Rules & Regulation

For

Bachelor of physiotherapy

(BPT)

Academic programme

Duration: 4 years & 6 months internship

➢ Objective of the Course:

This course will allow the students:

a) To acquire adequate knowledge of basic medical subjects and to develop skills and techniques of therapeutic exercise and therapeutic modalities so that they can manage various medical surgical conditions of patients.
b) To acquire knowledge so that they can point out by assessing the medical and surgical conditions of the patient.
c) To acquire skills in management, research and teaching as well as guidance and counseling of patients.
d) To acquire proper attitude for compassion and concerns for patients and welfare of physically handicapped in the community.
e) To practice moral and ethical values with regard to physiotherapy.

1. ELIGIBILITY

1.1Quality Examination:

A Candidate seeking admission to first year Bachelor in Physiotherapy (BPT); should have passed the Higher Secondary Education of XII Standard in Science Stream (10+2 pattern) conducted by the Secondary Education Board or its equivalent examination conducted by recognized Board/Council with minimum 33% marks.

1.2 Marks:

The selection of students to a course of physiotherapy shall be based on merit provided that:

In case of admission on the basis of qualifying examination, a candidate for admission to BPT course must have passed individually in the subjects of physics, Chemistry, Biology and English and must have obtained minimum 50% marks (for General cast), SC/ ST/ OBC casts can get admission with minimum 40% marks.

1.3 Age:

A candidate seeking admission to Bachelor of physiotherapy course should have completed 16 years of age, as on 31st December of the year of admission.

1.4 Medical Fitness Certificate:

Every candidate should submit a certificate of Medical Fitness from an authorized Medical Officer to the effect, that the candidate is physically fit to undergo physiotherapy course.

DURATION OF COURSE:

- BPT course will be four years followed by compulsory six months rotatory internship.
- Duration will be divided into four professional examinations namely BPT Part-1 at the end of first academic year, BPT-II at the end of second academic year, BPT Part-III at the end of third academic year, BPT Part-IV at the end of fourth academic year,

EXAMINATION:

- There shall be an annual university examination at the end of each academic year in the form of theory papers and practical examinations. The candidate will be required to appear in every subject as specified in the course structure for each year.

DURATION OF EXAMINATION:

- Each theory paper shall be of 3 hrs. Duration.

Detail of examination

Theory and practical Examination

For any theory and practical paper, 20% of the total marks will be added from internal assessment of entire paper, shall be allotted to internal assessment of the entire paper.

1. Instruction to paper setters – The question paper shall cover the entire syllabus of the subject. Instructions, if any, shall be stated in bold letters.

Pattern for paper setting shall as the follows:

If question Paper carries 80 Marks then it should have 12 questions .The students will have to attempt any 10 questions out of 12.

Each question will have 8 marks. i.e. 10X8=80 marks. Rest of the marks will be added from internal assessment marks out of 20 marks.

If question paper carries 50 marks then it should have 6 questions. The students will have to attempt 5 questions out of 6.

Each question will have 8 marks (total marks of question paper 5X8=40). Rest of the marks will be added form internal assessment out of 10 marks.

II. Moderator – There shall be one moderator per paper.

Qualification of the examiner: The examiner should have Masters Degree in physiotherapy with five years of full time teaching experience or BPT with seven years of teaching experience from recognized university for Physiotherapy papers and for medical papers, as per university norms similar to MBBS and BDS.

III. Examiner: Paper setter can be an examiner.

Course of study

First year B.P.T. Course

Sr. No.	Subject	Teaching Hours		
		Theory	Practical	Total
1.	Anatomy	120	80	200
2.	Physiology	150	50	200
3.	Biochemistry	50	-	50
4.	Exercise Therapy-I	100	100	200
5.	Electro therapy-I	100	100	200
6.	Computer Application/English	50	50	100
7.	Orientation to Physiotherapy	50	50	100
8.	Sociology	100	-	100
			Total	1150

Second year B.P.T. Course

Sr. No.	Subject	Teaching Hours		
		Theory	Practical	Total
1.	Pathology and Microbiology	100	-	100
2.	Pharmacology	100	-	100
3.	Exercise Therapy-II	100	100	200
4.	Electro Therapy-II	100	100	200
5.	Psychology and Psychiatry	100	-	100
6.	Community Medicine	100	-	100
7.	Biomechanics and Kinesiology	100	-	100
8.	Physiotherapy Clinical Training	-	400	400
			Total	1300

Third year B.P.T. Course

Sr. No.	Subject	Teaching Hours		
		Theory	Practical	Total
1.	Orthopedics	100	50	150
2.	Surgery and Obs. & Gyene.	100	50	150
3.	Medicine and Pediatrics	150	50	200
4.	Neurology and Neurosurgery	150	50	200
5.	Biostatistics and Research methodology and Professional Management	100		100
6.	Clinical Rehabilitation	150	50	200
7.	Supervised Physiotherapy Practice for outdoor and indoor patients		300	300
			Total	1300

Final year B.P.T. Course

Sr. No.	Subject	Teaching Hours		
		Theory	Practical	Total
1.	P.T. in Orthopedic conditions	100	50	150
2.	P.T. in Surgical and Obs. and Obs. and Gynae conditions	100	50	150
3.	P.T. in Medical and Pediatrics conditions	100	50	150
4.	P.T. in Neurological and Neurosurgical conditions	100	50	150
5.	Clinical Rehabilitation-II	100	50	150
6.	Supervised Physiotherapy practice for indoor and outdoor patients	-	500	500
7.	Project work	-	-	-
			Total	1250

Total teaching and clinical hours (Excluding internship):

1150+1300+1300+1250=5000

SCHEME OF EXAMINATION:

BPT-Part-I (First year) University Examination

Sr.No.	Subject	Subject Code	Theory Marks				Practical Marks				Total Marks
			Theory Marks	Internal Assessment	Total	Minimum Marks	Practical	Internal Assessment	Total	Minimum Marks	
1.	Anatomy	BPT-101	80	20	100	50	80	20	100	50	200
2.	Physiotherapy	BPT-102	80	20	100	50	80	20	100	50	200
3.	Biochemistry	BPT-103	40	10	50	25					50
4.	Exercise Therapy-I	BPT-104	80	20	100	50	80	20	100	50	200
5.	Electro therapy-I	BPT-105	80	20	100	50	80	20	100	50	200
										Total	850

