

LOK JAGRUTI KENDRA UNIVERSITY

Established by Gujarat act no.19 of 2019

Website- www.ljku.edu.in



CURRICULUM

BACHELOR OF PHYSIOTHERAPY

(BPT)

w.e. f Year-2023-24

Introduction:

PREAMBLE:

Physiotherapy is a health care profession concerned with human function and movement and maximizing physical potential. It is concerned with identifying and maximizing quality of life and movement potential within the spheres of promotion, prevention, treatment/intervention, habitation and rehabilitation. It uses physical approaches to promote, maintain and restore physical, psychological and social wellbeing, taking into account variations in health status. It is science based, committed to extending, applying, evaluating and reviewing the evidence that underpins and informs its practise and delivery.

The Bachelor of Physiotherapy (BPT) undergraduate degree is a 4 years and 6 months' full-time programme. Graduates with this degree can either pursue higher studies like Master of Physiotherapy and post graduate diploma or seek employment locally and internationally. Physiotherapists are employable in a wide range of areas like clinics, hospitals, hospices, homes for elderly, schools, industries, sports medicine centres etc. and can also choose private practice after they are awarded the Bachelor of Physiotherapy degree.

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

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

Able to provide patient education about various physiotherapeutic interventions to the patient and care givers

Expectations from the Future Physiotherapy Graduates:

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

Terminal Objectives (Expected Outcomes):

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

Program Outcomes

1. **Physiotherapy knowledge:**

Possess an understanding & knowledge of the scientific basis of Physiotherapy, principles of biological functions & analysis of scientific data & facts. Demonstrate an adequate understanding of the effects of disease on normal bodily functions & to apply this in the evaluation, management & rehabilitation of patients.

2. **Planning abilities:**

Demonstrate effective patient evaluation & treatment planning skills including time management & follow-up program

3. **Communication Skills:**

Demonstrate effective communication skills with patients, caregivers, other scientific/ medical personnel & community at large with regard to health promotion, education & rehabilitation

4. **Professional Identity & Ethics:**

Understand, analyze & communicate their professional role in the society (health promoters, rehabilitation specialists, health educators, employers, employee, managers). Demonstrate an understanding of human values & humanitarian approach in patient care. Apply ethical principles during day to day professional practice & take ownership of results/outcome of treatment

5. **Problem analysis:**

Utilize the principles of scientific enquiry, analytical thinking, clearly and critically, while solving problems and making decisions relating to patient care during daily practice. Find, analyze, evaluate and apply information systematically and make defensible decisions.

6. **Physiotherapist & Society:**

Apply informed contextual reasoning supported by evidence to assess societal, health, safety and legal issues and the consequent responsibilities relevant to professional Physiotherapy practice

7. **Leadership skills:**

Develop the ability to independently evaluate & plan patient care programs. Develop the ability to work as a team in the holistic management of patients. Demonstrate an

ability to lead & mentor a peer team or juniors in the best interest of the patient, profession & society at large.

8. **Research Acumen:**

Develop a keen sense of research in the field of Physiotherapy. Develop a sense of scientific inquiry in the evaluation & management of patients & aim to cover the lacuna in the knowledge pool by conducting good quality research & presenting the same at scientific forums & publish quality papers in order to aid evidence-based practice.

9. **Lifelong learning:**

Recognize the need for & engage in independent and life-long learning in the broadest context. Self -assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

L J UNIVERSITY
FACULTY OF HEALTH SCIENCES
L J INSTITUTE OF PHYSIOTHERAPY (LJIPT)
RULES AND REGULATIONS FOR THE DEGREE OF
BACHELOR OF PHYSIOTHERAPY PROGRAMME (B.P.T).

R.B.P.T-1. ELIGIBILITY FOR ADMISSION:

Eligibility of a candidate for admission to Bachelor of Physiotherapy programme will be according to the regulations for admission decided by Government of Gujarat from time to time.

R.B.P. T-2. DURATION OF THE COURSE:

The candidate for the degree of Bachelor of Physiotherapy programme shall be required to undergo a full-time training period of four academic years and six months of compulsory rotatory internship.

2.1.1 MEDIUM OF INSTRUCTION:

English shall be the medium of instruction for all the courses of study and for the Examinations.

R.B.P.T-3. ELIGIBILITY FOR UNIVERSITY EXAM:

ATTENDANCE:

A candidate is required to attend at least 75% of the total classes conducted in an academic year separately in theory, practical and clinical practice.

A candidate lacking in the prescribed attendance and progress in any subjects in theory or practical/clinical shall not be permitted to appear for the University Examination in those subjects.

R.B.P.T-4 RULES REGARDING EXAMINATION AND ASSESMENT:

SCHEME OF EXAMINATIONS:

4.1.1. The examination shall be open to a candidate who satisfies the requirement of attendance, progress and conduct as stipulated by the University.

4.1.2 Certificate to the above effect be procured from the Admin Department by the candidate along with the application for examination and the prescribed fee. Examination shall be held in the end of the Academic year.

4.1.3. There will be 2 internal Examinations and 1 Preliminary Examination before University Examination in each Academic year.

4.1.4. There will be University Examination through written paper and /or practical Examinations for 70% of the total marks of the subject at the end of every Academic year.

4.1.5. The internal marks are 30% of the total marks of theory and practical separately (For 100 marks of theory/practical -30 marks are allotted to internals. For 50 marks of theory - 10 marks are allotted to internals.)

4.1.6 The Supplementary Examination will be conducted for the failed students after 3 months and before 6 months by the University.

4.1.7 Distribution of Internal Marks shall be as under

For subjects (Theory/Practical) in which internal marks are 30 the distribution is as under,

7 Marks from I Internal Exam

7 Marks from II Internal Exam.

7 Marks from Preliminary Exam.

9 Marks from Assignment & Attendance.

R.B.P.T-5 CRITERIA FOR PASSING UNIVERSITY EXAMINATION:

To pass the University Examination:

1. A candidate must pass in two heads of passing i.e. theory and practical separately at the same time.
2. In the theory exam, the candidate must obtain 50 % of the total marks to pass theory exam irrespective of the internal marks.

3. In practical exam, the candidate must obtain 50% of total marks to pass practical exam irrespective of the internal marks.
4. A candidate must obtain 50 % marks in internal to pass in the respective course [subject].

R.B.P.T-6 RULES FOR ATKT:

6.1.1 Passing in First Year B.P.T Examination is not mandatory before proceeding to second year B.P.T training. However, passing in First Year B.P.T. Examination is mandatory for being eligible for second year B.P.T. Examination.

6.1.2 Passing for 2nd year B. Physiotherapy Examination is not mandatory before entering for 3rd B. Physiotherapy training. (Students can be allowed to attend classes in 3rd B.P.T only if he/she passed 1st B.P.T University Examinations) However, passing in 2nd year B. Physiotherapy is mandatory for being eligible to 3rd year B. Physiotherapy Examination.

6.1.3 Passing in 3rd year B. Physiotherapy Examination is not mandatory before entering for 4th year B. Physiotherapy training. (Students can be allowed to attend classes in 4th year B.P.T only if he/she passed 2nd B.P.T University Examinations) However, passing in 3rd year B. Physiotherapy is mandatory for being eligible to 4th year B. Physiotherapy Examination.

6.1.4 NUMBER OF ATTEMPT:

First attempt takes place when the candidate is due to appear as per the regulation of University for the Examination, similarly 2nd, 3rd, and 4th Examinations, there is no limit of number of attempts in any year to pass the Examination.

6.1.5 EXEMPTION FROM RE-EXAMINATION:

Candidates who have failed in the Examinations, but obtained pass marks in other subjects shall be exempted from re-examination in the subjects with pass marks. Candidates who have failed in theory & /or practical in any subject will have to appear in theory and practical both again for the particular subject.

6.1.6 GRADING:

The total of the internal evaluation marks and the final University Examination marks in each course will be converted to a letter grade on to conform as per the following scheme.

LETTER GRADES AND GRADE POINTS:

LETTER GRADES	GRADE POINTS	% OF MARKS
O (Outstanding)	10	80 and above
A+(Excellent)	9	75-79
A (Very Good)	8	70-74
B+(Good)	7	65-69
B (Above Average)	6	60-64
C (Average)	5	55-59
P (Pass)	4	50-54
F (Fail)	0	<50
Ab (Absent)	0	0

A student obtaining Grade (F) (or) Grade point '0' shall be considered fail and will be required to reappear in the Examination.

6.1.7 COMPUTATION OF GPA AND CGPA:

The students' performance in the examinations will be assessed by Grade point average (GPA) and cumulative Grade point average (CGPA).

The SGPA and CGPA are defined as follows:

(i) $SGPA = \sum C_i G_i / \sum C_i$ where C_i is the number of credits of course i G_i is the Grade Point for the course i and $i = 1$ to n , $n =$ number of courses in the semester

(ii) $CGPA = \sum C_i G_i / \sum C_i$ where C_i is the number of credits of course i

G_i is the Grade Point for the course i

and $i = 1$ to n , $n =$ number of courses of all semesters up to which CGPA is computed.

(iii) No student will be allowed to move further if CGPA is less than 3 at the end of every academic year.

In addition to above, the student has to complete the required formalities as per the regulatory bodies.

R.B.P.T-7 INTERNSHIP CRITERIA:

There shall be six months (26 weeks) of Internship after the final year Examination for candidates declared to have passed the Examination in all the subjects. Internship should be done in any Hospital recognized by the GSCPT. No candidate shall be awarded degree certificate without successfully completing six months of Internship.

The Internship should be rotatory and cover clinical branches concerned with Physiotherapy such as Orthopaedics, Cardiothoracic including ICU, Neurology, Paediatrics, General Medicine, General Surgery, Obstetrics and Gynaecology both in-patient and outpatient services. On completion of all postings, the duly completed logbooks will be submitted to the Principal to be considered as having successfully completed the internship program. The student has to do the Project in the internship as a part of the curriculum of B.P.T programme and submit it for the fulfilment of the Degree.

R.B.P.T-8 AWARD OF DEGREE:

8.1 Every student of the programme who fulfils the following criteria will be eligible for the award of the degree provided.

8.1.1 He/she should have earned at least minimum required credits as prescribed in the course structure.

8.1.2 He/she should have cleared all internal and external evaluation components in every course.

8.1.3 He/she should have completed the internship with Dissertation.

8.1.4 He/she should have secured a minimum CGPA 4.00 at the end of the B.P. T programme.

R.B.P.T-9 AWARD OF CLASS:

The class awarded to a student in the program is decided by the final CGPA as per the following scheme,

Distinction: CGPA > 7.5

First class: CGPA > 6.0

Second class: CGPA > 5.0

Pass class: CGPA - 4 .0

R.B.P.T-10 DRESS CODE:

Professionalism with respect to dressing is encouraged throughout the course. It is each Student's responsibility to have appropriate dressing during all class assignments and learning activities. Students are supposed to wear apron compulsorily during Practical and Clinical hours.

R.B.P.T-11 TRANSCRIPT:

The Transcript issued to the student at the time of leaving the University will contain a consolidated record of all the courses taken and credits earned, grades obtained, GPA, CGPA, class obtained etc.

FIRST YEAR					
COURSE CODE	COURSE TITLE	TEACHING SCHEME			
		Contact hours			
		Theory	Practical	Total	Credits
PT0101	HUMAN ANATOMY	160	120	280	11
PT0102	HUMAN PHYSIOLOGY	120	120	240	9
PT0103	BIOCHEMISTRY	60	—	60	3
PT0104	PSYCHOLOGY AND SOCIOLOGY	80 +80	—	160	8
PT0105	ELECTROTHERAPY I	120	80	200	8
PT0106	EXERCISE THERAPY I	120	160	280	10
PT0107	COMPUTER APPLICATION *	40	40	80	3
PT0108	ENGLISH *	40	40	80	3
	TOTAL HOURS				
	GRAND TOTAL			1440	55
	* Computer Application & English are not for University Examination				

FIRST YEAR EXAMINATION SCHEME

		FIRST YEAR					
		EXAMINATION					
		SCHEME					
Course Code	Course Title	Theory		Practical		Total	
		Internal	External	Internal	External		
PT0101	Human Anatomy	30	70	30	70	200	
PT0102	Human Physiology	30	70	30	70	200	
PT0103	Biochemistry	10	40			50	
PT0104	Psychology and Sociology	15+15	35+35			100	
PT0105	Electrotherapy-I	30	70	10	40	150	
PT0106	Exercise Therapy I	30	70	30	70	200	

HUMAN ANATOMY

Teaching Hours: 280 hours (Theory: 160 hours and Practical: 120 hours).

Maximum Marks: 200 (Theory: 100 and Practical and viva-voce: 100).

Assessment: Written, Oral and Practical, Internal and University examinations.

Internal Examination: 30 marks Theory and 30 marks Practical.

University Examination: 70 marks Theory, 70 marks Practical and Viva – voce.

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.

