerance test – Assessment of vital parameters in simple functional test, 6 minutes walk test, 12 minute walk test, Shuttle walk test, Canadian step test, Treadmill test, Symptom limited test, Breath holding test, Spirometry, Peak-flowmetry, Theoretical bases of Bruce's protocol, Astrand Protocol & Step test.
5. Functional diagnosis:
 - a) ICIDH-II, FIM, STREAM, BBS, Barthel Index and HRQoL – SF36.
6. Interpretation of various investigations:
 - a) Radiological (X-rays, CT scan, MRI).
 - b) Routine Biochemical investigations (ABG, blood, CSF, etc).
 - c) Electro-diagnostic (EMG, NCV, SDC etc) findings.
 - d) PFT analysis.
7. Assessment of pain:
 - a) Intensity, Quality, Objective assessment, Documentation.
8. Assessment of Hand:
 - a) Pinches, Grips, Routine sensory motor evaluation, Stereognosis.
9. Sports:
 - a) Systemic and Physiological effects.

Clinical:

1. Electro-diagnostic assessment using short/long pulse direct currents, Alternating currents and Biofeedback for,
 - a) Motor function: Galvanic/Faradic type test, S.D. curves.
2. Identification of abnormal breath sounds, Chest expansion, Pattern of breathing, Respiratory rate, Grades of Dyspnoea, Rate of Perceived exertion.
3. Exercise tolerance & Fitness testing: 6 minutes walk test, Symptom limited test.

Text Books:

1. Maitland's book on Manual therapy.
2. Clinical Electrotherapy - Nelson-Currier - Appleton & Lange publication.
3. Clinical Electromyography - by Mishra.
4. Mobilisation – Kaltenborn.

Reference Books:

1. Orthopaedic Physical examination - by Magee.
2. Mobilization methods – Kaltenborn.
3. Clinical Electromyography – Kimura.
4. Orthopaedic Physical therapy – Donnatelli.
5. Exercise & Heart – Wenger.
6. Exercise Physiology - Mc Ardle.
7. Physical Rehabilitation – Susan O’Sullivan.

FINAL YEAR B.PHYSIOTHERAPY

NURSING AND FIRST AID

(Not for University Exam)

Objectives:

At the end of the class the candidate will be able to:

1. Know the basic role and importance of nursing in patients
2. Know basic handling of patient in positioning, lifting and transporting from wheelchair and stretchers, feeding and self hygiene
3. Do simple dressings and first aid in emergencies

Introductory class:

What is nursing, nursing principles, interpersonal relationships, bandaging: basic turns, bandaging extremities, triangular bandages and their applications.

Nursing Position:

Environment safety, bed making, prone, lateral, dorsal, dorsal recumbent, Fowler's position comfort measures, aids and rest and sleep

Trauma Management:

Immediate Treatment, transferring patient from accident site to trauma centre

Lifting and transporting patients:

Lifting the patients up in the bed. Transferring from bed to wheel chair, from bed to stretcher

Bed side management:

Giving and taking bed pan, urinal, observation of stools, urine, sputum, understand use and care of catheters, enema giving.

Method of giving nourishment:

Feeding, tube feeding, drips and transfusion

Care of Rubber goods:

Observation, reporting and recording temperature, respiration and pulse, simple aseptic technique, sterilization and disinfection

Surgical dressing:

Observation of dressing procedures

First Aid:

Syllabus for certificate of Red Cross society of St. John's Ambulance Brigade

C.P.R.

Management of shock

FINAL YEAR B. PHYSIOTHERAPY

PHYSIOTHERAPY IN ORTHOPEDIC CONDITIONS

Objectives:

At the end of the course the candidate will be able to:

1. Identify, discuss and analyze the musculoskeletal dysfunction in terms of biomechanical and biophysical basis and correlate the same with the provisional diagnosis, routine radiological and electrophysiological investigations and arrive at appropriate functional diagnosis with clinical reasoning
2. Describe as well as acquire the skill of executing short and long term treatment by selecting appropriate mode of mobilization/ manipulation, electrotherapy, therapeutic exercise and appropriate ergonomic advice for the relief of pain, restoration or maintenance of function &/rehabilitation for maximum functional independence for ADL at home and workplace
Musculoskeletal Evaluation Which includes.
10 Basic Laboratory Data/ Blood tests Interpretation.
 1. EMG, NCV Interpretation.
 2. MRI/ CT scan Screening & Interpretation.
 3. Physical Examination Including Manual Muscle Testing
 4. Special Tests for motor function, Sensory function & Autonomic.
 5. Superficial & Deep Reflexes / Jerks.
 6. Analysis of Current Impairments & Effect to function.
 7. Analysis of Prolonged Impairment functional limitation & Disability.
 8. Analysis of Living Environment, Potential Discharge Description & Social Supports.

Syllabus:

TRAUMATOLOGY:

- 1) **General Physiotherapy approach in traumatology:** fractures and complications- definition, healing, causes, signs and symptoms, methods of reduction, means of immobilization, duration, fractures in children-epiphyseal injury, principles of physiotherapy assessment and management in fractures of injury, principles of physiotherapy assessment and management in fractures of UL and LL bones, scapula, ribs, vertebrae and pelvis and fracture complications
- 2) **General physiotherapy approach in dislocations:** causes, types principles of treatment, Physiotherapeutic assessment and management (conservative and surgical) or shoulder, elbow, wrist, MP, IP, hip knee ankle dislocations, acromioclavicular and sternoclavicular joints.
- 3) **Physiotherapeutic assessment and management of soft tissue injury** – contusions, sprains, strains, ruptures of muscles and ligaments, meniscal injuries, arthroscopy.
- 4) **Rehabilitation of patient with orthopedic surgery:** pre and post op management of arthroplasty of all major joints, girdle stone arthroplasty, arthrodesis, arthroscopy, osteotomy, excision arthroplasty, total/partial hip and knee replacement, McMurry's osteotomy, reconstructive surgical mechanical changes (tendon transfer, Peripheral Nerve Injuries)
- 5) **Physiotherapeutic assessment and management of amputations:** Classification and levels of UL and LL amputations Physiotherapeutic and prosthetic management/ complete rehabilitation
- 6) **PT assessment and management of reconstructive surgery in CP and polio patients**

RHEUMATOLOGY AND INFECTIONS:

- 1) Pathological changes in inflammation, edema
- 2) Pyogenic conditions and Osteomyelitis
- 3) Physiotherapeutic assessment and management of rheumatology: still's disease, AS, bursitis, capsulitis, synovitis, tendonitis, infective arthritis, Gout, PA
- 4) PT assessment and management of infective conditions: TB spine and other major joints, Perthes disease, osteomyelitis, pyogenic arthritis
- 5) PT assessment and management in metabolic and hormonal disorders of the bone tissue-osteoporosis

DEGENERATIVE CONDITIONS:

- 1) Osteoarthritis: All joints
- 2) Lumbar and Cervical Spondylosis
- 3) Spondylolysis and Spondylolisthesis
- 4) Prolapsed Intervertebral Discs

CONGENITAL CONDITIONS:

Pt assessment and management in congenital and acquired conditions: coxa vara, valga, CDH, genu vara, valga, sprangle shoulder, torticollis, Madelung's deformity, wry neck, kyphosis, lordosis, CV anomalies, CTEV, pes cavus/planus

MISCELLANEOUS:

PT assessment and management of miscellaneous orthopedic conditions: Mallet and trigger finger, DQ, metatarsalgia, hallux, valgus, Dupuytren's contracture, fascitis, tennis elbow, ganglion, tenosynovitis, CMP, Osgood Schlatter's disease and causalgia Etc.

Sports medicine / rehabilitation

Objective:

At the end of the course, the candidate will be able to understand the nature of sports injuries and treat sports injuries, understand the role of therapist in training and rehabilitating a sports person.