BPT-Part-II (Second year) University Examination

Sr.No.	Subject	Subject Code	Theory Marks				Practical Marks				Total Marks
			Theory Marks	Internal Assessment	Total	Minimum Marks	Practical	Internal Assessment	Total	Minimum Marks	
1.	Pathology and Microbiology	BPT-201	80	20	100	50					100
2.	Pharmacology	BPT-202	80	20	100	50					100
3.	Exercise Therapy-II	BPT-203	80	20	100	50	80	20	100	50	200
4.	Electro Therapy-II	BPT-204	80	20	100	50	80	20	100	50	200
5.	Psychology and Psychiatry	BPT-205	80	20	100	50					100
6.	Community Medicine	BPT-206	80	20	100	50					100
7.	Biomechanics and Kinesiology	BPT-207	80	20	100	50					100
										Total	900

BPT-Part-III (Third year) University Examination

Sr.No.	Subject	Subject Code	Theory Marks				Practical Marks				Total Marks
			Theory Marks	Internal Assessment	Total	Minimum Marks	Practical	Internal Assessment	Total	Minimum Marks	
1.	Orthopedics	BPT-301	80	20	100	50	40	10	50	25	150
2.	Surgery and Obs. & Gynae	BPT-302	80	20	100	50	40	10	50	25	150
3.	Medicine and Pediatrics	BPT-303	80	20	100	50	40	10	50	25	150
4.	Neurology and Neurosurgery	BPT-304	80	20	100	50	40	10	50	25	150
5.	Biostatistics and Research methodology and Professional Management	BPT-305	40	10	50	25					50
6.	Clinical Rehabilitation-I	BPT-306	80	20	100	50	80	20	100	50	200
						Total					**850**

BPT-Part-IV (Fourth year) University Examination

Sr.No.	Subject	Subject Code	Theory Marks				Practical Marks				Total Marks
			Theory Marks	Internal Assessment	Total	Minimum Marks	Practical	Internal Assessment	Total	Minimum Marks	
1.	P.T. in Orthopedic conditions	BPT-401	80	20	100	50	40	10	50	25	150
2.	P.T. in Surgical and Obs. & Gynae. conditions	BPT-402	80	20	100	50	40	10	50	25	150
3.	P.T. in Medical and Pediatric conditions	BPT-403	80	20	100	50	40	10	50	25	150
4.	P.T. in Neurological and Neurosurgical conditions	BPT-404	80	20	100	50	40	10	50	25	150
5.	Clinical Rehabilitation-II	BPT-405	80	20	100	50	40	10	50	25	150
6.	Project work	BPT-406		-	-	-	50	-	-	25	50

*****Passing in theory and practical examination separately shall be necessary by securing at least 50% percent marks each.

INTERNAL ASSESMENT

- It will be for theory and practical both.
- It will be done through the Whole year.
- Candidate must obtain at least 50% marks in theory and practicals separately in internal assessment to be eligible for the annual university examination.

- Internal assessment (Theory) will be done follows:

a)	Mid-term and term examinations	= 10 marks
b)	Assignments/Projects/class test/Clinical Presentations	= 05 marks
c)	Attendance	= 05 marks
	Total	**= 20 marks**

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

a)	Laboratory manual	= 10 marks
b)	Day to day performance	= 05 marks
c)	Attendance	= 05 marks
	Total	**= 20 marks**

CRITERIA FOR PASSING

- A candidate is declared to have passed University examination in a subject, if he/she secures 50% of the marks in theory and 50% in practicals separately. For computation of 50% marks in theory, the marks scored in the internal assessment (theory) shall be added to the University conducted written examination and for passing in practical,the marks scored in internal assessment (practical) shall be added in the marks scored in practical exam conducted by university together.

GRACE MARKS:

- If a candidate fails in one subject (theory only) in the annual University examination, five grace marks will be given to the candidate by the University before the declaration of result.
- Candidate failing in practical examination will not be given grace marks .

SUPPLEMENTARY EXAMINATION:

- A candidate failing in a subject but securing at least 30% aggregate marks will be required to appear in the university examination after 3 months in that subject/ subjects while attending classes of next year. Those who secure less than 30% aggregate marks will be required to appear in all the subjects.
- If the candidate fails in supplementary examination, his/her session will be shifted by one year. The candidate will have take admission in the previous year and pay the tution fee for the academic year. He/she will have to appear in all the subjects in the examination.
- Supplementary examination will be held not earlier than 3 months and later than 6 months from the date of annual University examination.

DIVISION:

- Candidate will be awarded division at the end of fourth academic year as follows:

Distinction - 75% and above marks in any subject.
First division - 60% and above in the aggregate of marks of all subjects.
Second division – 50% or more but less than 60% in the aggregate of marks of all subjects.

DEGREE:

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

INTERNSHIP :

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

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

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

The Internship should be rotatory and cover clinical branched concerned with Physiotherapy such as Orthopaedics, Cardiothoracic including ICU, Neurology, Neurosurgery, Paediatrics, General Medicine, General Surgery, Obestrics and Gynaecology both inpatients and outpatient services.

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

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

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

Following parameters/ guidelines have been suggested:

a. It is mandatory for the Institution to have its own Physiotherapy clinic fully furnished with all the necessary equipments as per the curriculum of the Program.

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

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

First Bachelor in Physiotherapy

(1-YEAR duration)

ANATOMY

Subject code: BPT-101

GENERAL ANATOMY-

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

Cell (Parts, Name of Cytoplasm organelles and inclusion with their Functions)

Epithelium Types with examples and light microscopic structure.

Musculoskeletal system:

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

Upper extremity:

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

Lower Extremity:

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

Spine and thorax

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

- Thoracic cage
- Radiographic identification of bone and joints
- Applied anatomy

Head and neck:

- Cranium
- Facial Muscles – origin, insertion, actions, nerve supply
- Temporo mandibular Joints – structure, types of movement

Nervous system

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

Sensory system

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

Cardiovascular system

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

Lymphatic system

- Circulation, structure & functions

- Lymph nodes

Respiratory system

- Structure of upper and lower respiratory tract

Thorax:

- Pleural cavities & pleura
- Lungs and respiratory tree
- Heart and great vessels
- Diaphragm

Digestive system

- Parts of digestive system
- Abdominal cavity – divisions
- Muscles of abdominal wall
- Liver
- Pancreas
- Spleen
- Alimentary canal
- Gall bladder
- Intestine (small & large)

Urinary and Reproductive system

- Urinary system
- Pelvic floor, innervations
  - Kidney, Ureter, bladder, urethra
- Genital system – male and female
  - Reproductive system of male
  - Reproductive system of female

Endocrine system

- Pituitary gland
- Thyroid
- Parathyroid

PRACTICAL

1. Identification and description of all anatomical structures.
2. The learning of Anatomy is by demonstration only through dissected parts, models, charts, etc.
3. Demonstration of dissected parts (upper extremity, lower extremity, thoracic & abdominal viscera, face and brain).
4. Demonstration of skeleton – articulated and disarticulated.
5. During the training more emphasis will be given on the study of bones, muscles, joints, nerve supply of the limbs and arteries of limbs.
6. Surface anatomy:

   - Surface bony land mark.