A. GENERAL ANATOMY -

- 1 Define anatomy, subdivisions
- 2 Define anatomical position, anatomical terms, and Axes planes.
- 3 Cell – Define, parts of cell, function
- 4 Tissue – Define, classify
- 5 Bone – Define, classification with examples, microscopic anatomy of bone, blood supply
- 6 Joint – Define, classification with examples, feature of synovial joint: articulating surface Stability, mobility, nerve supply
- 7 Muscle – Define, classify with examples, structure of skeletal muscle: myofibrils, Contraction
- 8 Define origin, insertion, muscle work, types of muscle work, group action- agonist, Antagonist, synergist, fixator, shunt and spurt muscle, levers with e.g.
- 9 Nerve – Structure, parts, synapse, neuron, classification

B.HISTOLOGY (NOT FOR UNIVERSITY EXAMINATION)

- 2.1 Cell
- 2.2 Tissues of the body
- 2.3 Epithelium
- 2.4 Connective tissue
- 2.5 Cartilage
- 2.6 Bone
- 2.7 Lymphoid tissue

EMBRYOLOGY. (NOT FOR UNIVERSITY EXAMINATION)

- 3.1 Ovum, spermatozoa, fertilization and formation of germ layers and their derivations
- 3.2 Development of skin, fascia, blood vessels and lymphatics
- 3.3 Neural tube, brain vessels, spinal cord
- 3.4 Development of brain and brainstem structures, developmental anomalies (brief)
- 3.5 Development of bones, axial and appendicular skeleton and muscles.

B. UPPER LIMB

1 OSTEOLOGY

Identify parts, borders, surfaces, attachments of bones— clavicle, scapula, humerus, radius, ulna, carpal bones, Meta carpal, phalanges.

2 ARTHROLOGY

Type, articular surface, muscle, ligaments, movements blood supply, nerve supply of joints-Sterno clavicular, acromio clavicular, shoulder, elbow, radio ulnar, Wrist Joint, IP, MCP, CMC.

3 MYOLOGY

Identify muscles – origin, insertion, nerve supply, action of muscles of Scapula, Pectoral region, upper arm, Forearm & Hand.

4 NEUROLOGY

Identify nerves of upper limb and its origin, course, division, innervations, Relation, its applied anatomy of radial nerve, median nerve, ulnar nerve, Axillary nerve, musculocutaneous nerve. Brachial plexus – formation and root values. Dermatome of UL.

5 ANGIOLOGY

Distribution of blood vessels, lymph nodes, main arteries and veins of UL - Axillary, brachial, radial, ulnar arteries, Axillary, Brachial and subclavian vein.

6 SOFT PARTS

AXILLA -Identify boundaries, contents of axilla, branches of axillary artery and its relation.

Scapulo Humeral rhythm

Cubital fossa – Boundaries, contents, relation

C.LOWER LIMB

1 OSTEOLOGY

Identify parts, border, surface, attachments of bones – hip bone, femur, tibia, Fibula, patella, tarsal bones, Meta tarsal bones, phalanges

2 ARTHROLOGY

Type, articular surface, muscle, ligaments, movements, blood supply, nerve supply, of joints – hip, knee, tibio fibular, Ankle joint, Joints of Foot .

3 MYOLOGY

Identify origin, insertion, and nerve supply, action of muscles of – Gluteal region, thigh, leg, and sole of Foot.

4 NEUROLOGY

Identify plexuses, nerves of LL, origin, course, innervations, and applied anatomy, Relation of femoral nerve, sciatic nerve, tibial nerve, common peroneal nerve, Obturator nerve, superficial and deep peroneal nerve. Lumbar plexuses sacral plexuses.

5 ANGIOLOGY

Distribution of blood vessels, lymph node of LL, main arteries and veins of LL – Femoral artery, femoral vein, tibial artery, posterior tibial artery, great saphenous vein and small saphenous vein.

6 FEMORAL TRIANGLE

7 Popliteal fossa – boundaries and contents.

8 Arches of foot.

D.THORAX AND ABDOMEN

1 Osteology of vertebral column

2 Identify and classify vertebrae – typical & atypical

3 Parts and features of typical vertebrae.

4 Features of thoracic, lumbar, sacral, coccyx.

5 Intervertebral joint – articulating surface, movements, stability, mobility

6 Curvatures of vertebral column.

7 Contents of vertebral canal.

- 8 Sternum – parts, features (borders, surfaces, muscle attachments)
- 9 Define true, false, floating ribs
- 10 Mention parts and features of atypical rib.
- 11 Type and formation of joint between rib and vertebrae, between costal cartilage, costal cartilage and sternum, between parts of sternum.
- 12 Sternal angle.
- 13 Intercostals space and its contents.
- 14 Intercostals nerve – course and its branches.
- 15 Intercostals muscle – origin, insertion, nerve supply, action.
- 16 Diaphragm – origin, insertion, nerve supply, action, orifice, structures passing through Diaphragm.
- 17 Movements of ribs – pump handle and bucket handle movement
- 18 Normal position, external features of heart and parts of heart, internal features of Chambers of heart, blood supply, venous supply, conductive system Normal position, parts, relation, blood supply of URT & LRT, pleura and its reflection, nerve supply, Broncho pulmonary segment, mechanics of respiration

E. HEAD AND NECK

- 1 Skull (features, joints of skull bone, parts)
- 2 Identify internal and external auditory meatus, foramen magnum, stylomastoid foramen and structures passing through them
- 3 Anterior and posterior triangles of neck (boundaries and contents)
- 4 Muscles of the face (origin, insertion, action, nerve supply, applied anatomy)
- 5 Cranial nerve (origin, course, relation, innervations)
- 6 Trigeminal nerve (origin, course, relation, innervations)
- 7 General features of typical cervical vertebrae, atlas, axis, seventh cervical vertebrae.
- 8 Cervical plexus (formation, distribution, root values)
9. Sternomastoid, erector spinae, scalene
10. Atlantoaxial joint (articular surface, muscles, movements, ligaments, blood supply, NS)
11. Atlantooccipital joint (articular surface, muscles, movements, ligaments, blood supply, NS).

12. Position and extent of subclavian, vertebral, carotid arteries
13. Components of circle of Willis and its supply, applied importance
14. Internal jugular and subclavian vein (position, formation, and termination)
15. ANS
16. Parts of brain and its function, applied importance, cerebellum, Thalamus, Hypothalamus, Corpus striatum, Cerebral hemispheres – white and gray matter, lateral ventricles, blood supply of brain, meninges, pyramidal system, extrapyramidal systems, anatomic integration.
17. Eye (parts, retina, optic pathway, nerve supply, muscles of eye)
18. Nose (parts, boundaries of nose, nasal cavity, sinuses)
19. Temporomandibular joint (type, articular surfaces, ligaments, movements, muscle responsible, and nerve supply)
20. Ear (parts, organ of Corti, nerve of hearing and its applied importance)
21. Oral Cavity.
22. Muscles of Mastication.
23. Cerebro-spinal fluid.
24. Autonomic nervous system-sympathetic, parasympathetic.

F. PELVIS

1. Formation and subdivision of bony pelvis
2. List features of male and female bony pelvis
3. Type, articular surface, ligaments, movements of joints of pelvis
4. Abdominal cavity and layers of abdominal wall (ant & post), (O, I, NS, ACT)
5. Rectus sheaths
6. Inguinal canals (position, extent, formation, content)
7. Branches and distribution of abdominal aorta and iliac arteries
8. Mention features of pubic symphysis and Sacro iliac joint
9. Muscles of pelvic floor (attachment, action, nerve supply)
10. Structures of urogenital diaphragm.

11 Position, extent, parts, relation, blood supply, nerve supply, lymph drainage of kidney, ureter, urinary bladder, urethra.

12 Innervations of urinary bladder.

Practical Contents.

1. Topics for dissection

- Upper extremity, thorax.
- Surface anatomy of all the above
- Lower extremity.
- Surface anatomy of all the above.

2. Practical demonstrations

- identifying the bone, cartilage, all connective tissues, blood vessels,
- Embryology- models, charts & x-rays
- Histology- identifying the bone, cartilage, all connective tissues, blood vessels, nervous system cells
- Embryology- models, charts & x-rays .

3. Demonstrations (in a cadaver)

- Organs in thorax and abdomen.
 - Upper Limb joints with periarticular structures.

 - Points of palpation of peripheral nerves and blood vessels of upper limbs.
 - Organs in thorax.
 - Lower Limb joints with periarticular structures.

 - Points of palpation of peripheral nerves and blood vessels of lower limbs
 - Brain parts and spinal cord
 - All muscles of the whole body.
1. **Identification of body prominences on inspection and by palpation of Upper extremities.**
 2. **Identification of body prominences on inspection and by palpation of Lower extremities.**

RECOMMENDED STUDY MATERIALS:

TEXTBOOKS:

1. Human Anatomy by B.D. Chaurasia¹, Vol.1, 2, 3, Latest edition; CBS publications.
2. Textbook of Anatomy by Inderbir Singh; Latest edition; Jaypee Publications.
3. Handbook of Osteology by Poddar; Latest edition; Scientific Book Company.

REFERENCE BOOKS:

1. Principles of anatomy and physiology by Tortora; Latest edition; Harper & Row Publications.
2. Cunningham's Manual of Practical Anatomy; Latest edition, Vol: 1, 2, 3; Oxford Publications.
3. Clinical Anatomy for Medical Students by Richard Snell, Latest edition, Lippincott, Williams & Wilkins.
4. Anatomy & Physiology by Ross & Wilson's, Latest edition, Churchill Livingstone.
5. Gary's Anatomy, Latest edition, Elsevier Publications.
6. Grant's atlas of anatomy, Anne MR; Latest edition.

HUMAN PHYSIOLOGY

Teaching Hours: 240 hours (Theory: 140 hours and Practical: 100 hours).

Maximum Marks: 200 (Theory: 100 and Practical and viva-voce: 100).

Assessment: Written, Oral and Practical, Internal and University examinations.

Internal Examination: 30 marks Theory and 30 marks Practical.

University Examination: 70 marks Theory, 70 marks Practical and Viva – voce.

Objectives:

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

- 1) Describe Cell structure and function.
- 2) Acquire the knowledge of functions of various systems of human body.
- 3) Understand the role of hormones, enzymes and other different types of cells of Human body.
- 4) Explain the structure and functions of the muscles.

1. GENERAL PHYSIOLOGY:

A. CELL

1. Basic concepts of cell structure, components, functions, transport

B. SKIN

1. Structure, functions, temperature regulation.

2. BLOOD:

1. Composition and function of blood
2. RBC-morphology, formation, normal count, functions, physiological & pathological Variation
3. WBC- morphology, formation, normal count, functions, physiological & pathological Variation
4. Blood Platelets-Morphology, normal count, formation, function, variation
5. Haemoglobin-Basic chemistry, function, fate of haemoglobin
6. Blood Clotting-Definition, clotting factor, theories of clotting.
7. Blood group-ABO system, Rh System
8. Blood volume and regulation
9. Blood transfusion

3. CARDIOVASCULAR SYSTEM:

- 1 Structure and properties of cardiac muscle
- 2 Cardiac cycle, Conductive system, ECG
- 3 Heart sounds
- 4 Heart rate and regulation
- 5 Cardiac output and regulation
- 6 Blood pressure and regulation
- 7 Regional circulation- coronary, pulmonary, renal, cerebral
- 8 Effect of exercise in CVS system

4. RESPIRATORY SYSTEM:

- 1 Structure and function of respiratory system
- 2 Mechanics of respiration – Muscles of respiration, Lung & Chest wall compliance, V/Q Ratio, Surfactant
- 3 Transport of gases- O₂ & CO₂
- 4 Nervous and Chemical regulation of respiration
- 5 Hypoxia, Cyanosis, Dyspnoea.

6 Acid Base Balance

7 Principles of Lung Function Test – Spiro meter, Lung volumes and capacities

8 Artificial respiration

9 Effect of exercise on respiratory system

10. Defense mechanism

5. DIGESTIVE SYSTEM:

1 Structure and function of GI system.

2 Mastication and Deglutition.

3 Saliva – composition, function, regulation

4 Gastric secretion – composition, phases of secretion, function

5 Pancreatic secretion – composition, function, regulation

6 Bile – composition and function

7 Movements of small and large intestine

8 Digestion in mouth, stomach, intestine

9 Defecation

7. ENDOCRINES:

1. General organization of endocrine glands

2. General metabolism – Carbohydrate, Fat, Protein

3. Physiological action, regulation, disorder of hormones – Adrenal, Pancreatic, Parathyroid, Thyroid.

8. REPRODUCTIVE SYSTEM:

1 Male reproductive system

2 Female reproductive system

3 Pregnancy, function of placenta, parturition, lactation, contraception

4 Puberty and Menopause

5 Spermatogenesis and Oogenesis

6 Menstrual cycle.

9. EXCRETORY SYSTEM:

- 1 Structure and function of kidney
- 2 Structure and function of nephron
- 3 Formation of urine – Filtration, Reabsorption, Secretion
- 4 Micturition.