Syllabus:

1. Sports injuries and management

PHYSIOTHERAPY IN NEUROMUSCULAR CONDITIONS

Objectives:

At the end of the course the candidate will be able to:

1. Acquire the knowledge of normal neuro development with specific reference to locomotion
2. Identify and analyze neuromotor and psychosomatic dysfunction in terms of alteration in the muscle tone, Power, coordination, involuntary movements, sensations/ perception etc. Correlate the findings with provisional diagnosis and investigations such as EMG/NCV studies and arrive at functional diagnosis with clinical reasoning in various neurological disorders.
3. Plan, prescribe and execute short term and long term treatment with special reference to relief of neuropathic and psychosomatic pain and use of various P.T. techniques/modalities including ergonomic advice and parent education in neuropediatric cases.
4. Prescribe appropriate orthosis/splints will be able to fabricate temporary protective and functional splints

Syllabus:

* Neuromuscular Evaluation Which Includes:

1. Basic Laboratory Data / Blood tests Interpretation.
2. ENG, NCV Interpretation.
3. MRI / CT Scan Screening & Interpretation.
4. Physical Examination Including Manual Muscle Testing.
5. Special Tests for motor function, Sensory function & Autonomic.
6. Superficial & Deep Reflexes/ Jerks.
7. Tests for Balance, Co-ordination & Its Interpretation.
8. Analysis of Current Impairments & Effect to function.
9. Analysis of Prolonged Impairment functional limitation & Disability.
10. Analysis of Living Environment, Potential Discharge Description & Social Supports.

1. Review of basis neuroanatomy and physiology
2. Symptomatology of neurological disorders, role of investigation in differential diagnosis
3. Clinical examination of CNS functions including cranial nerves.
4. Development disorders of CNS, early detection of brain damaged child, high risk babies, neuropediatrics examination.
5. Development programs and delayed milestones, Neurodevelopmental screening test, minimum brain damage, sensory motor, functional, psycho social behaviors of a child, perception development and training.
6. Neurodevelopmental approaches (Bobath technique, Rood's approach, Vojita technique, and biofeedback), limited patterns and abnormal motor behaviour due to brain damage, its control and training with reference to gait and hand function.
7. Assessment and treatment techniques in BRAIN DISORDERS:
 - Stoke
 - Cerebral palsy
 - Hydrocephalus
 - Meningitis
 - Encephalitis
 - Parkinsonism syndrome and parkinson's disease
 - Basal ganglia-extrapyramidal tract lesions
 - Head injury
 - Brain injury
 - Brain tumors

- Cerebellar ataxia
 - Friedreich's ataxia
 - Brain tumors
 - Head injury
8. Assessment and treatment of SPINAL CORD LESIONS:
- Motor Neuron Diseases (ALS, SMA, and other types)
 - Quadraplegia
 - Paraplegia
 - Monoplegia
 - Cauda Equina
 - Pott's Spine
 - Brown Sequard Syndrome
 - S.C.D.C.
 - Multiple sclerosis
 - Tabes dorsalis
 - Disseminated sclerosis
 - Transverse myelitis
 - Syringomyelia
 - Poliomyelitis
 - Spina bifida
 - Prolapsed disc
9. Assessment and treatment of PERIPHERAL NERVE LESIONS:
- Erb's palsy
 - Klumpke's palsy
 - Axillary nerve palsy (BPI)
 - Rectal palsy
 - Carpal tunnel syndrome
 - Thoracic inlet syndrome
 - Bell's palsy
 - Peripheral neuritis
 - Polyneuropathies
 - Causalgia
 - Sciatic nerve injury
 - Nerve trunk and root injuries
 - Cranial nerve injuries (intra-cranial aneurysms and abscess, tumors)
 - Leprosy-operations, transplantations, graphs, sutures and splints
10. Pre and post surgical assessment and treatment in Neuro surgeries including
- Hydrocephalus
 - Myelomeningocele
 - C.V. junction anomalies
 - Spinal neoplasms, Infections, T.B., abscess
 - Laminectomy
 - Discoidectomy
 - Spinal fusion
11. Electrodiagnosis SDC , FG Test Chronaxie , Rheobase,EMG,NCV
12. Miscellaneous : Myopathies, Myaesthesia Gravis, Herpes Zoster

PHYSIOTHERAPY IN GENERAL MEDICAL AND SURGICAL CONDITIONS

Objectives:

At the end of the course the candidate will be able to:

1. Identify discuss and analyze cardiovascular and pulmonary dysfunctions based on pathophysiological principles and arrive at appropriate functional diagnosis.
2. Acquire knowledge of rationals 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
7. Acquire the knowledge of various conditions where physiotherapy plays a vital role in the rehabilitation (psychiatry, dermatology, geriatric and ENT conditions)
8. Evaluate, grade and treat non healing wounds.