PHYSIOLOGY

Subject Code: BPT-102

THEORY

1. General Physiology

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

2. Blood

- Introduction- composition & function of cell organelles
- Structure of cell membrane
- Transport across cell membrane
- Intercellular communication
- Homeostasis

3. Cardiovascular system

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

4. Respiratory system

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

5. Nerve Muscle Physiology

- Muscles- classification, structure, properties, Excitation contraction coupling
- Motor unit, EMG, factors affecting muscle tension,
- Muscle tone, fatigue, exercise
- Nerve- structure and function of neurons, classification, properties
- Resting membrane potential & Action potential their ionic basis
- All or None phenomenon
- Neuromuscular transmission
- Ionic basis of nerve conduction
- Concept of nerve injury & Wallerian degeneration
- Synapses
- Electrical events in postsynaptic neurons
- Inhibition & facilitation at synapses
- Chemical transmission of synaptic activity
- Principal neurotransmitters.

6. Nervous system

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

7. Renal System

- Physiology of kidney and urine formation
- Glomerular filtration rate, clearance, Tubular function
- Physiology of urinary bladder

8. Digestive System

- Digestion & absorption of nutrients
- Gastrointestinal secretion & their regulation
- Function of Liver & Stomach.

9. Endocrinology

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

10. Male & female reproductive system

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

PRACTICAL

1. Examination of pulse, B.P., Respiratory rate.

2. Reflexes

3. Spirometery to measure various lung capacities & volumes, Respiratory rate, Tidal volume, IRV,IC,ERV,EC, residual volume in Spirometery.

4. Estimate of Haemoglobin, R.B.C., W.B.C., TLC, DLC, ESR count.

5. Blood indices, Blood grouping, Bleeding & Clotting time.

Biochemistry

Subject code: BPT-103

Syllabus-

1] Cell biology

i. Membrane, structure & function
ii. Junction of intracellular organelle in brief- [no structural details needed]

2] Carbohydrates

i. Chemistry-definition, classification with examples
ii. Functions of carbohydrates with muccopolysaccharides [in details]
iii. Digestive & absorption of carbohydrates
iv. Glycogenesis, Glycogenolysis & their regulation, Cori's Cycle
v. Gluconeogenesis-significance of H.M.P. shunt
vi. Hormonal regulation of blood sugar, Metabolic disorders of glycogen, lactose intolerance, Diabetes mellitus.

3] Proteins

i. Chemistry-definition, function, classification of Amino acids, protein structure, effect of temperature on proteins, denaturation, coagulation
ii. Digestion & absorption of proteins
iii. Metabolism- De-amination, Transmethylation, Transamination & its importance, Detoxificatoin of ammonia in the body & urea cycle

4] Lipids

i. Chemistry, definition, classification of lipids & fatty acids with examples & functions
ii. Digestive & absorption of lipids
iii. Metabolism- Beta oxidation of fatty acids & its energetic, Ketone bodies formation & utilization, cholesterol & its importance [no biosynthesis needed], classification, source & function of lipoproteins
iv. Fate of acetyl- Co A (in brief)
v. Fate of Glycrol (in brief)

5] Nucleic Acids

D.N.A./ R.N.A.- definition, structure & function, Catabolism of purine – Gout

6] Enzymes

i. Definition, classification, factors affecting enzyme action
ii. Co-enzyme & Isoenzymes with their significance
iii. Clinical & therapeutic use of enzymes

7] Vitamins

i. Water & Fat soluble with definition & classification
ii. Daily requirement, absorption & transport, deficiency & toxicity

8] Metabolism

i. Phosphorous, Calcium, Iron, Zinc, Iodine - source, absorption, transport, excretion, function & disorder

9] Acid- Base Balance, Water – Electrolyte balance & imbalance

10] Hormones

Definition, classification, mechanism of action

11] Muscle Contraction

Biochemical events during contraction;

12] Connective Tissue

Biochemistry of connective tissues

13] Nutrition

i. Importance of nutrition, Calorimetry, Resporatory quotient & its significance
ii. Energy requirement with reference to age, sex, thermogenesis, Specific dynamic action of fiids
iii. Balanced Diet and Role of Fibers in diet
iv. Deficiency disorders (Protein energy malnutrition)

TEXTBOOKS

1] Biochemistry-by Dr. Deb Jyoti Das,

2] Biochemistry-by-Dr Satyanarayan

3] Text book of Biochemistry for Medical students by- Dr. Vasudevan/ Shri Kumar

REFERENCE BOOK

1] Review of Biochemistry [24 edition] by Harpar

SCHEME OF EXAMINATION- [THEOTRY ONLY]

Students should get minimum 50% marks for passing the examination.

THEORY-40 MARKS + INTERNAL ASSESSMENT-10 MARKS

Section-A

MCQ - Q-1] Single best answer	[10X1]	10 marks

Section-B

SAQ – Q-2] To attempt any FIVE out of Six answer-	[5X3]	15 marks

Section-C

SAQ – Q-3] To attempt any THREE out of Four answer-	[3X5]	15 marks

INTERNAL ASSESSMENT

One Terminal & one prelim having 40 marks each in theory. I.A. marks out of 10 for theory.

Student will be eligible to appear for University examination if he/she gets minimum 35% marks.

EXERCISE THERAPY – I

Subject Code: BPT-104

THEORY

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

PRACTICAL

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

ELECTRO THERAPY-I
Subject Code: BPT-105
THEORY

1. Basic components of electric current – electrons, protons, neutrons, ions, matter, molecules
2. Current electricity – static electricity, electric charge, conductors, conduction of electricity, resistance, factors effecting resistance with example in human body, insulation, ohms law
3. Magnetism, theories of magnetism, properties of magnet.
4. Electromagnetic induction, electromagnetic radiation, laws governing radiations – Grothus , cosine law, inverse square law, law of reflection, rafraction.
5. Electrical components – transformer, capacitor, valves
6. Types of electrical current, wave forms, current modulation – continuous, burst, beat, surge.
7. Safety issues while using electrical equipments – for patients and therapist
8. Nerve response to electrical stimulation – polarization, depolarization and propagation of impulse.
9. Pain – types of pain, pain pathway, theories of pain, Gate control theory of pain, pain modulation at various levels.
10. Low frequency currents:
    a) Neuromuscular electrical stimulation – physiological effects, therapeutic uses of electrical stimulation techniques – electrodes type, electrode size, electrode placement, stimulation points, methods of reducing skin electrode resistance, contraindications and precautions.

    b) Russian stimulation.
    c) Trans cutaneous Electrical Nerve stimulation (TENS) – therapeutic uses of TENS, types, electrode placement in TENS, contraindications and precautions.
    d) Iontophoresis – mechanism, biophysical effect, medication dosage, and medicated ions used, techniques of application.