NEURO MUSCULAR PHYSIOLOGY:

11. MUSCLE:

- 1 Structure of muscle – Macroscopic & Microscopic (Myofibril, Myoneural junct)
- 2 Properties of skeletal muscle
- 3 Cardiac and smooth muscle
- 4 Chemical process involved in muscle contraction
- 5 Motor unit, EMG
- 6 Effect of exercise on muscular system
7. Exercise metabolism – O₂ dept, respiratory quotient

12. NERVOUS SYSTEM:

1. General organization of nervous system
- 2 Structure, type and function of neuron
- 3 Properties of neurons
4. Synapse and synaptic transmission
- 5 Neurotransmitters
- 6 Reflex – Properties and types
- 7 Sensory – Receptors, sensory pathway, pain pathway, referred pain, modulation of pain
8. Motor – Basal ganglia, Cerebellum, Cortex –Function & Effect of lesion
9. Ascending and Descending pathways
10. Posture and Equilibrium.

11. Muscle tone
12. ANS – organization, function of SNS & PSNS
- 13 .CSF – composition, formation, circulation, function
14. LMN & UMN lesions

13. SPECIAL SENSES:

- 1 Vision – rods and cones, retina and its function, visual pathway.
- 2 Hearing – organ of corti, auditory pathway.
- 3 Olfaction.
- 4 Taste – taste buds.

PRACTICAL AND DEMONSTRATIONS.

1. Respiratory System:

1. Artificial respiration.
2. Pulmonary function Test-Spirometry.
3. Clinical Examination of Lungs.

2. Cardiovascular System:

1. Heart Sounds
2. Recording of Blood pressure, Effect of posture & exercise on BP.
3. Cardiac efficiency tests.
4. Recording and study of E.C.G.
5. Clinical examination of Radial Pulse.

3. Central Nervous System:

1. Examination of Sensory Functions.
2. Examination of Motor Functions.
3. Examination of reflexes.

4. Examination of cranial nerves.

RECOMMENDED STUDY MATERIALS:

TEXTBOOKS:

1. Concise Medical Physiology by Chaudhary, New Central Book Agency.
2. Human Physiology, Chatterjee. Vol: 1&2: Medical & Allied Agency.
3. Human Physiology, Sembulingam: Jaypee Brothers.
4. Practical Physiology by Vijay Joshi: Vora Medical Publication

REFERENCE BOOKS:

1. A Textbook of Practical Physiology, Ghai CL, Jaypee Brothers.
2. Textbook of Medical Physiology by Guyton & Hall, Elsevier Publication.
3. Principles of Anatomy & Physiology, Tortora, Harper & Row Publication.

Teaching Hours: 60 hours (Theory: 60 hours)

Maximum Marks: 50 (Theory: 50)

Assessment: Written, Internal and University examinations

Internal Examination: 10 marks Theory

University Examination: 40 marks Theory

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. 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.

1. Cell Biology

- 1.1. Introduction, Cell structure, Cell membrane structure and function, various types of absorption.
- 1.2. Intracellular organelles and their functions

2. Carbohydrates

- 2.1. Carbohydrates: Definition, Classification
- 2.2 . Physiologically important mono, di and polysaccharides- Glycogen, starch, cellulose
- 2.3. Mucopolysaccharides – hyaluronic acid, chondroitin sulphate, heparin.

2.4. Digestion and absorptions of carbohydrates.

2.5. Glycolysis (aerobic, anaerobic, energetic regulation, Cori's cycle) Glycogenesis and Glycogenolysis (their regulation, role of liver and muscle glycogen), Gluconeogenesis, Citric acid cycle with its energetics.

2.6. Hormonal regulation of blood sugar level

3 **Proteins**

3.1 Amino Acids Classification based on structure and nutritional importance, isoelectric pH, physiologically active peptides

3.2 Proteins - Definition, Functions, Classification and Structure, Denaturation Plasma Proteins and their separation by electrophoresis, Digestion and absorption of proteins, Urea Cycle.

4 **Lipids**

4.1. Definition, classifications of lipids and fatty acids, examples and functions of common lipids,

4.2 Essential fatty acids and their importance, Lipoproteins: classification, sources, functions, Digestion and absorption of lipids.

4.3 B-oxidation and its energetics with regulation, Cholesterol and its importance.

ketone body formation and utilization (outline of pathways)

5 **Vitamins**

5.1 Definition, Classification, Chemistry, Sources, Requirement, Functions and Deficiency manifestations of vitamins: A, D, E, K, C, Thiamin, Riboflavin, Niacin, Pyridoxine, Folic Acid, Cyanocobalamin.

6 **Minerals**

6.1 Individual minerals: calcium, phosphate, iron, magnesium, fluoride

6.2 Digestion, absorption, transport, excretion, functions, Disorders

7. **Connective Tissue**

7.1. Biochemistry of connective tissue – Collagen.

8. **Enzymes**

8.1. Definition, classification, factors

8.2. Coenzymes.

8.3 Inhibition and type of inhibitors

8.4. Isoenzymes

8.5. Clinical and therapeutic uses of enzymes.

8.6. Factors affecting enzyme activity.

9. Nutrition

9.1. Importance of nutrition, nutritional aspects of Carbohydrates. Proteins, Fats and Fibres, Classification of fibres, calorimetry, energy values, respiratory quotient S, D, A.

9.2. BMR, PEM, Balanced diet.

10. Nucleic Acids

10.1. D.N.A. /R.N.A.-Definition, structure and function, types, Genetic code.

11. Acid Base Balance, Water & Electrolyte

11.1. Body water, PH, osmolality Extra and Intra cellular fluid

11.2. Buffers, PH, buffer system in blood

11.3. Role of kidneys & lungs in acid-base balance.

11.4 Water electrolyte balance, imbalance, and dehydration.

12. Applied Biochemistry:

12.1. Lactose intolerance, diabetes mellitus, diabetic keto-acidosis, hypoglycaemia.

12.2. PEM, kwashiorkor, marasmus, common protein deficiency disorders

12.3. Ketosis, Atherosclerosis.

12.4. Jaundice.

12.5. Gout.

12.6. Acidosis & Alkalosis.

RECOMMENDED STUDY MATERIAL:

TEXT BOOKS:

1. Essentials of Bio-chemistry by U. Satya Narayan, Latest Edition, Books and Allied Publications.
2. Medical Biochemistry for Physiotherapy students by Harpreet Kaur, Jag Mohan Singh, Latest edition, Jaypee Publications.

REFERENCE BOOKS:

1. Text book of Medical Bio-Chemistry – Dr..M.N.Chetterjee, Latest Edition, Jaypee Publication.
2. Fundamental of Bio-Chemistry – Dr. A.C. Deb, Latest Edition, Central Publication.
3. Bio-Chemistry introduction – Mekee, Latest Edition, Mac GrawHill Publication.

PSYCHOLOGY

Teaching Hours: 80 hours.

Maximum Marks: 50 (Theory: 50 marks)

Assessment: Written, Internal and University examinations

Internal Examination: 15 marks Theory

University Examination: 35 marks Theory

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 behaviour.

Section – I - General Psychology

1. Introduction to Psychology

Definition and nature of Psychology, Fields & subfields of psychology

Schools of thoughts- Structuralism, functionalism, Behaviourism, Gestalt, Psycho-analytic Theory.

2. Developmental Psychology

Definition & its Theories

Physiological & Psychological changes during Infancy, Early & Late childhood,

Adolescent stage, Puberty, Adulthood & old age

3. Emotions- nature & relationship with autonomic nervous system

Theories of emotions - James Lange theory, Schachter Singer theory, Cannon Bard theory

4. Motivation- Maslow's hierarchy of motives, Theories of motivation

Conflict & Frustration – Types of conflicts, Common Defense mechanism, stress

5. Learning - Definition and theories, conditioning, Role of learning in human life

6. Attention & perception- Nature of attention & perception, Principle of grouping.

7. Memory- Definition and nature, types of memory and forgetting cause Learning.

8. Abnormal Psychology - Difference between normal & Abnormal, Causes of abnormality

Section – II-Health Psychology

1. Psychological Reactions of a Patient:

during admission and treatment anxiety, shock, denial, suspicion, questioning, loneliness, regression, shame, guilt, rejection, fear, withdrawal, depression, egocentricity, concern about small matters, narrowed interests, emotional overreactions, perpetual changes, confusion, disorientation, hallucinations, delusions, illusions, anger, hostility, loss of hope

2. Reactions to Loss:

Death and bereavement shock and disbelief, development of awareness, restitution, resolution, stages of acceptance as proposed by Kubler – Ross

3. Stress: Physiological and Psychological relation to health and sickness, Psychosomatic, Professional stress burnout.

4. Behavior Modifications: Application of various conditioning and learning principles to modify patient behaviours.

5. Personality Styles: Different Personality styles of patients.

6. Compliance: Nature, factors contributing to non-compliance, improving compliance.

SOCIOLOGY

Teaching Hours: 80 hours.

Maximum Marks: 50 (Theory: 50)

Assessment: Written, Internal and University examinations

Internal Examination: 15 marks Theory

University Examination: 35 marks Theory

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.

1. Introduction – Definition & Relevance with Physiotherapy. Methods of Sociology – case study, social survey, questioner interview and opinion poll methods.

Importance of its study with special reference to health care professionals.

2. Sociology & Health –Social factors affecting Health Status, Social Consciousness & Perception of Illness, Decision Making in taking Treatment

3. Socialization – Definition, Influence, of Social Factors, on Personality, Socialization in the Hospital &Rehabilitation of the patients.

4. Social Groups-Concepts, Influence of formal & informal groups of Health & Diseases.

4.1 Community Role- in Rural & Urban communities in Public Health, in determining Beliefs, Practices & Home Remedies in Treatment.

4.2 Social problems of the Disabled-Consequences of the following social problems in relation to sickness disability, remedies to prevent these problems

* Population Explosion

* Poverty & Unemployment

4.3 Social Security & Social Legislation in relation to the Disabled.

5. Role of Primary & Secondary Groups in the Hospital & Rehabilitation Setting.

6. **Family**-Influence on human personality, Individual Health, Family &

7. Nutrition, Effects of Sickness on Family Psychosomatic Diseases &Family

8. **Culture**-Components Impact on Human Behaviour Cultural Meaning of Sickness, Response to Sickness & Choice of Treatment .

9. **Caste Systems**-Features of Modern Cast Systems & its Trends, Social change factors–Human Adaptation, Stress, Deviance, Health Program, Role of Social Planning in the improvement of Health & in Rehabilitation
10. **Social Control** – Definition, Role of norms, Folkways, Customs, Morals,
11. Religion, Law & other means of social controls in the regulation of Human Behaviour, Social Deviance & Disease
12. Prostitution, Alcoholism, Beggary, Problems of Women in Employment, Role of a Social Worker.
13. Role of Culture as Social consciousness in moulding the Perception of Reality, Culture induced Symptoms & Diseases, Sub-Culture of Medical Workers
14. **Social problems of the Disabled**-Consequences of the following social problems in relation to sickness disability, remedies to prevent these problems – Juvenile delinquency.
15. **Social Worker**: Meaning of Social work, role of a medical social worker.

RECOMMENDED STUDY MATERIAL:

TEXTBOOKS:

1. Introduction to psychology by S.K.Mangal, Sterling Publishers
2. Introduction to psychology by – Morgan and King, 7th Edition, Tata McGraw-Hill Edition.
3. Sociology for Physiotherapists by Dibyendunarayana Bid, 1st edition, Jaypee Publication.
4. Introduction to Psychology by Morgan C.T. & King R. A.
5. Textbook of Preventive & Social Medicine – P. K. Mahajan & M. C. Gupta .

REFERENCE BOOKS:

1. Psychology: The Study of Human Behaviour, Mishra B.K, PHI Learning.
2. Essentials of Educational Psychology, Skinner Charles E, Surjeet Publication.
3. Abnormal Psychology, Page James D, Surjeet Publication.
4. An introduction to sociology by - Sachdeva and Bhushan, 32nd Edition, Kitab Mahal Publication.
5. Textbook of Sociology for Physiotherapy Students by KP Neeraja, 1st Edition, Jaypee Publication.
6. Indrani T K, Text Books of Sociology for Graduates Nurses and Physiotherapy students, JP Brothers.

ELECTROTHERAPY I

Teaching Hours: 200 hours (Theory: 120 hours and Practical: 80 hours)

Maximum Marks: 150 (Theory: 100 and Practical: 50)

Assessment: Written, Oral and Practical, Internal and University examination.

Internal Examination: 10 marks Theory and 10 marks Practical

University Examination: 40 marks Theory, 40 marks Practical and viva – voce.

OBJECTIVES:

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

1. Understand the basic concept of Medical electronics and its relation to the human body.
2. Understand the various Principles & laws governing the working of Electrotherapeutic Modalities and Physical agents & their effect on various body systems
3. Understand the indications, contraindications and precautions to be taken during application of Electrotherapeutic modalities and Physical agents in the treatment of common conditions.
4. Demonstrate the Methodology of application of physical agents and electro-therapeutic modalities.