Syllabus:

1. Physiotherapy in mother and child care – ante and post natal management, early intervention and stimulation therapy in child care (movement therapy)
2. Geriatrics – handling of old patients and their problems.
3. Psychiatry – Physiotherapy in psychiatric conditions.
4. Complication common to all operations
5. Abdominal incisions.
6. Physiotherapy in pre and post operative stages.
7. Operations on upper G.I.T.- oesophagus, stomach, duodenum
8. Operations on large and small intestine – Appendicectomy, cholecystectomy, partial colectomy, ileostomy, hernia and herniotomy, hernioraphy, hernioplasty.
9. Gynecological operations – hysterectomy, prostatectomy, pelvic repair, caesarian section, nephrectomy and other operations.
10. Mastectomy – Simple, radical.
11. Burns and its treatment – physiotherapy in burns, skin grafts, and reconstructive surgeries.
12. Wounds, local infections, ulcers, pressure sores – UVR, and other electrotherapeutic modalities for healing of wound, hypergranulated scars, relief of pain and mobilization.
13. Skin conditions – Acne, psoriasis, alopecia, leucoderma, carbuncles and boils, STD's: AIDS, syphilis, gonorrhoea.
14. ENT – sinusitis, non suppurative and chronic suppurative otitis media, osteosclerosis, labyrinthitis, mastoidectomy, chronic rhinitis, laryngectomy, pharyngo – laryngectomy, facial palsy.

PHYSIOTHERAPY IN CARDIOPULMONARY CONDITIONS

Objectives:

At the end of the course the candidate will be able to:

1. Identify, discuss and analyze cardiovascular and pulmonary dysfunction based on path physiological principles and arrive at the appropriate functional diagnosis.
2. Acquire the knowledge of rationale of basis investigative approaches in the medical system and surgical intervention, regimes related to cardiovascular and pulmonary impairments.
3. Execute effective physiotherapeutic measures (with clinical reasoning) and special emphasis on breathing retraining, nebulization, humidification, bronchial hygiene, general mobilization and exercise conditioning.
4. Acquire knowledge of overview of patient's care at the I.C.U., artificial ventilation, suctioning, positioning for bronchial hygiene and continuous monitoring of patient in I.C.U.
5. Acquire the skill of evaluation and interpretation of functional capacity, using simple exercise tolerance test such as 6 minute walk test, symptom limited test.
6. Select strategies for cure, and prevention, afoft restorative and rehabilitative measures for maximum possible functional independence of patient at home, work and in community.
7. Acquire the skill of basic CPR.

Syllabus:

*Cardiopulmonary Evaluation Which Includes:

1. Pulmonary Function text & Its Interpretation.
2. Chest Imaging & Neck Imaging.
3. ECG Interpretation
4. Invasive & non-Invasive blood gas analysis & its Interpretation.
5. Basic laboratory data Interpretation.
6. Special Tests – Stress test, Exercise Tolerance Test
7. Interpretation of the procedures performed – Open heart Surgery, Angiogram, Nuclear Test Catheterization.
8. Analysis of current impairments & effect to function.
9. Analysis of prolonged impairments, functional limitation & disability.
10. Analysis of living environment potential discharge description & social supports.

1. Review of:
 - Mechanism of normal respiration
 - Cardiorespiratory anatomy and physiology
 - Relaxation and maintenance of bronchial hygiene in respiratory diseases
2. Respiratory and cardiac rehabilitation, fitness programs for cardiorespiratory Disorders – definition, aims and objectives, pathophysiology of diseases, Physiotherapy assessment and principles of rehabilitation
3. Principles and techniques of physiotherapy in diseases of respiratory and cardiopulmonary system – P.D., breathing exercises, PNF techniques of respiration
4. Clinical examination of cardiovascular disorders, principles and techniques of P.T. in cardiovascular diseases:
 - CCF
 - Myocardial infarction
 - Endocarditis, myocarditis, pericarditis
 - Valvular diseases of heart
 - Congenital heart diseases