11. Electro diagnostic test – FG test, strength duration curve, Chronaxie, Rheobase
12. Interferential therapy (IFT) – physiological effects, therapeutic indications, methods of application, sweep, base, contraindication and precautions.

PRACTICAL

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

PATHOLOGY & MICROBIOLOGY
Subject Code: BPT-201
THEORY
PATHOLOGY

1. Introduction to Pathology
2. Cell injuries:
   - Aetiology and Pathogenesis with a brief recall of important aspects of normal cell structure.
   - Reversible cell injury: Types, Sequential changes, Cellular swellings, vacuolation, Hyaline changes, Mucoid changes.
   - Irreversible cell injury: Types of Necrosis & Gangrene, Autolysis.
   - Pathologic calcification: Dystrophic and Metastatic. Intracellular Accumaltions.
3. Inflammation and Repair
   - Acute inflammation: features, causes, vascular and cellular events, Inflammatory cells and Mediators.
   - Chronic inflammation: Causes, Types, Classification nonspecific and granulomatous with examples.
   - Repair, Wound healing by primary and secondary union, factors promoting and delaying the process. Healing in specific site including bone healing.
4. Circulatory Disturbances
   -Ischemia and Haemorrhage
   - Edema: Pathogenesis and types.
   - Thrombosis and Embolism: Formation, Fate and Effects.
   - Infarction: Types, Common sites.
   - Shock: Pathogenesis, types, morphologic changes.
5. Growth Disturbances and Neoplasia
   - Atrophy, Hypertrophy, Hyperlasia, Aplasia, Hypoplasia, dysplasia. Precancerous lesions.
   - Neoplasia: Definition, classification, Biological behavior: Benign and Malignant (brief idea), Carcinoma and Sarcoma.
6. Hematology
   - Anemia: Classification, clinical features & lab diagnosis (brief idea).
7. Respiratory System
   -COPD, Tuberculosis, Pneumonia
8. Cardiovascular Pathology
   - Congenital Heart diseases, Coronary heart disease, Rheumatic Heart disease.
9. Hepato Biliary Pathology
   - Jaundice: Types, aetio-pathogenesis and diagnosis.
10. Musculoskeletal System
   - Osteomyelitis: acute, chronic
   - Metabolic diseases: Rickets/ Osteomalacia, osteoporosis.
   - Arthritis: Rheumatoid, Osteoarthritis, Gout.
11. Neuropathology
   - CNS infections, Demyelinating diseases, Degenerative diseases.
   - PNC & Muscles:- Neuropathy, Poliomyelitis, Myopathy.

MEDICAL MICROBIOLOGY
THEORY

1. Classification of microorganism : Bacterial Morphology, cells structure, difference between prokaryotes & eukaryotes, capsule, flagella, fimbrae, pilli, cell wall, plasma membrane, cytoplasm, ribosomes etc.
2. Bacteriology – Classification of Bacteria, Morphological characteristics of different bacteri.
3. Sterilization & disinfection :
    a) Physical Methods
    b) Chemical Method
    c) Mechanism of Sterilizations
    d) Difference between sterilization and disinfection.

4. Infection – Source of infections, entry & its spread.
5. Virology: - Viral infections with special emphasis on poliomyelitis, Rabies, HIV infection.
6. Opportunistic infections (in brief).
7. Immunity
    a) Active, passive
    b) Natural, acquired
8. Allergy & Hypersensitivity
9. Bacterial diseases: -
    1. Respiratory tract infection: - Pneumonia & Tuberculosis
    2. Enteric infections – Typhoid Fever
    3. Leprosy
    4. Tuberculosis
    5. Wound infections
    6. Sexually transmitted diseases
10. Nosocomial Infections

PHARMACOLOGY
Subject Code: BPT-202

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

PSYCHOLOGY
Subject Code: BPT-203

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

a) Mental retardation,
b) Autistic behavior
c) Learning disabilities.

PSYCHIATRY

1. Modalities of psychiatric treatment
2. Psychiatric illness and physical therapy link
3. Brief description of Etio-pathogenesis, manifestations, and management of psychiatric illnesses –
   a. Anxiety neurosis
   b. Depression
   c. Obsessive compulsive neurosis
   d. Psychosis – Definition & types
   e. Maniac-depressive psychosis
   f. Post-traumatic stress disorder
   g. Psychosomatic reaction: Stress and Health, theories of Stress – Illness Link

4. Brief description of Etio-pathogenesis, manifestation, and management of psychiatric illness

   a. Drug dependence and alcoholism
   b. Personality disorders

5. Child psychiatry:

Brief descriptions of manifestations, and management of childhood disorders – attention deficit syndrome, and behavioral disorders

6. Geriatric Psychiatry (in brief)

BIOMECHANICS

Subject Code: BPT-204

THEORY

SECTION -I

1. **Basic Concepts in Biomechanics: Kinematics and Kinetics [5 Hours]:**

   a) Types of Motion
   b) Location of Motion
   c) Direction of Motion
   d) Magnitude of Motion
   e) Definition of Forces
   f) Force of Gravity
   g) Reaction forces
   h) Equilibrium
   i) Objects in Motion
   j) Force of friction
   k) Concurrent force systems
   l) Parallel force systems
   m) Work
   n) Moment arm of force
   o) Force components
   p) Equilibrium of levers

2. **Joint structure and Function [4 Hours]:**

   a) Human Joint design
   b) Materials used in human joints
   c) General properties of connective tissues
   d) Joint function
   e) Joint motion

3. **Muscle structure and function [3 Hours]:**

   a) Mobility and stability functions of muscles
   b) Elements of muscle structure
   c) Muscle function
   d) Effects of immobilization, and aging

4. **Biomechanics of the Thorax and Chest wall [5 Hours]:**

   a) General structure and function
   b) Rib cage and the muscles associated with the rib cage
   c) Ventilatory motions: its coordination and integration
   d) Developmental aspects of structure and function
   e) Changes in normal structure and function I relation to pregnancy, scoliosis and COPD