Syllabus:

BIOELECTRONICS

- Conductors, Insulators, Potential difference, Resistance & Intensity
Ohm's Law – Its application to AC & DC currents.
- Rectifying Devices – Thermionic Valves, Semiconductors, Transistors
- Amplifiers, Transducers, Oscillator circuits
- Capacitance, condensers in DC and AC Circuits
Display devices & indicators – analogue & digital.
- Chemical effects - ions and electrolytes, ionization, Production of a E.M.F. by chemical actions
- Magnetic effects, Molecular theory of Magnetism, Magnetic fields, Electromagnetic Induction, Eddy currents,
- Milli-ammeter and Voltmeter, Transformers
- Thermal Effects – Joule's Law and Heat production.
- Electromagnetic spectrum – biophysical application

- Physical Principles of sound and its properties
Physical Principles of light and its properties

ELECTRIC SUPPLY

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

THERMO THERAPY

1. Physiological responses to heat gain/ loss on various tissues of body
2. Therapeutic effects of heat and cold
3. Home remedies of heat and cold.
4. Transmission of heat

1. SUPERFICIAL HEAT MODALITIES

1.1. Paraffin Wax Therapy – Principles & composition of Wax Bath Therapy unit, various methods of application, Effects: physiological effects and therapeutic effects, indications and contraindications, dangers and precautions.

1.2 Moist Heat Therapy (Hydro Collator Packs) – Principles, methods of application, Effects: physiological effects and therapeutic effects, indications and contraindications, dangers and precautions.

1.3 Fluidotherapy – Principles, methods of application, Effects: physiological effects and therapeutic effects, indications and contraindications, dangers and precautions.

1.4 Whirl Pool Therapy:

Principles, methods of application, Effects: physiological effects and therapeutic effects, indications and contraindications, dangers and precautions.

1.5 Hubbard tank

Principles, methods of application, Effects: physiological effects and therapeutic effects, indications and contraindications, dangers and precautions.

2. CRYOTHERAPY

1. Definition

2. Biophysics

3. Indication & contraindication

4. Technique of application

A. Ice pack

B. Ice massage

C. Cold pack

D. Cold whirlpool

E. Cryo-cuff

F. Cold spray

G. Cryo stretch

H. Cryo kinetics

3. CONTRAST BATH

Principles, methods of application, Effects: physiological effects and therapeutic effects, indications and contraindications, Dangers and precautions.

A. RECOMMENDED STUDY MATERIAL:

TEXTBOOKS:

1. Clayton's Electrotherapy (Theory and Practice) – Clayton's Aibs publications.
2. Electrotherapy Explained – John Low and Reed 4th edition B & H publications.
3. Physical Agents in Rehabilitation: From Research to Practice by Cameron.

REFERENCE BOOKS:

1. Electrotherapy: Evidence based Practice by Kitchen Sheila, 11th Ed.
2. Basis of Electrotherapy- Subhash Khatri 1st edition. Jaypee brothers.
3. Practical in Electrotherapy by Joseph Kahn, Churchill Livingstone.

EXERCISE THERAPY-I

Teaching Hours: 280 hours (Theory: 120 hours and Practical: 160hours)

Maximum Marks: 200 (Theory: 100 and Practical: 100)

Assessment: Written, Oral and Practical, Internal and University examinations

Internal Examination: 30 marks Theory and 30 marks Practical

University Examination: 70 marks Theory, 70 marks Practical and viva – voce

Objectives:

1. To develop an understanding of theoretical knowledge and practical skills pertaining to various therapeutic movements used in the treatment of various diseases and disorders by physiotherapists.
2. Demonstrate starting positions and identify various derived positions, describe joint positions, muscle work and use of each position.
3. Describe types of Goniometer, merits and demerits of goniometry and demonstrate skills of measuring ROM with goniometer.
4. Demonstrate skill of various techniques of massage manipulations and describe the Physiological effects, therapeutic use, merits /demerits of the same.
5. Demonstrate group and recreational activities, group and individual general fitness exercises used in Physical Training.

General Mechanical Principles:

1. Anatomical movement

a. Flexion, Extension, Abduction, Adduction, Medial rotation, Lateral rotation, b. Circumduction, Inversion, Eversion, Dorsi flexion, plantar flexion, Protraction c. Retraction, Supination, Pronation, Elevation, Depression.

2. **Range of motion (ROM)**-Definition, Types-Active Rom, and Passive Rom

3. **Force**-Composition, Parallelogram of force

4. **Gravity**-Centre of gravity, Line of gravity

5. **Equilibrium**-Stable, Unstable, Neutral

6. **Pulley**-Fixed and Movable.

7. **Springs**-Series and Parallel.

8. **Levers**-I st order, II nd order, III rd. order, Examples, Application in PT

9. **Planes & Axis**-Sagittal, Frontal, Transverse, Vertical
10. Newton laws of motion .
11. Definition of speed, Velocity, Work, Energy, Power, Acceleration, Momentum
12. Friction, Inertia .

INTRODUCTION TO EXERCISE THERAPY

1. BASICS OF EXERCISE

1. Physiological effects and Therapeutic uses of Exercises.
2. Psychogenic aspects of Exercises.
3. Pharmacological effects of Exercises.

2. STARTING POSITION AND DERIVED POSITION

1. Starting position

Definition, Purpose, Positions-Standing, Sitting, Lying, Kneeling, Hanging

2. Derived position Definition, Purpose, Positions & Muscle Work.

Standing-High standing, Walk standing, Stride standing, Step standing Toe standing, half standing, Cross standing

Sitting-Crook sitting, Long sitting, Stoop sitting, Squatting, Side sitting

Lying-Prone lying, half lying, Crook lying, side lying

Kneeling-Half kneeling, kneel sitting, prone kneeling, inclined prone kneel

Hanging-Half hanging.

3. ACTIVE AND PASSIVE MOVEMENT

1. Introduction
2. Classification of movement-Active & Passive
3. Active Movement-Definition, Indication, Effect, Types- Free, Active assisted, assisted resisted, resisted exercise.
4. Passive Movement-Definition, Types- Relaxed passive movement-upper & lower extremity, Neck, Trunk, CPM, Passive manual mobilization-mobilization of joint, Manipulation of joint, Stretching of soft tissues

4. RELAXATION

1. Introduction
2. Indication
3. Relaxation Techniques-Local, General, Others
4. Local relaxation –
Therapist massage
Passive movement
Muscle energy techniques.

Hold relax Contract relax.

General relaxation-

Contrast method

Reciprocal inhibition .

5. GROUP EXERCISE

1. Introduction

2. Advantages & Disadvantages

3. Indication

4. Formation of group

Space

Selection of patients

Number of patients

Instruction to patients

Group type.

6. FREE EXERCISES

1. Classification, techniques, therapeutic effects of free exercises.

2. Application for shoulder, neck, hip and knee joints.

3. Techniques of application for shoulder, elbow, wrist, neck, hip, knee & ankle joints.

7. WALKING AIDS

1. Definition

2. Indication.

Types of walking aids

Crutches

Canes

Walkers

Wheel chair

4. Crutches

Types-Axillary, Elbow or Forearm, Gutter.

Parts of crutch-Axillary & Elbow Crutch muscles and preparatory exercise

5. Canes

Purpose

Types of cane-Standard cane, Standard adjustable canes, Tripod, Quadruped

Gait pattern-Three-point gait, two-point gait

5. Walkers

Purpose

Parts

Types-Rigid walking frame, Foldable walker, Rollator, Reciprocal walker, Gutter Walker

6. Wheel Chair

Introduction

Purpose

Parts of wheel chair

Wheels, tyres, wheel locks, casters, hand rim, foot rest, tilt bar, seat and back rest.

Measurement

Seat width, Seat height, Seat depth, Back rest height, Arm rest height.

Types of wheel chair

Rigid, Foldable, One arm driven wheel chair, Powered wheel chair.

8. Gait- Normal gait cycle – Phases of gait

Crutch walking - Types of crutch walking, Use of parallel bars in pre-crutch walking stage, balance exercises, phase of walking, gait training, group of muscles responsible during crutch walking.

Progression in crutch walking, measurement of crutches,

Gait pattern-Four-point gait, two-point gait, and three-point gait, PWB, NWB Swing to & Swing through, stair climbing.

Measurement for crutches-Axillary & Elbow.

9. Therapeutic Gymnasium

Use of various apparatus: Shoulder wheel, shoulder Ladder, shoulder pulleys, pronator /supinator board, Static cycle, treadmill, rowing machine, Tilt Table, Ankle exerciser and balancing board, springs, Different types of Weights, usage, other exercises therapy instruments.

10. GONIOMETRY

1. Definition

2. Normal range of motion of joints

3. Types of Goniometer

Universal goniometer

Gravity dependent goniometer or fluid goniometer

Pendulum goniometer

Electro goniometer

Procedure or steps in joint range measurement.

Demonstrate measuring of individual joint range using goniometer

Shoulder joint, elbow joint, radio ulnar joint, wrist joint, MCP joint, PIP joint, Hip joint, Knee joint, ankle joint, subtalar joint , cervical, thoracic & lumbar vertebral Joints.

11. End Feel

Normal & Pathological.

Trick movements.

.Maintenance of record –range of motion, resistance.

Causes for Restriction of Range of Motion

Distinguish between skins, muscle, capsular Contractures.

12. BREATHING EXERCISES

1. Definition

2. Indication & Contraindication.

3. Physiological effect

4. Types of Breathing Exercises

Diaphragmatic breathing exercise.

Apical breathing, Costal breathing, Posterior basal

Glossopharyngeal

Pursed lip breathing

Inspiratory hold

5. Exercise for bronchial hygiene coughing and huffing, home programme.

13. MASSAGE TECHNIQUE

Stroking manipulation- Superficial stroking, deep stroking or Effleurage

Pressure manipulation-

A. Kneading-palmar & digital kneading, ironing

B. Petrissage-picking up, wringing, skin rolling

C. Friction-circular & transverse friction

Percussion manipulation- Clapping, hacking, beating, pounding, tenting Contact heel percussion

Vibratory manipulation- vibratory & shaking

TECHNIQUES USED FOR VARIOUS PARTS OF BODY

Massage for upper limb-scapular region, shoulder joint, upper arm, elbow joint, Forearm, wrist joint, hand

Massage for lower limb-thigh, knee joint, and leg, foot (ankle & toes)

Massage for back-neck and upper back, middle and lower back, gluteal region

Massage for face

Massage for abdomen

THERAPEUTIC APPLICATION OF MASSAGE

1. Relaxation

2. Oedema

3. Radical mastectomy

4. Venous ulcer

5. Painful neuroma

6. Bell's palsy
7. Sprain and Strain
8. Fibrositis

A. RECOMMENDED STUDY MATERIAL:

TEXTBOOKS:

1. Principles of Exercise Therapy by Dena Gardiner, 4th Edition, CBS Publication.
2. Practical Exercise Therapy by Margaret Hollis, 4th Edition; Blackwell Sciences Publication.
3. Therapeutic Exercise by Kisner & Colby, 5th Edition; Jaypee Publication.

REFERENCE BOOKS:

1. Therapeutic exercise: Moving towards Function by Hall & Brody, 3rd edition,
2. Manual Therapy NAGS, SNAGS, MWMS etc. by Brian R Mulligan, 6th Edition, Plane view services
3. Therapeutic Exercise: Treatment planning for progression by Huber, Saunder Publication
4. Peripheral Manipulation by G D Maitland, 3rd Edition .

COMPUTER APPLICATIONS

(Not for University Exam)

Teaching Hours: 80hours (Theory: 40 hours' theory and 40 hours practical)

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)

Teaching Hours: 80 hours (Theory: 40 hours and 40 hours practical)

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.

SECOND YEAR										
Course code	Course title	Teaching scheme				Examination scheme				
		Contact hours			Credit	Theory		Practical		Total
		Theory	Practical	Total		Internal	External	Internal	External	
PT0201	Pathology & Microbiology	100	—	100	5	30 (15+15).	70 (35+35).			100
PT0202	Pharmacology	60	—	60	3	10	40			50
PT0203	Exercise Therapy- II	120	160	280	10	30	70	30	70	100
PT0204	Kinesiology	120		120	6	30	70			100
PT0205	Electro Therapy II	120	160	280	10	30	70	30	70	100
	Clinical Education		480	480	12					
	*Nursing and First aid. (NOT FOR UNIVERSITY EXAMINATION)	20	40	60	2					
Total hours				1380	48					

SYLLABUS CONTENTS OF S.Y.B.P.T

Second Year B. PHYSIOTHERAPY

PATHOLOGY:

Teaching Hours: Theory: 50 hours.

Maximum Marks: Theory: 50 Marks.

Assessment: Written, Internal and University examination.

Internal Examination: 15 marks Theory.

University Examination: 35 marks Theory.

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 aetiology, 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 haematological diseases and investigations necessary to diagnose them and determine their prognosis.

Theory Contents

1. Basics of general pathology

Introduction to pathology

- 1.1. Cell injuries: causes, mechanism, pathogenesis
- 1.2. Reversible cell injury: types, morphological changes including cellular swellings, hyaline change, mucoid change.
- 1.3. Irreversible cell injury: apoptosis / autolysis, types of necrosis & gangrene, calcification (dystrophic & metastatic).
- 1.4. Extra cellular accumulations: amyloidosis

Intracellular accumulations - fatty changes, protein accumulations, glycogen accumulations, pigments
- melanin / hemosiderin

2. Inflammation and repair

- 2.1. Acute inflammation – causes, features, examples
- 2.2. Inflammatory cell and mediators
- 2.3. Chronic inflammation – causes, features, examples
- 2.4. wound healing
- 2.5. Regeneration and repair.