5. Clinical examination of respiratory diseases, principles and techniques of P.T. in:
 - Chronic bronchitis
 - Emphysema
 - Asthma
 - Cystic fibrosis
 - Bronchiectasis
 - Pulmonary embolism
 - Pulmonary T.B.
 - Pleurisy
 - Empyema
 - Atelectasis
 - Pneumothorax and Bronchopulmonary fistula
6. Evaluation, principles and techniques of physiotherapy management in traumatic and surgical conditions of chest, lung, pleura and mediastinum
7. Cardiothoracic surgery – incisions, types, indications and contra indications
8. Pre and post operative physiotherapy assessment and management in:
 - Lobectomy, pneumonectomy, decortication, thoracoplasty
 - Tracheostomy
 - Mitral valvotomy (mitral stenosis)
 - Aortic incompetence
 - Valve replacement
 - PDA, coarctation of aorta
 - Pericardiectomy in chronic constrictive pericarditis
 - Septal defects, fallot's tetralogy
 - Bypass surgery
 - Open heart surgery and heart transplant
9. Physiotherapy assessment and management of vascular diseases:
 - Thrombosis, phlebitis and phlebotrombosis
 - Burger's disease
 - Varicose veins
 - DVT
 - Venous ulcers
 - Lymphoedema
10. Principles of chest physiotherapy in I.C.U., I.C.C.U. along with effect of anesthesia on cardiopulmonary system. Knowledge of equipments in CPU, I.C.U. and I.C.C.U.

REHABILITATION AND ALLIED THERAPEUTICS

Objectives:

At the end of the course the candidate will be able to

1. Understand the role of physiotherapist in multidisciplinary team approach in rehab
2. Understanding the principle of biomechanics and therapeutic application in neurological musculoskeletal dysfunction
3. Design, manufacture and use of bioengineering applications.
4. Describe the general concepts about health and disease: General fitness
5. Describe various national and international health policies – role of IAP to promote physiotherapy as a health delivery system
6. Attain ability of conducting small surveys and collection of anthropometry data, data collection for morbidity assessment.
7. Assess prevalence and incidence of various conditions that increase the morbidity, role of PT in improving morbidity, expected functional & clinical recovery. Reasons for non compliance in specific community, environment, solution strategy of CBR program, concept of team work, role of members in CBR, role of multipurpose health worker.
8. Comprehend the use of various allied therapeutic sciences in health care delivery.

Syllabus:

1. The philosophy and need of rehabilitation.
The principles of physical medicine
Basic principles of administration and organization
 2. The evaluation process and treatment planning
 3. Principles of prescription writing.
 4. Principles of rehabilitation
Nursing
Communication problem
Social problem
Vocational problems and placements
Occupational therapeutics
Speech pathology and audiology
 5. Ethics, Administration, Management, Marketing and Medico-Legal aspects
-
1. Introduction to Community Based Rehabilitation, Institute Based Rehabilitation, Outreach Based Rehabilitation, Community Approach to Handicapped Development.
 2. Definition of impairments, disability, rehabilitation
 3. Disability surveys – epidemiological aspects, screening for disabilities and developmental disorders, disability evaluation
 4. Disability presentation and rehabilitation
 5. Present rehabilitation services.
 6. Home exercise program in various PT conditions and parental education program
 7. Pediatric disorders – screening including mental retardation
 8. Vocational evaluation and goals for the disabled.
 9. Contribution of social worker to the rehabilitation.
 10. Rural rehabilitation incorporated with primary health centers.
 11. Extension services and mobile units.
 12. Community awareness and participation in preventing aspects and demands PT services.
 13. National district level rehab program

14. Disaster Management:-

- a) Definition: Disaster preparedness, Disaster response and disaster recovery
- b) Types of classification of Disasters
- c) Stages of progress of Disasters
- d) Role of physiotherapist in Disaster preparedness, response and disaster recovery.
- e) National and international agencies providing support during disaster
- f) Physiotherapist's role post disaster
- g) Physiotherapist's role of psychological upliftment post disaster.