5. **The Temporomandibular Joint [4 Hours]:**

   General features, structure, function and dysfunction

6. **Biomechanics of the vertebral column [10 Hours]:**

   a) General structure and function

   b) Regional structure and function – Cervical region, thoracic region, lumbar region, sacral region

   c) Muscles of the vertebral column

   d) General effects of injury and aging

SECTION - II

1. **Biomechanics of the peripheral joints [54 Hours]:**

   a) The shoulder complex: Structure and components of the shoulder complex and their integrated function.

   b) The elbow complex: Structure and function of the elbow joint – humeroulnar and humeroradial articulations, superior and inferior radioulnar joints; mobility and stability of the elbow complex; the effects of immobilization and injury.

   c) The wrist and hand complex: Structural components and functions of the wrist complex; structure of the hand complex; prehension; functional position of the wrist and hand.

   d) The hip complex: Structure and function of the hip joint; hip joint pathology - arthrosis, fracture, bony abnormalities of the femur.

   e) The knee complex: Structure and function of the knee joint – tibiofemoral joint and patellofemoral joint; effects of injury and disease.

   f) The ankle and foot complex.: structure and function of the ankle joint, subtalar joint, talocalcaneonavicular joint, transverse tarsal joint, tarsometatarsal joints, metatarsophalangeal joints, interphalangeal joints, structure and function of the plantar arches, muscles of the ankle and foot, deviations from normal structure and function – Pes Planus and Pes Cavus

2. **Analysis of Posture and Gait [15 Hours] :** Static and dynamic posture, postural control, kinetics and kinematics of posture, ideal posture analysis of posture, effects of posture on age, pregnancy, occupation and recreation; general features of gait, gait initiation, kinematics and kinetics of gait,
   energy requirements, kinematics and kinetics of the trunk and upper extremities in relation to gait, stair case climbing and running, effects of age, gender, muscle weakness, paralysis, asymmetries of the lower extremities, injuries and malalignments in gait; Movement Analysis; ADL activities like sitting – to standing, lifting, various grips , pinches.

Recommended Text Books:

1. Joint Structure and Function – A comprehensive Analysis by Cynthia Norkin.
2. Brunnstrom's Clinical Kinesiology by Laura Smith, Elizabeth Beth Weiss, and Don Lehmkuhl.

Recommended Reference Books:

1. Clinical Kinesiology for Physical Therapist Assistants by Lippert

2. Applied Kinesiology: A Training Manual and Reference Book of Basic Principles and Practices by Robert Frost (Mar 28, 2002)

3. Kinesiology: The Mechanics and Pathomechanics of Human Movement by Carol A. Oatis

4. Kinesiology by K. Wells; Sauder's Publications.

5. Basic Biomechanics of the Musculoskeletal System by Margareta Nordin and Victor H. Frankel

EXERCISE THERAPY – II
Subject Code: BPT-205
Min. Hrs. : Theory - 100 Hrs., Practical - 100 Hrs.
THEORY

1. **Joint mobilization:**

Definition – Mobilization, Manipulation, indications, limitations, contraindications and precautions, applications of Mobilization technique to various joints. Principles of Maitland, Mulligan and Meckzi joint Manipulation techniques.

2. **Stretching:**

Definition, properties of soft tissue, mechanical and neurophysiological properties of connective tissue, mechanical properties of non contractile tissue. Determinants, type and effect of stretching, precautions, general applications of stretching technique.

3. **Resisted exercise:**

Definition – strength, power, endurance. Guiding principle of resisted exercise, determinants, types Manual and Mechanical Resistance Exercise, Isometric Exercise, Dynamic Exercise - Concentric and Eccentric, Dynamic Exercise - Constant and Variable Resistance, Isokinetic Exercise, Open-Chain and Closed-Chain Exercise, precautions, contraindications

Progressive Resistance Exercise - de Lormes, Oxford, MacQueen, Circuit Weight Training, Plyometric Training—Stretch-Shortening Drills, Isokinetic Regimens

4. **Proprioceptive Neuromuscular Facilitation** – Principles, Diagonal patterns of movements, Basic procedures, Upper Extremity Diagonal patterns, Lower Extremity Diagonal Patterns. Technique in PNF – Rhythmic Initiation, Repeated Contractions, Reversal of Antagonists, Alternating Isometrics, Rhythmic Stabilization.
5. **Aerobic Exercises** – Definitions, Physiological response to Aerobic Exercise, Evaluation of aerobic capacity – exercise testing, Determinant of Aerobic Exercise, Physiological Changes with Aerobic Training, Aerobic Exercise Program, Applications of Aerobic Program in patients with chronic illness.
6. **Hydrotherapy:**

Definitions, Goals and Indications, Precautions and Contraindications, Properties of water, Therapeutic Exercises in Hydrotherapy, Special equipments used.

7. **Balance training:**

Definition and Key terms, Balance control, Components of balance, Balance Impairment, Examination of Impaired Balance, Balance training Exercises.

8. **Posture:**

Normal Postural Control, Postural Alignment, Postural Stability, Postural Impairment and Mal-Alignment, Postural Training.

9. **Breathing Exercises:**

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

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

10. **Gait Training:**

Definition, Different methods of Gait Training, Gait Training in Parallel Bars,

Walking Aids: Types: Crutches, Canes, Frames; Principles and training with walking aids**.**

11. **Soft Tissue Injury:**

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

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

PRACTICAL

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

ELCTROTHERAPY - II
Subject Code: BPT 206
Min. Hrs. : Theory - 100 Hrs., Practical - 100 Hrs.

THEORY

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

PRACTICAL

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

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

COMMUNITY MEDICINE
Subject Code: BPT-206
Min. Hrs. : 80 Hrs.