3. Growth disturbances and neoplasia

- 3.1. Atrophy, hypertrophy, hyperplasia, aplasia, hypoplasia, metaplasia, malformation, agenesis, dysplasia
- 3.2. Neoplasia: definition, classification, biological behaviour
- 3.3. Carcinoma and sarcoma, differences between benign and malignant
- 3.4. Carcinogenesis: environmental carcinogens, chemical, viral, occupational, heredity
- 3.5. Cellular oncogenesis, prevention of cancer, precancerous lesions
- 3.6. Malignant neoplasia: grades and stages, local & distant spread
- 3.7. Prevention of cancer Tumour and host interactions: systemic effects

4. Circulatory disturbances

- 4.1. Hyperaemia/Ischemia and haemorrhage
- 4.2. Edema: pathogenesis and types
- 4.3. Chronic venous congestion: lung, liver, spleen, systemic pathology

- 4.4. Thrombosis and embolism: formation, fate and effects
- 4.5. Infarction: types, common sites
- 4.6. Gangrene: types and etio - pathogenesis – Delete (Because it is repeated above)
- 4.7 Shock: pathogenesis, types, morphologic changes.

5. Specific pathology

- 5.1. CVS – atherosclerosis, IHD, MI, HT, CCF, RHD, peripheral vascular diseases.
- 5.2. RS – COPD, pneumonia – lobar, Broncho, viral, acquired, TB – prim & sec, Atelectasis, asthma
- 5.3. Skin – leprosy
- 5.4. NS – CVA, coma, polio, Parkinsonism, myasthenia gravis
- 5.5. Bone and joint – arthritis, osteomyelitis, autoimmune disease, spondylosis, Osteomalacia, GOUT, Tenosynovitis, AS
- 5.6. Muscle – MD, polio, myopathies.

MICROBIOLOGY:

Teaching Hours: Theory: 50 hours.

Maximum Marks: Theory: 50 Marks.

Assessment: Written, Internal and University examination.

Internal Examination: 15 marks Theory.

University Examination: 35 marks Theory.

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.

1. Introduction:

- 1.1. Classification, Shape and arrangement
- 1.2. Disinfection and antiseptic
- 1.3. Sterilization and asepsis
- 1.4. Allergy & hypersensitivity
- 1.5. Immunology – Definition, antigen, antibody reaction, autoimmunity, natural and Acquired immunity.
- 1.6. Infection – Definition, source of infection, portal of entry, spread of infection, type.

2. Systemic Bacteriology:

- 2.1. Gram-Positive cocci – Streptococci, Pneumococci, Staphylococci

- 2.2 .Gram-Negative Cocci – Gono and Meningo cocci
- 2.3. Gram-Positive Bacilli
- 2.4. Gram-Negative Bacilli-Typhoid, Cholera, Dysentery
- 2.5 Aerobic-Diphtheria, T.B., Leprosy
- 2.6. Anaerobic-Tetanus, Gas Gangrene, Botulism.

3. Outline the bacteria causing the following diseases

- 3.1. RTI
- 3.2. Meningitis
- 3.3 Enteric infection
- 3.4. Anaerobic infection
- 3.5. UTI
- 3.6. Leprosy, TB
- 3.7. STD
- 3.8. Wound infection
- 3.9. Hospital acquired infection

4. Viruses – Definition, size, shape, structure, classification, cultivation, diagnosis of Viral infections.

5. Outline the virus causing the following diseases

- 5.1. HIV
- 5.2. Hepatitis
- 5.3. Polio
- 5.4. Measles
- 5.5. Rubella
- 5.6. Herpes.
- 5.7. Covid-19.

Reference Books:

PATHOLOGY

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

MICROBIOLOGY

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

PHARMACOLOGY

Teaching Hours: Theory: 60 hours.

Maximum Marks: Theory: 50 Marks.

Assessment: Written, Internal and University examination.

Internal Examination: 10 marks Theory.

University Examination: 40 marks Theory.

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.

Theory Contents:

1.General Pharmacology:

- 1.1. Classification of drugs, Sources of drugs
- 1.2. Pharmaco-kinetics
- 1.3. Pharmaco-dynamics
- 1.4. Adverse drug reaction
- 1.5. Factors modifying the effects of a drug.

2. Pharmacology in peripheral nervous system and autonomic nervous system

- 2.1. Cholinergic and anti-cholinergic drugs
- 2.2. Adrenergic and antiadrenergic
- 2.3. Skeletal Muscle Relaxants

3. Pharmacology in central nervous system

- 3.1 General Anaesthetics.
- 3.2. Sedatives, Hypnotics and Pharmacotherapy of Sleep Disorders.
- 3.3. Antiepileptics.
- 3.4. Opioids
- 3.5. Drugs for Parkinsonism

4. Pharmacology in inflammatory / immune conditions

- 4.1 NSAIDS
- 4.2. Antihistamines
- 4.3. Drugs for RA & Gout
- 4.4. Corticosteroids

5. Pharmacology in cardiovascular system

- 5.1 Pharmacotherapy of Hypertension.
- 5.2. Anti-anginal drugs
- 5.3. Drugs for congestive heart failure
- 5.4. Pharmacotherapy of cardiac arrhythmias, Pharmacotherapy of Myocardial ischemia
- 5.5. Pharmacotherapy for atherosclerosis: Hypolipidemic, Anticoagulant, Antiplatelet and fibrinolytic agents.

6. Pharmacology in respiratory system

- 6.1. Drugs for Cough
- 6.2. Drugs for Bronchial asthma, COPD and rhinitis.

7. Immunological agents and vaccines (In brief)

- 7.1. Immuno-modulators

8. Antimicrobial agents

- 8.1. Introduction and Sulphonamides
- 8.2. Beta Lactam Antibiotics

- 8.3. Macrolides
- 8.4. Broad Spectrum Antibiotics
- 8.5. Aminoglycosides
- 8.6. Quinolones
- 8.7. Antiviral drugs
- 8.8. Anti-tubercular and Anti-leprotic Drugs
- 8.9. Antimalarial and Other Anti-protozoals

9. Pharmacology in endocrine system

- 9.1. Drugs for Diabetes Mellitus
- 9.2. Thyroid and Antithyroid drugs
- 9.3. Drugs affecting calcium balance

10. Pharmacology in sports

- 10.1. Anabolic steroids
- 10.2. Drug abuse in sports

A. RECOMMENDED STUDY MATERIAL:

TEXTBOOKS:

1. Textbook of Pharmacology for Physiotherapy, Padma Udaykumar, Jaypee Publication.
2. Pharmacology & Pharmacotherapeutics, Edition, RS Satoshkar, SD Bhandarkar, Nirmala N Rege, Popular Publications

REFERENCE BOOKS:

1. Essentials of Medical Pharmacology, Edition, KD Tripathi, Jaypee Publications
2. Pharmacology; Rang H.P., dale M.M., et. al – Churchill livingstone, USA.
3. Lippincott's illustrated reviews. Pharmacology :Michelle Alexia Clark; Richard Finkel; Jose A Rey and Karen Whalen; Wolters Kluwer Health/Lippincott Williams & Wilkins
4. Handbook of Pharmacology, 1st Edition, Dr UN Panda, AITBS Publication
5. Pharmacology for Physical therapist by Panus
6. Textbook of Pharmacology by Padmaja.
7. Clinical pharmacy and Therapeutics; Roger Walker, Cate Whittlesea; Churchill Livingstone (Geriatric Pharmacotherapy)

EXERCISE THERAPY II

Teaching Hours: 280 (Theory: 120 hours and Practical 160 hours).

Maximum Marks: Theory: 200 marks.

Assessment: Written, Internal and University Examination.

Internal Examination: 30 marks Theory. 30 marks Practical.

University Examination: 70 marks Theory. 70-marks practical.

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. Analyse normal human posture and its associated problems, its management.
4. Analyse 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. STRETCHING

1. Definition
2. Indication & Contraindication
3. Purpose of stretching
4. Physiological changes in muscle to stretch
5. Neurological changes in muscle to stretch
6. Types of stretching
 - Passive
 - Active or self-stretching

PNF

Ballistic stretching

Dynamic

Isometric

1. Lower Extremity muscle stretching

Iliacus & psoas major, adductor, hamstring, Tensor fascia latae, quadriceps, Tendo Achilles (gastrocnemius & sole us), Piriformis, Tibialis anterior, Peroneus longus, Peroneus brevis, EHL, EDL, EDB & Miscellaneous.

Trunk & Upper Extremity stretching

Low back extensors, Levator scapulae & upper fibres of trapezius, Middle fibres of trapezius & Rhomboids major and minor, Sternocleidomastoid, Pectoralis major, Supraspinatus, Subscapularis, Infraspinatus & teres minor, Latissimus dorsi, Elbow flexors-biceps, Elbow extensors-triceps, Wrist extensors, Wrist Flexors, Common extensors-ECRL, ECRB, ECV, ED, Wrist & finger flexors-FCR, FCU, FDS, FDP, Intrinsic muscles of hand, & Miscellaneous.

2. TRACTION

1. Definition
2. Mechanism of action of traction
3. Indication & Contraindication of traction

4. Types of traction

A. Based on methods of application-

1. Manual
2. Mechanical
3. Positional
4. Inversion
5. Hydraulic

B. Based on nature of pull –

1. Continuous traction
2. Intermittent traction

C. Based on regions applied –

1. Cervical traction
2. Lumbar traction/Pelvic traction/Knee joint/Ankle joint

5. Traction parameters - (Weight, Time, Hold, Relax)

3. MOBILIZATION

1. Introduction
2. Definition
3. Joint Range-Outer range, Middle range, Inner range
4. Causes of joint range limitation
5. Effect of prolonged immobilization
6. Indication & Contraindication

7. Maitland, Kaltenborn,

Principles, Indications and Contraindications, Biomechanical basis for mobilization, Effects of joint mobilization, Grades of mobilization, Principles of mobilization. Techniques of mobilization for upper limb, lower limb, Precautions.

8. Principles of Application of Mobilization

- 1 .Position of patient
2. Position of therapist
- 3 .Relaxation
4. Fixation
5. Support or Stabilization
6. Direction of movement
7. Force & Range / Distraction or Traction
8. Intensity & Duration
9. Methods of peripheral joint mobilization
10. Muscle relaxation techniques
11. Free exercise
12. Hold relax
13. Contract relax
14. Muscle stretching techniques
15. Forced passive movement
16. Passive stretching / self-stretching
17. Mechanical stretching
18. Oscillatory technique
19. Sustained translatory joint play techniques.

4. MUSCLE GRADING/MANUAL MUSCLE TESTING

1. Introduction
2. Principles
3. Uses
4. Precaution & Contraindication
5. Types of muscle grading
6. Available ROM method
7. Make or Break test
8. Active resistance test
9. Grading system
10. Medical Research Council (MRC)
11. Plus & Minus grade
12. Daniels & Worthingham
13. Kendall & Kendall
14. Demonstrate the skill to grade
15. Upper limb muscle
16. Lower limb muscle
17. Trunk muscle

5. MAT ACTIVITIES & FUNCTIONAL RE-EDUCATION

1. Introduction
2. **Demonstrate common mat activities**
 1. Rolling-Prone on elbows
 2. Prone on hands
 3. Hook Lying
 4. Bridging
 5. Quadruped Position
 6. Long Sitting
 7. Short Sitting
 8. Kneeling

9. Half Kneeling
10. Standing
11. Walking
12. Equilibrium/balancing exercises.
13. Transfer activities.

6. MUSCLE STRENGTHENING/RE-EDUCATION OF MUSCLES

1. Definition
2. **Demonstrate various re-education techniques on different group of muscles** of Upper extremity, lower extremity, and trunk.
3. **Demonstrate the progressive exercise in strengthening using various methods** (According to muscle power-Grade I to Grade V)

7. RESISTED EXERCISE

1. Definition
2. Types of resisted exercise-Manual & Mechanical
3. Manual-Definition, principle, technique by therapist & patient
4. Mechanical-Definition, principle, technique by weights, pulleys, spring
5. Uses of resisted exercise

6. PROGRESSIVE RESISTED EXERCISE

Definition

Repetition maximum (RM) method

Active (Concentric, Eccentric, Isometric, Isokinetic, Open-Chain, Closed-Chain) Plyometric, Core/postural stabilization exercise, SAID principle (Specific Adaptation to Imposed Demands)

Specific exercise regimens:

Isotonic: de Lormes, Zinovieff (oxford technique), Macqueen, Circuit weight training Isometric: BRIME (Brief Resisted Isometric Exercise), Multiple Angle Isometrics.