15. Occupational hazards and health promotion.

Bio – Engineering

1. Introduction and terminology: prosthesis and orthosis
2. Classification of and difference between prosthesis and orthosis
3. Bio medical principles
4. Designing
5. Materials used for fabrications
6. Psychological aspects
7. Prescription and designing
8. Wheel chairs
9. Design and construction of adaptive devices

Prostheses:

- Purpose, types and biomedical principles
- Upper limb prosthesis
- Lower limb prosthesis in detail: B/K and A/k prosthetic components, check out procedures, gait analysis and deviations
- Syme's and partial foot prosthesis
- U.L. prosthetic devices: components, terminal devices, hooks, wrist units
- Forearm shoulder harness, suspension control system
- Prosthetic check out procedure

Orthoses:

- Purpose, types and biomedical principles
- Lower limb orthosis in detail: introduction to HKAFO Orthosis
- Pathological gaits, biomechanics of lower limb orthotics, components, check out procedure and training with orthosis
- U.L. orthosis: introduction to writ hand orthosis
- Principles of wrist finger thumb orthosis, opponens splint (short and long), finger splints for correction of contractures, knuckle bender splint, I.P. extension splint with lumbrical bar spring, coil assists
- Introductory demonstration of methods of construction of temporary orthosis for hand and fingers
- Spinal orthosis: introduction of lumbosacral (knight), thoracolumbar (Taylor) orthosis
- Cervical collar, Milwaukee orthosis

ETHICS AND ADMINISTRATION

(50 HOURS)

(ETHICS, ADMINISTRATION, MANAGEMENT & MARKETING)

SECTION – I: ETHICS

(20 HOURS)

Objectives:

This course is aimed to enable the candidate to acquire the knowledge of ethical code of professional practice, its moral & legal aspects, role of IAP, WHO & WCPT.

Contents:

1. Concepts of Morality, Ethics and Legality. Rules of professional conduct and their medico-legal & moral implications. The need of Council Act for Physiotherapy.
2. Constitution and Functions of the Indian Association of Physiotherapists.
3. Functioning of the World Confederation of Physical therapy (WCPT) & its various branches.
4. Role of WHO & WCPT

SECTION – II: ADMINISTRATION/MANAGEMENT & MARKETING

(30 HOURS)

Objectives:

At the end of the course the student will acquire the knowledge of the basics in Managerial & Management skills and use of Information Technology in professional practice.

Contents:

1. Management studies related to: -local health care organization management & structure, - planning delivery with quality assurance and funding of service delivery.
2. Information Technology in professional practice.
3. Time Management and Career Development in Physiotherapy.
4. Administration: Principles based on the Goals & Functions – at large hospital setup, domiciliary services, private clinic and academic setup.
5. Facility Planning – Academic and Clinical Setup.
6. Methods of maintaining records and documentation.
7. Budget planning for physiotherapy services in various setups.
8. Performance analysis: physical structure, reporting system (man power, status, functions), quantity & quality of services, turn over, cost benefit and revenue contribution.
9. Public Relations and Marketing: reaching media, marketing of physiotherapy practice and strengthening of brand identity with consumers & other health care professionals.

ALLIED THERAPEUTICS (Basics only)

1. Accupuncture and accupressure: definition, principles, techniques, physiological and therapeutic effects, contraindications and dangers
2. Introduction to Naturopathy
3. Magneto therapy
4. Yogasana and their scientific study (Suryanamaskar and Shavasan)

FIRST YEAR

ANATOMY

TEXT BOOKS

1. Human Anatomy – by Snell
2. Anatomy by Chaurasia all 3 volumes
3. Neuro anatomy by Inderbir Singh
4. Human Anatomy by Kadasne (All three volumes)

REFERENCE BOOKS

1. Gray's Anatomy
2. Externities by Quining Wasb
3. Atlas of Histology by Mariano De Fiore
4. Anatomy & Physiology by Smout and Mcdowell
5. Kinesiology by Katherine Walls
6. Neuroanatomy by Snell
7. Neuroanatomy by Vishram Singh

PHYSIOLOGY

TEXT BOOKS

1. Course in Medical Physiology – Vol – I & II by Dr.Chaudhary
2. Medical Physiology – by Dr Bijlani
3. Text book on Medical Physiology – by Gayton