1. **Health and Disease: Definitions**, Concepts, Dimensions and Indicators of Health, Concept of well-being, Spectrum and Determinants of Health, Concept and natural history of Disease, Concepts of disease control and prevention, Modes of Intervention, Population Medicine, The role of socio-economic and cultural environment in health and disease.
2. **Epidemiology, definition and scope. Principles of Epidemiology and Epidemiological methods:** Components and Aims, Basic measurements, Methods, Uses of epidemiology, Infectious disease epidemiology, Dynamics and modes of disease transmission, Host defenses and Immunizing agents, Hazards of Immunization, Disease prevention and control, Disinfection. Screening for Disease: Concept of screening, Aims and Objectives, Uses and types of screening.
3. **Epidemiology of communicable disease**: Respiratory infections, Intestinal infections, Arthropodborne infections, Zoonoses, Surface infections, Hospital acquired infections Epidemiology ochronic non-communicable diseases and conditions: Cardio vascular diseases: Coronary heart disease, Hypertension, Stroke, Rheumatic heart disease, Cancer, Diabetes, Obesity, Blindness Accidents and Injuries.
4. **Public health administration**- an overview of the health administration set up at Central and state levels. The national health program-highlighting the role of social, economic and cultural factors in the implementation of the national programs. Health problems of vulnerable groups- pregnant and lactating women, infants and pre-school children, occupational groups.
5. Health programs in India: Vector borne disease control program, National leprosy eradication program, National tuberculosis program, National AIDS control program, National program for control of blindness, Iodine deficiency disorders (IDD) program, Universal Immunisation program, Reproductive and child health program, National cancer control program, National mental health program. National diabetes control program, National family welfare program, National sanitation and water supply program, Minimum needs program.
6. **Demography and Family Planning**: Demographic cycle, Fertility, Family planning-objectives of national family planning program and family planning methods, A general idea of advantage and disadvantages of the methods.
7. **Preventive Medicine in Obstetrics, Paediatrics and Geriatrics**: MCH problems, Antenatal, Intranatal and post natal care, Care of children, Child health problems, Rights of child and National policy for children, MCH services and indicators of MCH care, Social welfare program for women and children, Preventive medicine and geriatrics.
8. **Nutrition and Health**: Classification of foods, Nutritional profiles of principal foods, Nutritional problems in public health, Community nutrition program.
9. Environment and Health: Components of environment, Water and air pollution and public health: Pollution control, Disposal of waste, Medical entomology.
10. **Hospital waste management**: Sources of hospital waste, Health hazards, Waste management.
11. **Disaster Management**: Natural and man made disasters, Disaster impact and response, Relief phase, Epidemiologic surveillance and disease control, Nutrition, Rehabilitation, Disaster preparedness.
12. **Occupational Health:** Occupational environment, Occupational hazards, Occupational diseases, Prevention of occupational diseases. Social security and other measures for the protection from occupational hazard accidents and diseases. Details of compensation acts.

13. **Mental Health**: Characteristics of a mentally healthy person, Types of mental illness, Causes of mental ill health, Prevention, Mental health services, Alcohol and drug dependence. Emphasis on community aspects of mental health.
14. **Health Education**: Concepts, aims and objectives, Approaches to health education, Models of health education, Contents of health education, Principles of health education, Practice of health education.

THIRD BECHOLAR IN PHYSIOTHERAPY

ORTHOPAEDIC

1. Fractures dislocations and regional orthopedic disorders in relation to orthopedic management.

2. Deformities: Common congenital and acquired deformities of foot, knee, hip, shoulder, elbow and wrist including hand and spine. Cervical rib, torticollis, metatarsalgia, claw hand and orthopedic management.

3. Inflammatory conditions and lesions of joints and bones. Osteomyelitis, tuberculosis, pyogenic infection. Osteoarthritis, T.B. Joints, Tenosynovitis, synovitis, capsulitis, endonitis, Osteoporosis and Osteomalacia, sciatica, low back pain, brachial neuralgia Rheumatological disorders in detail and orthopedic management & above conditions.

4. Operative Procedures, Amputation Common sites, causes & management, Arthroplasty of Joints, joint replacement (total and partial), Osteotomy

5. Peripheral nerve injuries-their management.

6. Trauma and Trauma care.

7. Reconstructive surgeries for the rehabilitation of Poliomyelitis, traumatic condition, spine, hand and foot.

8. Principle of Tendon transfer and its procedure.

9. Pediatrics musculo-skeletal conditions and management.

10. Sports injuries and its management.

11. Radiological examination.

PRACTICAL:

1. Case demonstration of various conditions, Exposure to various orthopedics techniques & Procedures.

2. General viva.

SURGERY INCLUDING OBSTETRICS & GYNAECOLOGY

I) General Surgery

1. Principle of Pre and post operative management of surgical patients.
2. Common pre and post operative complications.
3. Surgical intensive care.
4. Description of events frequently accompanying in general anesthesia, blood transfusion and physiological response of the body to surgery.
5. Abdominal surgery: Incisions, complications and management of various abdominal surgeries.
6. Wound, Sinuses and ulcers.
7. Burns: Degrees of burns and management and reconstructive surgery following burns and complications of Burns.

II) Cardiothoracic Surgery

Incisions for cardiothoracic surgery – General Pre and post operative management of cardio-thoracic surgery – various surgical procedures for various chest and cardiac conditions & diseases.

III) OBS and GYN

1. Anatomy of pelvic organs mechanism & physiology of pelvic floor sphineter muscles.

2. Pregnancy stage of pregnancy – Labour - Stages of labour – delivery, Menopause effects in emotions and musculo- skeletal system & common gynecological problems.

IV) Plastic surgery:

Principles of cineplasty, tendon transplant, types of grafts, surgery of hand with emphasis on management of traumatic and leprosy.

PRACTICAL:

1. Case demonstration of various conditions, Exposure to various surgical techniques & procedures.
2. General viva.

Medicine including paediatrics

I. General Medicine

1. Introduction of Medicine.

2. Diseases of respiratory System

Physiological, clinical presentation in relation to chronic obstructive Pulmonary Disease

Bronchial asthma

Pneumonia

Bronchiectasis

Pleural effusion & Empyema thoracis

Pneumothorax

3. Diseases of Kidney

Physiology, clinical presentation in relation to

A R F

C R F

4. Hematological Diseases

Iron deficiency A

Megaloblastic A

Thallessemia

Physiology, clinical presentation in relation to Hemophilia

5. Endocrine & Metabolic Diseases.

Vit. D & Calcium metal & parathymic gland disorders

6. Nutritional Diseases

Physiology, clinical presentation in relation to Obesity

7. Connective tissue Diseases

Physiology, clinical presentation in relation to Rheumatoid arthritis

Gout

8. Infectious Diseases

Tetanus

Leprosy

9. HIV & AIDS

1. Cardiovascular dieases

2. Physiology, clinical presentation in Ischemic heart disease.

3. Physiology, clinical presentation in Congestive heart failure.

4. Peripheral Vascular disease & Deep vein thrombosis, pulmonary embolism

PAEDIATRICS

1. Describe growth and development of a child from birth to 12 year including physical, social, adaptive development.

2. List the maternal and neonatal factors contributing to high risk pregnancy. The neonate: inherited diseases.

3. Briefly describe community programmes: International (WHO), national and local for prevention of poliomyelitis, blindness, deafness mental retardation and hypothyroidism. Outline the immunization schedule for children.