8. BALANCE EXERCISES

BALANCE

1. Definition
2. Cause of Balance Disorder

3. Condition
4. Evaluation
5. Balance Exercise

2. BALANCE EXERCISE

1. Exercise for Weakness
2. Exercise for Movement Strategies
3. Static Balance Exercise
4. Dynamic Balance Exercise
5. Balance Exercise for Vestibular Dysfunction

- CO- ORDINATION EXERCISES

1. Co-Ordination
2. Definition
3. Causes of Co-Ordination Disorder
4. Condition
5. Tests for Co-Ordination
6. Co-Ordination Exercise

CO-ORDINATION TEST

1. Standing
2. Walking
3. Sitting or Supine
4. Finger to Nose
5. Finger to Therapist Finger
6. Finger to Finger
7. Alternate Nose to Finger
8. Finger Opposition
9. Pronation /Supination
10. Alternate Heel to Knee
11. Drawing an Imaginary Circle on Air with UL & LL.
12. Position Holding
13. Rebound Test

9. – POSTURE

1. Definition
2. Postural control
3. Standard posture
4. Types of posture-Standing & Dynamic
5. Normal Posture – Overview of mechanism of normal posture.
9. Abnormal Posture – Assessment, Types, etiogenesis.
10. Mobility evaluation of joint / muscles & its implication on posture.

Faulty or Abnormal postures

1. Excessive lordosis
2. Kyphotic lordosis
3. Sway back
4. Flat back
5. Flat neck
6. Scoliosis
7. Forward head Assessment of posture

10- PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION (PNF)

1. Introduction
2. Definition
3. Principles Pattern of motion Diagonals Motion components
4. **Basic procedure**
 1. Agonist & Antagonist.
 2. Traction & Approximation
 3. Normal timing
 4. Stretch stimulus.

5. Stretch reflex
6. Manual contact
7. Command & Communication
8. Line of movement

5. PNF patterns for Upper Extremity

D1 Flexion, D1 Extension, D2 Flexion, D2 Extension

2. PNF pattern for Lower Extremity

D1 Flexion, D1 Extension, D2 Flexion, D2 Extension

PNF PATTERN -TRUNK.

7. DEMONSTRATE PNF TECHNIQUES

1. Repeated contractions
2. Slow reversals
3. Rhythmic stabilization
4. Hold relax
5. Rhythmic initiation.
6. Slow reversal Hold.
7. Contract relax
8. Slow reversal hold relax.

12. – HYDROTHERAPY

1. Introduction
2. Definition
3. Principle- Buoyancy, Hydrostatic Pressure, Hydrodynamic Pressure, Turbulence
4. Indication & Contraindication.
5. Physiological & Therapeutic effects
6. Advantages
7. Exercises in hydrotherapy.

8. Hydrodynamics, physiological and applications of Bad Ragaz Technique, indications and contraindications.

13. AEROBIC & ANAEROBIC EXERCISE

Definition and its related terms.

Physiological effects and therapeutic uses.

Low Impact, High Impact, Dance.

14. POSTURAL DRAINAGE

1. Definition.

2. Indications & Contraindications.

3. Principles.

4. Techniques.

15. EXERCISE PRESCRIPTION

Warm up/ cool down, Frequency, Intensity, Duration, Mode, and Specificity.

Reference Books:

1. Carolyn Kisner, Lynn Allen Colby: Therapeutic Exercise.
2. Gardiner DM: Principles of Exercise Therapy.
3. Hollis & Fletcher Cook: Practical Exercise Therapy.
4. Hislop HJ & Montgomery J: Daniel's & Worthingham's Muscle Testing Techniques of Manual Examination.
5. Basmajian JV & Wolf SL: Therapeutic Exercise.
6. Holey EA, Cook EM: Evidence Based Therapeutic Massage – A practical guide for therapists.
7. Champion. R: Hydrotherapy: Principles & Practice.
8. Hall CM & Brody LT: Therapeutic Exercise - moving toward function.
9. Skinner JS: Exercise testing & Exercise prescription for special cases: theoretical basis and clinical application.

KINESIOLOGY:

Teaching Hours: 80

Maximum Marks: 100 marks.

Assessment: Written, Internal and University examination.

Internal Examination: 30 marks Theory.

University Examination: 70 marks Theory.

1. BASIC CONCEPTS OF BIOMECHANICS

1.1. Introduction - Kinematics and Kinetics

1.2. Kinematics: Description of motion, Introduction to forces, Introduction to Statics & Dynamics,

1.3. Translatory motion in linear & concurrent force systems, Additional linear force considerations.

1.4. Kinetics: Moment of force, Muscle forces, Torque resisted, Lever systems, Force components,

1.5. Translatory effects of force components, Total rotation produced by a force.

2. JOINT MECHANICS

2.1 Classification of joints

2.2 Osteokinematics & Arthrokinematics

2.3 Concave Convex Rule

2.4 Joint function, kinetics & kinematics

2.5 Tissues present in human joint including fibrous tissue, bone cartilage and connective tissue.

2.6 Statics and dynamics

2.7. Structural dysfunction

2.8 General effects of disease, injury and immobilization.

3. MUSCULAR MECHANICS

3.1. Elements of muscle structure: Composition of a Muscle Fiber, The Contractile Unit

3.2. The Motor Unit, Muscle Structure, Muscular Connective Tissue. Muscle function, Types of muscle contractions and muscle work, Mechanism of Muscle Contraction.

3.3. Effects of immobilization, injury and aging

4. THE VERTEBRAL COLUMN

4.1 General structure and function

4.2 Structure & Biomechanics of Intervertebral Disc

4.3 Regional structure and function – Cervical region, thoracic region, lumbar region, sacral region

4.4 Muscles and Ligaments of Cervical, Thoracic, Lumbar & Sacral regions.

4.5 Biomechanics of facet joint & Inter body Joint during spinal motions: Flexion, Extension, Side Flexion, and Rotation

4.6 General effects of injury and aging

5. THE THORAX AND CHEST WALL

General structure and function

5.1 Rib cage and the muscles associated with the rib cage

5.2 Ventilatory motions: its coordination and integration

5.3 Developmental aspects of structure and function

5.4 Changes in normal structure and function in relation to pregnancy, scoliosis and COPD

6. THE TEMPOROMANDIBULAR JOINT

6.1. General features,

6.2. Structure & function

6.3. Age related changes Dysfunction

7. THE SHOULDER COMPLEX

7.1. Structural components of the shoulder complex including the articulating surfaces, capsular attachments and ligaments and movements of the following joints: Sternoclavicular, Acromioclavicular, Scapulothoracic, Glenohumeral.

7.2 Dynamic and Static stability of shoulder joint including function of shoulder complex including dynamic stability of the glenohumeral joint musculohumeral Rhythm, Scapulothoracic and glenohumeral contributions

7.3. Muscles of Shoulder Complex

8. THE ELBOW COMPLEX

8.1. Structure and function of the elbow joint – humeroulnar and humeroradial articulations, superior And inferior radioulnar joints

8.2. Mobility and stability of the elbow complex

8.3. Effects of immobilization and injury

9. THE WRIST AND HAND COMPLEX

9.1 Structure and Function of:

a - Radiocarpal joint

b - Metacarpal joint.

c - Carpometacarpal,

d - Metacarpophalangeal and - Interphalangeal joints.

9.2 Describe Prehension, Power, Cylindrical, Spherical & Hook grips

9.3 Describe Precision handling, Pad to pad, Tip to tip and pad to side prehension and functional position of wrist and hand iv Stability and Mobility of Wrist and Hand Complex

10. THE HIP COMPLEX

10.1. Structure of Hip Joint including the articulating surfaces on the pelvis & the femur; joint capsule. Ligaments & Muscles of Hip Complex

10.2 Pelvis motion; anterior posterior pelvic tilting. Lumbar pelvic rhythm, lateral pelvic tilting, Pelvic rotation.

10.3 Describe reduction of forces with weight shifting and using a cane and deviations form normal in muscular weakness & bony abnormalities.

10.4 Stability and Mobility Function of Hip Complex

10.5 Hip joint pathology- arthrosis, fracture, bony abnormalities of the femur

11. THE KNEE COMPLEX

11.1. Structure of the Tibiofemoral joint, Articulating surfaces on femur and tibia, the menisci, joint capsule and bursa, Ligaments and Muscles.

11.2. Anterior- posterior and medio- lateral stability of Knee joint

11.3 Locking and Unlocking Mechanism of Knee Joint: function of menisci and Muscle function.

11.4 Structure and Function of the patellofemoral joint

11.5 Effects of injury and disease in the Tibiofemoral and patellofemoral joints.

12. THE ANKLE AND FOOT COMPLEX

12.1. Structure, Function ligaments, Muscles and function of the following:

- a - Ankle joint,
- b - Tibiofibular joint
- c - Subtalar joint
- d - Talocalcaneonavicular joint
- e - Transverse tarsal joint
- f - Tarsometatarsal joint
- g - Metatarsophalangeal joint
- h - Interphalangeal joint

13. POSTURE

13.1 Static and Dynamic posture

13.2 Kinetics and Kinematics of posture

13.3 Ideal posture analysis of posture.

13.4 Effects of age, pregnancy, occupation and recreation on posture

14. GAIT

Human locomotion

Subjective & Objective evaluation

Gait cycle & Measurable parameters (Step Length, Step Width, Stride Length, Foot Angle, Cadence)

Kinetics and kinematics of gait

Determinants of gait

Kinetics and Kinematics of Various Activities of Daily Living Level

Supine to Sitting, Sitting to Standing, Squatting,

Climbing up & down.

Lifting, Pulling, Pushing, Overhead activities,

Running, Jogging

Pathomechanics (Only identification of deviations from the normal)

15. IMPETUS

15.1 Impetus to one's own body when it is supported by water,

15.2 Impetus to external objects,

15.3 receiving and intercepting impetus

16. ACTIVITIES OF DAILY LIVING (ADL)

16.1. Kinetics & Kinematics: Supine to sitting, sitting to standing, Squatting, climbing up and down, pushing, pulling, overhead activities, walking, running, jogging.

A. RECOMMENDED STUDY MATERIAL:

TEXTBOOKS:

1. Joint structure and function- Cynthia norkins, 4th Edition, Jaypee Publication.
2. Clinical kinesiology – Brainstorm, 5th Edition, Jaypee Publication.

REFERENCE BOOKS:

1. Kinesiology by K Wells, 6th Edition; Saunders Publication.
2. Biomechanical basis of human movement, Joseph Hamill & Kathleen M.Knutzen, 3rd Edition, LWW Publications.
3. Bio-mechanics of Musculoskeletal System by Nigg, 2nd Edition, John Wiley Publication.

4. Basic Bio-mechanics of musculoskeletal system by Frenkle, 3rd edition, Lippincott Williams & Wilkins.

ELECTROTHERAPY II

Teaching Hours: 280 (Theory: 120 hours and Practical: 160 hours)

Maximum Marks: Theory: 200 marks.

Assessment: Written, Internal and University examination.

Internal Examination: 30 marks Theory. 30 marks Practical.

University Examination: 70 marks Theory. 70 marks practical

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 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:

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

SELECTION OF CURRENT

- 1 Differentiate between types of current, duration, shape, frequency used in stimulating nerve and muscle.

1. LOW FREQUENCY CURRENTS

Electrode tissue interface, Tissue Impedance, Types of Electrode, Size & Placement of Electrode – Unipolar, Bi-polar, Electrode coupling, Current flow in tissues, Lowering of Skin Resistance.

INTERRUPTED DIRECT CURRENT & GALVANIC CURRENT –

1. Definition, Type, Duration, Shape, Frequency
2. Production
3. Physiological effect & Therapeutic effect of Interrupted direct current
- 4 Effect of IGC on Innervated muscle & Denervated muscle

Technique of application of IGC

Motor Point

Preparation of apparatus (Assembling, Testing)

Preparation of patient

Stimulation of motor point

Precautions.

FARADIC CURRENT –

1. Definition, Type, Duration
2. Production, Surging of Faradic Current.
3. Characteristic and modified faradic current,
4. Sinusoidal current (Effects & its Application),
5. Parameters of stimulation,
6. Physiological effects & Therapeutic effects of Faradic Current.

Technique of application of Faradic Currents

1. Motor Point

2. Preparation of apparatus (Assembling, Testing)

3. Preparation of patient

4. Stimulation of motor point

5. Indications and contraindications

6. Precautions.

7. **Group muscle stimulation, faradic foot bath, faradism under pressure and pelvic floor**

Muscle re-education.

Di-dynamic currents - Definition, therapeutic effects & application.

HVPGS (High-Voltage Pulsed Galvanic Stimulation) - Definition, its uses.

Sinusoidal Currents.

IONTOPHORESIS

1. Definition
2. Physics of iontophoresis
3. Technique of application of iontophoresis
4. Ions commonly used in iontophoresis and their clinical indication
5. Physiological effect & Therapeutic effect of iontophoresis
6. Dosage of iontophoresis
7. Dangers & Contraindication of iontophoresis.