REFERENCE BOOKS

1. Review of Medical Physiology – Ganong
2. Samson & wright's applied physiology
3. Human Physiology – Chaudhary & Bijlani
4. Semiclingum – Exxeritials of Medical Physiology – K Semubulingam

EXERCISE THERAPY

TEXT BOOKS

1. Principals of Exercise Therapy – Dena Gardiner
2. Massage, Manipulation & Traction – Sydney Litch
3. Therapeutic Exercises Do
4. Massage – Hollis
5. Suspension Therapy in Rehabilitation – Margaret Hollis

6. Bio Mechanics – Cynthia Norkins
7. Hydrotherapy – Duffield
8. Measurement of physical function – Cynthia Norkins

REFERENCE BOOKS

1. Therapeutic Exercises – Carolyn Kisner
2. Physiotherapy in Orthopedic conditions – by Jayant Joshi
(For the study of Basic Yogic postures)

SECOND YEAR

PATHOLOGY

TEXT BOOKS

1. Text book of Pathology – by Harsh Mohan
2. Pathologic basis of disease by Cotran, Kumar, Robbins
3. General Pathology – by Bhende

MICROBIOLOGY

TEXT BOOKS

1. Textbook of Microbiology – by R.Ananthnarayan & C.K. Jayram Panikar

KINESIO THERAPY

TEXT BOOKS

1. Progressive Resisted Exercises-Margaret Hollis
2. Therapeutic Exercise-Carol Kisner
3. Kinesiology-Cynthia Norkins
4. PNF-Knott and Voss

REFERENCE BOOKS

1. Therapeutic Exercise- Basmajian and Wolf
2. Muscle Testing- Daniel Kendall
3. Clinical Evaluation-Lacote
4. Muscle stretching and auto stretching- Olaf Evjenth
5. Orthopaedic Evaluation-Magee

ELECTROTHERAPY

TEXTBOOKS

1. Clayton's Electrotherapy
2. Electrotherapy Explained-Low and Reed
3. Electrotherapy-Kahn
4. Therapeutic Electricity-Sydney Litch

REFERENCE BOOKS

1. Clinical Electrotherapy- Nelson and Currier

PSYCHIATRY

TEXT BOOKS

1. A short book of Psychiatry- Ahuja
2. Handbook of Psychiatry-Shah L.P.

RESEARCH AND BIOSTATISTICS

TEXT BOOKS

1. Methods in statistics –B.K.Mahajan

THIRD YEAR

SURGERY

TEXT BOOKS

1. Undergraduate surgery –Nan
2. Short practice of surgery-Bailey and Love

ORTHOPAEDICS

TEXT BOOKS

1. Adam's outline of fractures – 8th edn
2. Adams outline of Orthopaedics – 8th edn
3. Apley's textbook of Orthopaedics

MEDICINE

TEXT BOOKS

1. API Textbook of Medicine
2. Golwalla –Medicine for students
3. Principles and practice of Medicine-Davidson

GYNAECOLOGY AND OBSTRETICS

1. Text book of Gynecology – by Dutta – New Central Book Agency

PAEDIATRICS

TEXT BOOKS

1. Essentials of Paediatrics – by O.P. Ghai – Inter Print publications
2. D.K. series in Paediatrics

PHYSICAL AND FUNCTIONAL DIAGNOSIS

TEXT BOOKS

1. Maitlands book on Manual therapy,
2. Clinical Electro Therapy –Nelson–Currier -Appleton & Lange publication
3. Clinical Electromyography – by Mishra
4. Mobilisation – Kaltenborn
5. Physical Rehabilitation, Assessment & treatment by Susan O's Sullivan

REFERCE BOOKS

1. Orthopaedic Physical examination – by Magee
2. Mobilization methods – Kaltonborn
3. Clinical Electromyography – Kimura
4. Orthopaedic Physical therapy – Donnatelli
5. Exercise & Heart – Wenger
6. Exercise Physiology – William D Mc'Ardle
7. Facilitation techniques based on NDT principles by Lois Bly Allison Whiteside
8. Neurological Examination by John Patten
9. Movement therapy in Hemiplegia by Brunnstrom
10. Cash textbook of Physiotherapy in neurological conditions by Patricia Downie
11. Physical Dysfunction by Tromble Scoot