4. Cerebral palsy; Define and briefly outline etiology of prenatal, peri-natal and postnatal causes, briefly mention pathogenesis, types of cerebral palsy (Classification), findings on examination, general examination of C.N.S., Musculoskeletal and respiratory system.

   Briefly outline associated defects: Mental retardation microcephally, blindness, hearing and speech impairment, squint and convulsions.

   Prevention: Appropriate management of high risk pregnancies prevention of neonatal and postnatal infections, metabolic problems.

5. Muscular Dystrophy: Outline various forms, modes of inheritance and clinical manifestation physical finding in relation to disabilities progression of various forms and prognosis. Describe treatment goals in forms which are and are not fatal.

6. Spinabifida, Meningomyelocele: Outline development, clinical features lower limb, bladder and bowel control, complications UTI & hydrocephalus,

7. Still's disease: Classification, pathology in brief, physical findings course & prognosis. Outline treatment, prevention and correction of deformity.

8. Acute C.N.S. infections: Classify (Bacterial and viral) and outline the acute illness & Physiology, clinical presentation.

9. Normal diet of new born and child: List dietary calorie, fat, protein mineral and vitamin requirement in a normal child and in a child with malnutrition.

10. Lung infections: Physiology, clinical presentation in relation to Bronchiectasis, lung abscess and bronchial asthma, cystic fibrosis.

11. Cardio respiratory rehabilitation in children.

PRACTICAL:

1. Clinical exposure to various conditions

2. General Viva

NEUROLOGY AND NEUROSURGERY

Neurology

1. General principles of neurological and neurophysiological and diagnosis.
2. Cerebro- vascular diseases
3. Cerebral vascular accident
4. Acute infections of C N S
5. Degenerative diseases with special emphasis on Parkinsonism and other extra-pyramidal disorders
6. M S & other demylinating disease.
7. Motor neuron diseases.
8. Diseases of peripheral nerves
9. Diseases of muscles

Neurosurgery

1. Head Injury – Causes and mechanism of head injury subdural, Epidural and intracranial bleeding types of neurological, disorders following head injury & Management.
2. Epilepsy.
3. Spinalcord injury and its management.
4. Peraplegia, Hemiplegia, quadriplegia and their management.
5. Neurogenic bladder classification and management.
6. Pediatric conditions meningococele, Meningomyelocele
7. Peripheral nerve injuries, management
8. Surgical management of CVA

PRACTICAL

1. Clinical exposure to various conditions
2. General Viva.

BIOSTATISTICS & RESEARCH METHODOLOGY & PROFESSIONAL MANAGEMENT

1. Review of literature.
2. Study design.
3. Sample size.
4. Sampling variability & significance.
5. Protocol writing.
6. Ethical aspects.
7. Data collection analysis, interpretation and presentation.
8. Common statistical terms.
9. Measures of location, average & percentiles.
10. Variability & its measures.
11. Normal distribution & normal curve.
12. Probability.
13. Significance of difference in mean.
14. Chi- Square test.
15. Correlation & regression.
16. Demography & vital statistics.
17. Correlation of measures of population & vital statistics.
18. Use of Micro Computer in Research.
19. Professional management ethics, administration, budget and development of organization.

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CLINICAL REHABILITATION - I

1. Introduction to Rehabilitation medicine.
2. Definition concerned in the phase of disability process. Explanation of its aims & principles. Scope of rehabilitation.
3. Definition concerned with the causes of Important Functional limitation and Disability.
4. Present Rehabilitation Services.
5. Legislations for rehabilitation services for the Disabled.
6. Rehabilitation Team & its members, their role.
7. Community & Rehabilitation including C.B.R.
8. Contribution of Social Worker towards rehabilitation.
9. Vocational evaluation & Goals for disabled, role of Vocational Counselor.
10. Architectural barriers possible modifications in relation to different disabled conditions.
11. Achieving functional independence.
12. Concepts in cardiac rehabilitation
13. Concepts in pulmonary rehabilitation
14. Deconditioning, conditioning & benefits of exercise
15. Spinal cord injury rehabilitation
16. Occupational rehabilitation
17. Concepts in geriatric rehabilitation
18. Introduction to sports medicine, concept of team, approach to sports physiotherapy.

PRACTICAL

A. Practical demonstration of different types of Orthoses / Prosthesis / Mobility aids / Assistive.

B. Demonstration of disability evaluation procedure.

FORTH bachelor in PHYSIOTHERAPY

P.T. IN ORTHOPAEDIC CONDITIONS

Introduction:

Brief review of the orthopaedic conditions and various physiotherapeutic modalities, aim and means and techniques of physiotherapy should be taught.

Dislocations: Classification – types of displacements methods of immobilization. Healing of fractures and factor influencing union, non- union, delayed union etc.

Specific fracture and their complete physiotherapeutic management

Physiotherapeutic management of fracture of spine with paraplegia and without neurodeficit.

Physiotherapy in relation to soft tissue injuries.

Physiotherapy in relation to amputation.

Physiotherapy in relation to various deformities of all regions

PRACTICAL

1. Various techniques of Physiotherapy for the above mentioned conditions/ diseases should be demonstrated and practiced by the students.
2. Assessment planning and management of orthopedics conditions
3. General Viva.
4. Piratical record

P.T. in surgical conditions including Obs. & Gyane.

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

Pre and Post Operative Physiotherapy management of following abdominal surgical conditions including incisions. Pre and post operative complications.

- Herniorraphy
- Nephrectomy
- Radical Mastectomy

Postural drainage & respiratory physiotherapy in CTVS
Physiotherapy in patients on ventilators
Pre and post operative physiotherapy management of following conditions.

- Thorectomy.
- Lobectomy.
- Thoraco Plasty.
- Pneumonectomy

pre and post operative physiotherapy management of cardiac surgery, open-heart surgery.
Burn & its classification Physiotherapy management.
Pre & Postoperative physiotherapy of skin grafting.
Physiotherapy of cases after reconstructive surgery of hand.
Physiotherapy in obstetrics.
Physiotherapy in following Gynaecological conditions- PID, Stress incontinence, prolapse uterus, etc.
Pre and Post operative physiotherapeutic management of Neuro- Surgical conditions and complications.
Peripheral Nerve Injuries. Pre and post operative physiotherapy management of Nerve Repair / Grafting.
Physiotherapy in head injuries.