-TENS

1. Definition
2. Neurophysiology of pain
3. Acute pain & chronic pain
4. Pain pathway
5. Neuromodulation of pain
6. Pain modulation- Gate control theory, descending pain suppression
7. Parameter of Tens-Waveform, Frequency, Pulse width, amplitude

Type of Tens-

1. High Frequency Low Intensity Tens or Conventional Tens
2. Acupuncture like Tens
3. Brief Intense Tens
4. Burst Mode Tens
5. Electrode Placement,

Advantage & Disadvantage of Tens,

Uses of Tens and Contraindication of Tens.

2. HIGH FREQUENCY CURRENTS

2.1. SHORT WAVE DIATHERMY (SWD)

1. Definition, 2. Principle of working, 3. Indication & contraindication of SWD 4. Bio-physics of deep heating using SWD, a. Capacitor or condenser field method b. Inductance or Magnetic field method,

Technique or Method of application of SWD

1. **Preparation of equipment** (warming, tuning, testing of machine)

2. Application of treatment- A. Condenser field method/Capacitor field method

B. Cable method/Inductothermy

3. Condenser field method

A. Type of electrode

B. Size of electrode

C. Electrode Spacing-Wide & Narrow spacing

D. **Electrode positioning** -1. Co-planar 2. Contra planar 3. Mono planar

4. Cross fire method.

Cable field method A. Electrode B. Electrostatic field & Magnetic field C. Advantage D. Dosage.

4. Dangers of SWD.

5. Precautions of SWD.

2.2 PULSED SHORT-WAVE DIATHERMY –

A. Definition, Frequency, Wavelength

B. Production

C. Parameters-

1. Pulse repetition rate (PRR)

2. Pulse duration (PD)

3. Peak pulse power (PPP)

D. Physiological effect

E. Indication & contraindication

F. Dosage.

2.3 MICRO WAVE DIATHERMY (MWD) –

1 Definition

2 Bio-physics of micro wave diathermy

3 Indication & contraindication of MWD

4 Production of MWD (Magnetron).

5 Technique of application of MWD

A. Patient preparation

B. Selection of treatment applicator

C. Selection of appropriate power level and application of treatment

D. Dosage

E. Physiological & Therapeutic effects.

F. Dangers

2.4 CAPACITIVE ENERGY TRANSFER (LONG WAVE DIATHERMY)

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

2.5 ULTRASOUND –

1 Definition

- 1 Bio-physics of ultrasound
- 2 Indication & contraindication of ultrasound
- 3 Properties of ultrasound-Reflection, Transmission, Absorption
- 4 Ultrasonic field
- 5 Coupling media
- 6 Production of ultrasound
- 7 **Technique of application of ultrasound**

A. Testing of machine

B. Application of ultrasound

1. Direct contact method
2. Water bath method
3. Water bag method

C. Treatment parameters

1. Intensity.
2. Mode-Continuous or Pulsed
3. Frequency-1 MHz or 3 MHz
4. Treatment duration
5. Pulsed mark: Space ratio
6. Dosage
7. Physiological & Therapeutic effects of ultrasound.
8. Dangers of ultrasound

PHONOPHORESIS

A. Definition

B. Principle of working

C. Drugs used in phonophoresis

D. Techniques of application of phonophoresis

E. Contraindication.

ACTINOTHERAPY:

2.6 INFRARED RADIATIONS:

1 Definition

2. Production-Types of generators (Luminous & Non-Luminous), Working Indication & Contraindication

3. Physiological & Therapeutic effect of IRR

Dangers

4. Technique of treatment

A. Choice of apparatus

B. Arrangement of lamp and patient

C. Preparation of patient

D. Application of treatment

E. Treatment frequency and duration

2.7 ULTRA VIOLET RAYS (UVR) –

1. Definition

2 Classification

3 Production of UVR

1. Mercury vapour lamp-1. Air cooled medium pressure Mercury vapor lamp (Alpine Sun Lamp)

2. Water cooled medium pressure Mercury vapor Lamp (Kromayer Lamp)

2. Fluorescent Tube (Theraktin Tunnel)

1. Tridymite formation

2. Cooling of lamp.

3 Technique or principle of application of treatment

A. Preparation of patient

B. Preparation of apparatus

C. Setting up

D. Application

E. Progression.

1 Dosage

A. Test dose

B. Calculation of progression of dosage

2. PUVA apparatus

3. Care of lamp

4. Sensitizers, Photosensitization, Filters.

5. Erythema, Pigmentation, Penetration

6. Indication & Contraindication.

7. Physiological effect & Therapeutic effect of UVR

8. Demonstrate of UVR for following conditions

Acne-shoulder&chest, back&chest, Alopecia areata & Totalis, Psoriasis, ulcer Pressure sore, Rickets, General body bath.

2.8 LASER –

1 Definition

2 Properties of laser

A. Monochromaticity

B. Coherence

C. Collimation

1 Production of laser

A. Lasing medium

B. Resonating chamber

C. Energy source

2 Types of laser

A. Ruby laser or crystal laser

B. Helium-neon laser or gas laser

C. Diode laser or semiconductor laser

3 Technique of application

A. Grid method

B. Scanning method .

2 **Dosage parameters** (Area of treatment, energy density, pulse repetition rate, power output, irradiation)

5. Indications & Contraindications

6. Physiological effect & Therapeutic effect

7. Dangers.

2.9 CARE OF WOUND – Ultrasound, U.V.R. & LASER.

MEDIUM FREQUENCY CURRENTS

INTERFERENTIAL CURRENT

1. Definition

2. Production of interferential current

3. Types of interferential current

1. Static interferential current or Classical interferential current (4 pole method)

2. Dynamic interferential current or Isoplanar vector field (4 pole method) or four electrodes with rotating vector

Parameters of IFT

1. Quadripolar or Bipolar application
 2. Vector or Scanning mode
 3. Suction versus Plate electrode
 4. Current intensity
 5. Frequency sweep
 6. Amplitude modulated frequency
 7. Treatment duration
5. Indications & contraindication of IFC
 6. Physiological effects of IFC
 7. Dangers of IFC

RUSSIAN, RHEBOX CURRENTS.

RECENT ADVANCED ELECTROTHERAPY:

Computerization in electrotherapy.

10. **Combination therapy** - Principles, techniques of application, physiological effect & therapeutic effects, indications, contraindications & dangers.
11. **Intermittent Pneumatic compression Therapy** unit, its operation and different methods of application region wise.

RECOMMENDED STUDY MATERIAL:

TEXTBOOKS:

1. Clayton's Electrotherapy (Theory and Practice) – Clayton's Aibs publications.
2. Electrotherapy Explained – John Low and Reed 4th edition B & H publications.
3. Physical Agents in Rehabilitation: From Research to Practice by Cameron.

REFERENCE BOOKS:

1. Electrotherapy: Evidence based Practice by Kitchen Sheila, 11th Ed.
2. Basis of Electrotherapy- Subhash Khatri 1st edition. Jaypee brothers.
3. Practical in Electrotherapy by Joseph Kahn, Churchill Livingstone.

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**

THIRD YEAR											
Course code	Course title	Teaching scheme				Examination scheme					
		Contact hours				Credit	Theory		Practical		Total
		Theory	Practical	Total	Internal		External	Internal	External		
PT0301	Medicine (Including Dermatology)	100	—	100	5	30	70			100	
PT0302	Neurology (Including Pediatrics)	100	—	100	5	30	70			100	
PT0303	Surgery(including Gynecology &Obstetrics)	100		100	5	30	70			100	
PT0304	Orthopedics	100		100	5	30	70			100	
PT0305	Physical and functional diagnosis	100	160	260	9	30	70	30	70	200	
	Clinical Education			660	29						
	TOTAL HOURS				TOTAL HOURS						

SYLLABUS CONTENTS OF T.Y.B.P.T

T.Y.B. PHYSIOTHERAPY

GENERAL MEDICINE:

Teaching Hours: 100 hours.

Maximum Marks: 100 (Theory: 100)

Assessment: Written, Internal and University examinations

Internal Examination: 30 marks Theory

University Examination: 70 marks Theory

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

General Medicine:

1. Respiratory Diseases

- 1.1. Lung function tests, Pneumonia,
- 1.2. Interstitial Lung Disease (ILD),
- 1.3. Cystic fibrosis, Respiratory failure,

- 1.4. Upper Respiratory Tract Infection (URTI),
- 1.5. Pulmonary oedema,
- 1.6. Pulmonary embolism, lung abscess,
- 1.7. COPD (Bronchiectasis, Emphysema, Chronic Bronchitis),
- 1.8. Asthma, Pleural effusion, Pneumothorax, Empyema.

2. Cardio Vascular Diseases:

2. 1. Rheumatic fever,
- 2.2. Valvular lesions,
- 2.3. Congestive cardiac failure,
- 2.4. Ischemic heart diseases (Angina pectoris and myocardial infarction) stress test,
- 2.5. Cardiac arrest,
- 2.6. Peripheral vascular diseases (TAO, Raynaud's disease), Cardiomyopathy, Congenital heart
- 2.7. Disease, Myocarditis,
- 2.8 Hypertension.

3. Endocrinal Disorders:

- 3.1. Diabetes mellitus,
- 3.2. Obesity,
- 3.3 Thyroid disorder.

4. Gastrointestinal Disorders:

- 4.1. Peptic ulcer,
- 4.2. Pancreatitis,
- 4.3. Dysenteries and Diarrhoea,
- 4.4. Inflammatory bowel diseases,
- 4.5. Jaundice,
- 4.6. Cirrhosis of liver.

5. Infectious Disease:

- 5.1. Tuberculosis,
- 5.2. Malaria,
- 5.3. Typhoid,
- 5.4. Infective hepatitis,
- 5.5. Tetanus,
- 5.6. Covid19,
- 5.7. Mucomycosis.

6. Blood disorder:

- 6.1. Anaemia,

6.2. Haemophilia.

7. Nutritional Disorder:

8. Vitamins and their deficiencies:

8.1. Disorders including rickets and osteomalacia.

9. E.N.T.

9.1. Use of audiometry in assessment of hearing-outline.

9.2. General introduction to diseases of E.N.T.

9.3. Otitis media,

9.4. Bell's palsy,

9.5. Sinusitis and rhinitis.

10. OPHTHALMOLOGY

10.1. Common eye disease including Refractory errors,

10.2. Conjunctivitis and trachoma.

10.3. Cataract, Glaucoma, Squint and Ptosis.

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

11. Skin conditions:

11.1. Structure and functions of normal skin,

11.2. primary and secondary skin lesions,

11.3. Scabies and pediculosis.

11.4. Fungal infections of the skin: Dermatophytosis, Pityriasis, Versicolor, Candidiasis. Bacterial infections of skin-impetigo / Boil. Viral infections of Skin-Herpes zoster. Eczema, Dermatitis,

11.5. Allergies., Psoriasis, Acne, Alopecia, Vitiligo, Leukoderma.

11.6. Leprosy / Lepra - reaction/Physiotherapy in leprosy,

11.7. Sexually transmitted diseases: Syphilis: primary & secondary, Gonorrhoea, Cancroid, AIDS.

12. RADIOLOGY

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

Reference Books:

1. Boon NA, Colledge NR, Walker BR, Hunter JA: Davidson's Principles and Practice of Medicine.
2. Fauci, Braunwald, Kasper, Longo, Jameson, Loscalzo: Harrison's principles of internal medicine. Vol I & II.
3. McPhee, Papadakis, Tierney: Current medical diagnosis and treatment.
4. Swash M: Hutchinson's clinical methods.
5. Ogilvie & Evans: Chamberlain's symptoms and signs in clinical medicine – An introduction to medical diagnosis.
6. Douglas, Nicol & Robertson: Macleod's clinical examination.
7. Shah SN: API text book of Medicine. Vol I & II,
8. Golwalla SA, Golwalla AF: Medicine for students.
9. Das PC: Textbook of medicine.
10. Mehta PJ, Joshi SR, Mehta NP: Practical Medicine.

NEUROLOGY:

Teaching Hours: 100 hours.

Maximum Marks: 100 (Theory: 100)

Assessment: Written, Internal and University examinations

Internal Examination: 30 marks Theory

University Examination: 70 marks Theory.

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 haematological investigations, chest X-ray, C.T. and MRI scans done for neurological conditions with NCV/EMG findings.

1. Lesions and diseases of various areas of the brain:

1.1. Pyramidal system,

1.2. Extra-pyramidal system,

1.3. Cerebellar system,

1.4. Spinal cord,

1.5. Upper and lower motor neuron, Cranial nerves,

1.6. Brachial plexus,

1.7. Lumbosacral plexus and peripheral nerves.

2. Causes, Clinical features, management of various conditions:

2.1. Unconscious patient,

2.2. Hemiplegia,

2.3. Paraplegia,

2.4. Quadriplegia,

2.5. Cerebral diplegia.

2.6. Spastic child,

2.7. Foot drop wrist drop.

3. Disorders of cerebral circulation:

3.1. Infections Encephalitis,

3.2 Meningitis,

3.3. Poliomyelitis,

3.4. Transverse myelitis,

3.5 Slow viral diseases.

3.6 Diseases of Peripheral Nerves Peripheral neuropathy,

3.7. Other neuropathies

4. Muscle disorders:

4.1 Myopathy,

4.2. Polymyositis,

4.3. Muscular dystrophies,

4.4 Muscular dystrophies.

5. Degenerative diseases:

5.1. Parkinsonism,

5.2. Myasthenia gravis,

5.3. Motor neuron diseases,

5.4. Spinocerebellar degenerations and diseases of anterior horn cell,

5.5. Dementia.

6. Costo-clavicular syndrome:

6.1. Costo-clavicular syndrome.

6.2. Demyelinating disorders including multiple sclerosis Multiple sclerosis, Other diseases

6.3. Giddiness and vertigo Giddiness and vertigo

7. Growth and development of a child

Growth and development of a child from birth to 12 years, including physical, social, adaptive development.