FINAL YEAR

PHYSIOTHERAPY IN MUSCULOSKELETAL CONDITIONS

TEXT BOOKS

- 1) Cash's Textbook of Orthopedics & Rheumatology for Physiotherapists-Jaypee
- 2) Manual mobilization of extremity joints – by Freddy Kaltenborn, Maitland
- 3) Therapeutic exercise – by Kolby & Kisner
- 4) Therapeutic exercise – by O' Sullivan
- 5) Taping Techniques – by Rose Mac Donald

REFERCE BOOKS

- 1) Orthopedic Physical therapy – by Donatelli
- 2) Manual Therapy – by Maitland
- 3) Neural tissue mobilization – Butler

PHYSIOTHERAPY NEUROLOGICAL CONDITIONS

TEXT BOOKS

- 1) Cash's Textbook for physiotherapist in Neurological disorders-Jaypee bros.
- 2) Proprioceptive Neuro muscular Faciliation – by Herman Kabat
- 3) Practical Physical Therapy – Margaret Hollis
- 4) Therapeutic exercise – by O'Sullivan
- 5) "Right in the middle" – by Patricia Davis
- 6) Stroke rehabilitation – by Margaret Johnson

REFERCE BOOKS

- 1) Therapeutic exercise – by Basmajian – 5th edn.
- 2) Physical Rehabilitation – by Krusen
- 3) Brain's disorders of Nervous system

PHYSIOTHERAPY IN CARDIOVASCULAR AND RESPIRATORY CONDITIONS

TEXT BOOKS

- 1) Cash's Textbook for Physiotherapists in Chest, Heart & Vascular diseases
- 2) Cash's Textbook- General Med & Surgical conditions for Physiotherapists
- 3) Chest Physical therapy & pulmonary rehabilitation by Donna Frownfilter
- 4) Brompton's hospital guide

REFERCE BOOKS

- 1) Physiotherapy in Cardio – Vascular rehabilitation – Webber

- 2) Exercise & the Heart – Wenger
- 3) ECG – by P.J. Mehta
- 4) Cardiopulmonary Physical Therapy by Irwin Scott

PHYSIOTHERAPY IN REHABILITATION

TEXT BOOKS-SOCIOLOGY

- 1) Sachdeva, & Bhusahn- An introduction to sociology – Allahabad; kitab mahal ltd. 1974
- 2) Madan – Indian social problems, Vol-I-Madras – Allied publications 1973

TEXT BOOKS-COMMUNITY MEDICINE

- 1) K. Park – Park's Textbook of Preventive & Social Medicine
- 2) P.K. Mahajan & M.C. Gupta – Textbook of Preventive & Social Medicine

TEXT BOOKS-REHABILITATION

- 1) Physiotherapy in Gynaecological & Obstetrical conditions – by Poldon – Jaypee
- 2) Astrand P A Rodahe K-Text book of Work Physiology
- 3) Therapeutic Exercise – By Kisner
- 4) Text book of Community Medicine & Community Health – by Bhaskar Rao
- 5) Geriatrics Physiotherapy – By Andrew Guccione
- 6) Industrial Therapy – by Glenda Key

REFERCE BOOKS

- 1) Mural K F –Ergonomics: Man in his working environment
- 2) Exercise Physiology-by Mc'Ardle
- 3) Musculoskeletal Disorders in work place: Principle & Practice-by Nordin
Andersons Pope
- 4) Indian Social Problem Vol 2 –by G R Madan
- 5) Disability 2000-RCI
- 6) Legal Rights of disabled in India-by Gautam Bannerjee
- 7) ICF –WHO Health Organisation 2001 publication
- 8) Preventive &Social Medicine –by Park
- 9) Training in the Community for the people with disability –by Hallender Padmini Mendes
- 10) Disabled Village Children-by David Werner
- 11) Chorin C& M Desai, C Gonsalves, 1999, Women & the Law, Vol. I & II Socio-legal
Information Centre Mumbai