PRACTICAL:

1. Various techniques of Physiotherapy for the above mentioned conditions/diseases should be demonstrated and practiced by the students.
2. Assessment planning and management of Surgical conditions.
3. General viva.
4. Piratical record

P.T. in Medical conditions including paediatrics

Introduction: Brief review of the following medical condition and various modalities of Physiotherapy, aims, mean and techniques of physiotherapy should be taught.
Physiotherapy in diseases of respiratory system
An introduction of breathing exercises and postural drainage in detail.
Physiotherapy of Oedema.
Physiotherapy of Rheumatoid Arthritis and Rheumatic fever.
Causes and physiotherapy of general debility.
Physiotherapy of congestive heart failure, myocardial infarction & peripheral vascular diseases.
Physiotherapy in relation to following neurological diseases -

- Hemiplegia
- Cerebral palsy
- Tetraplegic syndrome
- Multiple sclerosis
- Tabes Dorsalis
- Transverse myelitis
- Poliomyelitis
- Parkinsons disease
- Motor neuron disease
- Poly Neuritis Ataxia
- Extra Pyramidal Lesion
- Peripheral Neuropathy
- Peripheral Nerve Injuries
- Sciatica
- Brachial Neuritis and Neuralgia
- Facial palsy and bell's palsy
- Syringomyelia
- Myopathy and various types of muscular dystrophy

PRACTICAL

1. Various techniques of Physiotherapy for the above mentioned conditions/diseases should be demonstrated and practiced by the students.
2. Assessment planning and management of Medical conditions General viva.
3. Piratical record.

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P.T. in Neurological and Neurosurgical conditions

Description

Following the basic science and clinical science, this course introduces the students to the neurological conditions which commonly cause disability.

Objectives

The objectives of this course is that after 300 hours of lectures demonstrations, in addition to clinics, the student will be above to demonstrate and understanding of neurological conditions causing disability and their management.

In addition the student will be above to fulfill with 75% accuracy (as measured by written, oral & practical internal evaluation the following objectives of the course.

OUTLINE

A. Neuroanatomy

Review the basic anatomy of the brain and spinal cord including: Blood supply of the brain and spinal cord, anatomy of the visual pathway, connections of the cerebellum and extra- pyramidal system, relationship of the spinal cord segments, long tracts of the spinal cord, the brachial and lumber plexuses and cranial nerves.

B. Neurophysiology

Review in brief the Neurophysiological basis of : tone and disorders of tone and posture, bladder control, muscle contraction and movement and pain.

C. Clinical Features & Management

Briefly outline the clinical features and management of the following Neurological Disorders:

1. Congenital and childhood disorders

    a) Congenital childhood disorders
    b) Hydrocephalus
    c) Spine Bifida
    d) Arnold Chiari malformation, Dandy walker syndrome

2. Cerebrovascular accidents

   a) General classification, thrombotic, embolic, haemorrhagic and inflammatory strokes.

   b) Detailed rehabilitative programme.

3. Trauma – First aid and management of sequelae of head injury and spinal cord injury.

4. Diseases of the spinal cord

   a) Cranio-vertebral junction anomalies.
   b) Syringomyelia
   c) Spinal arachnoiditis
   d) T.B. Spine

5. Demyelinating diseases (Central and peripheral)

   a) Gullian – Barre Syndrome
   b) Acutre disseminated encephalomyelitis
   c) Transverse myelitis.
   d) Multiple sclerosis

6. Degenerative disorders.

   a) Parkinson's disease.
   b) Dementia

7. Infections

   a) Pyogenic Meningitis sequelae
   b) Tuberculosis infection of central nervous system.
   c) Poliomyelitis
   d) Brain abscess

8. Diseases of the muscle including Myopathies: Classification, signs, symtpoms

9. Peripheral nerve disorders

10. Epilepsy: Definition, classification and management

11. Myasthenia Gravis; Definition, course and management.

12. Intracranial tumers; Broad classification, signs and symptoms.

13. Motor neuron disease.

14. Herniation of Brain.

15. Clinical assessment of neurological functions:

a) Basic history to determine whether the brain, spinal cord of peripheral nerve is involved.
b) Assessment of higher mental function such as orientation, memory, attention, speech and language.
c) Assessment of cranial nerves.
d) Assessment of motor power.
e) Assessment of sensory function: touch, pain and position.
f) Assessment of tone-spasticity, rigidity and hypotonia.
g) Assessment of cerebellar function.
h) Assessment of higher cortical function-apraxia etc.
i) Assessment of gait abnormalities.

PRACTICAL:

1. Various techniques of Physiotherapy for the above mentioned conditions/diseases should be demonstrated and practiced by the students.

2. Assessment planning and management of Neurological conditions.

3. General viva.

4. Piratical record.

CLINICAL REHABILITATION-II

A. Prosthesis and Orthosis

1. Definition and Basic Principles
2. Designing and Construction of Upper & Lower extremity – Orthosis & Spinal Orthosis.
3. Prescription and design of footwear- & its modification
4. Wheel chairs.
5. Ambulatory aids & Assistive devices
6. Measurement and P.O.P. cast techniques
7. Low cost thermo- labile material for construction of Orthosis

B. Management studies:

1. Definition branches of management – Principles of health seen management.
2. General principles of management – Theories of management
3. Personal management Policies and procedures concepts and theories.
4. Financial issues including budget and income generation.
5. Principles of an organizational chart.
6. Organization of a department planning, space, manpower, materials, basic requirements.
7. Resources and quality management – planning with change coping with change.
8. Self- Management.
   (1) Preparing for job
   (2) Time management
   (3) Career development

C. Professional Management and Ethics:

1. The implications of and confirmation to the rules of professional conduct.

2. Legal responsibility for their actions in the professional context and understanding liability and obligations in case of medico-legal action.

3. A wider knowledge of ethics relating to current social and medical policy in the provision of health care.

4. National and international professional bodies as a professional association and education body- Difference between scientific association (Professional body) and statutory body.

5. The role of international health agencies such as WHO.

D. Prosthesis and Orthosis:

1. Upper limb amputee rehabilitation & Prosthetic training.

2. Lower limb amputee rehabilitation & prosthetic training.

3. Foot wear modification in various conditions.

4. Wheel Chairs & seating system.

5. Ambulatory Aids & Assistive Devices.

6. Thermoplastic materials & Thermolabili materials .

7. Musculoskeletal problems of the upper limb.

8. Musculoskeletal problems of the lower limb.

9. Sports physiology, physiotherapy in sports and sports injuries.

10. Rehabilitation concerns in rehabilitation.

11. Neurorehabilitation.

12. Surgical rehabilitation.

13. Rheumatology & Rehabilitation.

Practical:

A. Practical demonstration of difficulties Orthotics/ Prosthetics.

B. Practical demonstration of different types of Orthoses/ Prostheses / Mobility aids / Assistive.

C. Demonstration of disability evaluation procedure.

D. General viva.