8. Cerebral Palsy

Etiology - prenatal, perinatal and postnatal causes, pathogenesis, types of cerebral palsy (classification), findings on examination, general examination, examination of C.N.S., musculoskeletal system, respiratory system, G.I. Tract and nutritional status.

9. Down syndrome, Mental retardation, microcephaly, blindness, hearing and speech impairment,

- 9.1. Squint and convulsions.
- 9.2. Downs syndrome,
- 9.3. Mental retardation,
- 9.4. Microcephaly,
- 9.5 blindness,
- 9.6. Hearing and speech impairment,
- 9.7. Squint and convulsions.

10. Prevention:

- 10.1. Appropriate management of high-risk pregnancies,
- 10.2. Prevention of neonatal and postnatal infections,
- 10.3 Metabolic problems. Prevention: Appropriate management of high-risk pregnancies,
- 10.4. Prevention of neonatal and postnatal infections, metabolic problems

11. Muscular Dystrophy

- 11.1 Various forms, modes of inheritance and clinical manifestation,
- 11.2 Physical findings concerning disabilities,
- 11.3. Progression of various forms and prognosis,
- 11.4 Treatment goals in forms that are not fatal.

12. Spina Bifida Meningomyelocele:

Development, clinical features - lower limbs, Bladder and bowel complications – Urinary Tract Infection (UTI), Hydrocephalus, medical management.

13. Still's Disease:

Classification, pathology, in brief, physical findings, course and prognosis, treatment, prevention and correction of the deformity.

14. Acute C.N.S. infections:

- 14.1. Classification (Bacterial and Viral), the acute illness, C.N.S.
- 14.2. Sequel leading to mental retardation, blindness, deafness, speech defect, motor paralysis,
- 14.3 bladder and bowel problems,

14.4 Seizure disorder and specific problems such as subdural effusion,

14.5. Hydrocephalus,

14.6 Pressure sores,

14.7 Feeding difficulties.

15. Arnold Chiari Malformation,

16. Basilar Impression,

17. Klippel-Feil Syndrome,

18. Achondroplasia,

19. Cerebral Malformation,

20. Autism,

21. Dandi Walker Syndrome

22. Arnold Chiari Malformation,

23. Basilar Impression,

24. Klippel-Feil Syndrome,

25. Achondroplasia,

26. Cerebral Malformation,

27. Autism,

28. Dandi Walker Syndrome.

29. Normal diet of new-born and child:

List dietary calorie, fat, protein, mineral and vitamin requirement in normal child and a child with malnutrition. Childhood obesity. Etiology, findings, and treatment of rickets, vitamin D deficiency and resistant rickets.

30. Lung infections Clinical findings, complications and medical treatment of bronchiectasis.

Reference Books:

- 1 Neurology and neurosurgery illustrated, Lindsay
- 2 Textbook of medicine by Golwala,
- 3 Practical Medicine by P J Mehta

- 4 Physical rehabilitation, Susan B. O'Sullivan .
- 5 Clinical Neuroanatomy by Vishram Singh, Latest Edition, Elsevier
- 6 Cash's Textbook of Neurology for Physiotherapists by Patricia A. Downie, Latest Edition, Jaypee Publication
- 7 Physiotherapy in Neuro-conditions by Glady Samuel Raj, Latest edition, Jaypee Publication.

SURGERY

Teaching Hours: 160 hours.

Maximum Marks: 100 (Theory: 100)

Assessment: Written, Internal and University examinations

Internal Examination: 30 marks Theory

University Examination: 70 marks Theory

Objectives:

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

1. Describe the effects of surgical trauma and anaesthesia 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 tumours, PNI and pain.

7. To read and interpret investigations including findings of X-ray C.T., M.R.I.

GENERAL SURGERY:

1. Acute infections:

- 1.1. Inflammatory fever,
- 1.2. Bacteraemia,
- 1.3. Septicaemia,
- 1.4. Pyemia,
- 1.5. Toxaemia.
- 1.6. Specific types - Cellulitis - sites
- 1.7. Lymphangitis,
- 1.8. abscess with special reference to hand infection, carbuncle.

2. Specific types continued:

- 2.1. Tetanus,
- 2.2. gas gangrene,
- 2.3 hospital infection,
- 2.4. cross-infection with modes of spread and prevention,
- 2.5. General survey of chronic inflammations,
- 2.6. Syphilis (reference to other venereal diseases) leprosy,
- 2.7. Actinomycosis.

3. General survey of trauma, pathology and clinical features of wound repair:

- 3.1. General survey of trauma, pathology and clinical features of wound repair: primary, secondary and Tertiary wound healing, clean wounds, contaminated wounds and infectious wounds,
- 3.2. Principles of treatment, survey of factors affecting wound healing,
- 3.3 Ulcers and gangrene,

3.4. Post-operative complications of abdominal surgery specifically chest, wound infection, oedema.

4. Burns as a specific type of severe trauma:

classification, early and late complications, management & reconstructive surgery - skin grafting as an Example of the plastic procedure.

5. Types of skin grafting Types of skin grafting:

Types of grafting - healing of grafting, Postoperative care of plastic surgery with the specific role of physiotherapy.

6. Outline of surgical disorders of brain-head injuries:

A general survey of surgical disorders of the spine and spinal cord problem of paraplegia, malignancy Spread and its behaviour, various abdominal incisions, abdominal drainage tubes, catheters and Nasogastric tubes, ward demonstration for an hour a day for one week.

7. Anaesthesia, O.T. demonstrations.

Neck, skin contractures and correction. Neck, skin contractures and correction.

Problems of trauma to hand and their management.

8. Principles of cineplasty:

Principles of tendon transplant, cosmetic surgery types of grafts, surgery of hands with emphasis on Management of traumatic and leprosy hand.

9. Chest injury:

Common surgeries of the chest Common surgeries of the chest:

9.1. Thoracoplasty,

9.2. Pulmonary dissections,

9.3. Thoracotomy,

9.4. Pneumothorax,

9.5 Hydrothorax Pneumothorax,

9.6. Empyema.

10. Common diseases of the oesophagus and related conditions causing dysphagia:

- 10.1. Cholecystectomy,
- 10.2 Colostomy,
- 10.3 Ileostomy,
- 10.4. Gastrectomy,
- 10.5. Hernias,
- 10.6. Appendectomy,
- 10.7. Mastectomy,
- 10.8. Nephrectomy,
- 10.9. Prostatectomy.
- 10.10 Surgery of portal hypertension.
- 10.11 Surgery of heart and great vessels.

11. Basic principles of open-heart Surgery:

- 11.1. Heart-lung bypass (Extra Co-portal circulation)
- 11.2. Basic principles of open-heart Surgery, Heart-lung bypass.

12. Common vascular surgery Common vascular surgery:

- 12.1. Embolectomy,
- 12.2. Vascular reconstructive surgery, (Thrombosis, Embolism, atherosclerotic and Occlusive vascular diseases including coronary artery bypass).

13. OBSTETRICS AND GYNAECOLOGY:

- 13.1. Anatomy and physiology of the female reproductive organs. Puberty dynamics
- 13.2. Physiology of menstrual cycle – ovulation cycle, uterine cycle, Cx cycle, duration.
- 13.3. Hormonal regulation of menstruation
- 13.4. Diagnosis of pregnancy
- 13.5. Abortion
- 13.6. Physiological changes during pregnancy
- 13.7. Importance of antenatal care exercise

- 13.8. High risk pregnancy, prenatal common complications – investigation and management
- 13.9. Musculoskeletal disorders during pregnancy
- 13.10. Multiple child birth
- 13.11. Normal labor.
- 13.12. Child birth complications, investigation and management
- 13.12 Normal puerperium, lactation and importance of post-natal exercises
- 13.14. Family planning.
- 13.15. Medical termination of pregnancy.

Reference Books:

1. Russell RCG, Williams NS, Bulstrode CJK: Bailey & Love's short practice of surgery.
2. Mowschenson PM: Aids to undergraduate surgery.
3. Farquharson M & Moran B: Farquharson's textbook of operative general surgery.
4. Lumley JSP: Hamilton Bailey's demonstrations of physical signs in clinical surgery.
5. Doherty MG: Current surgical diagnosis and treatment. S. Das: A concise textbook of surgery.
6. S. Das: A manual on clinical surgery.
7. Dutta DC: Text book of obstetrics / Textbook of gynaecology.
8. Bhargava KB, Bhargava SK & Shah TM: A short textbook of E.N.T diseases.
9. Physiotherapy in Obstetrics and Gynaecology, Margaret Polden.
10. DC Dutta's textbook of Gynaecology.

ORTHOPEDECS

Teaching Hours: 80 hours.

Maximum Marks: 100 (Theory: 100)

Assessment: Written, Internal and University examinations.

Internal Examination: 30 marks Theory

University Examination: 70 marks Theory

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 orthopaedic conditions
4. Correlate the radiological findings with clinical findings

1. General Orthopaedics

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

Deformities, acquired deformities, causes and principles of management

Splinting.

Traction procedures – materials.

Preventive orthopaedics.

Geriatric orthopaedics.

TRAUMATOLOGY

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

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

3. Injuries to the hand:

- 3.1. Types (open, closed),
- 3.2. Principles of treatment, injuries to the phalanges,
- 3.3. sprains, dislocations of MP and IP joints,
- 3.4. Fractures of the phalanges,
- 3.5. MCPs Bennett's fracture,
- 3.6. Mallet finger, tendon injuries (flexor and extensors)

4. Wrist and forearm injuries:

- 4.1. Wrist dislocation,
- 4.2. Colles' fracture,
- 4.3. Displaced epiphysis,
- 4.4. Smith fracture,
- 4.5. Barton fracture,
- 4.6. Injuries to carpal,
- 4.7. Scaphoid and sprains;
- 4.8. fracture of forearm bones-Greenstick fracture,
- 4.9. Infracoracoid injury,
- 4.10. Both bone fracture, Galeazzi, Monteggia fracture

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

6. Fractures involving the elbow joint:

- 6.1. Supracondylar fracture,

- 6.2. Intercondylar fracture,
- 6.3. Fracture of medial epicondyle and lateral epicondyle,
- 6.4. Myositis ossificans,
- 6.5. VIC,
- 6.6. Fracture of head of radius and olecranon.

7. Injuries of shoulder and arm:

- 7.1. Fracture of proximal end,
- 7.2. Neck, shaft of humerus,
- 7.3. Fractures of clavicle,
- 7.4. Acromioclavicular and sternoclavicular dislocations,
- 7.5. Fractures of scapula.

8. Injuries of spine and pelvis:

- 8.1. Injuries to the cervical spine (upper and lower),
- 8.2. Atlantoaxial injuries,

9. Dorsolumbar spine:

Classification, mechanism and types of injuries, stable fracture without paraplegia, fracture dislocation with paraplegia; management of fracture and paraplegia, bedsores and bladder/bowel.

9. Pelvic injuries:

- 9.1. Fractures, its mechanism,
- 9.2. Classification and management;
- 9.3. Fractures of acetabulum,
- 9.4. Sacrum and coccyx.

10. Injuries of the lower limb:

- 10.1. Dislocations of hip joint,
- 10.2. Intracapsular and trochanteric fractures of femur,
- 10.3. Fractures of the neck of femur,

10.4 shaft of femur and fracture femur in children.

10.4 Fracture of femoral and tibial condyles and patella,

10.5. Injuries to extensor mechanism, contusion,

10.6. Hemarthrosis, knee joint dislocation and traumatic dislocation of patella.

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

11. Foot:

11.1 Fracture of talus,

11.2. Calcaneum, MTs and phalanges

12. Soft tissue injuries:

12.1. Ligamentous injuries of ankle and injury to muscles

13. Amputations:

Types, ideal stump, complications, general principles of treatment, Upper and lower extremity amputations – prosthesis.

14. Orthopaedic splints and appliances for injuries to muscles and tendons

Principles of operative management, indications and contraindications for

14.1. Arthroplasty,

14.2. Osteotomy,

14.3. Arthrodesis,

14.3. Spinal stabilization,

14.4. Tendon operations,

14.5. Arthroscopy,

14.6. total and partial joint replacements,

14.7. Limb re attachments.

NON-TRAUMATOLOGY

1. Congenital disorders:

- 1.1. Congenital deformities,
- 1.2. Congenital elevation of scapula,
- 1.3. Torticollis,
- 1.4. Cleidocranial dysostosis,
- 1.5. Superior radioulnar joint dislocation,
- 1.6. Madelung's deformity,
- 1.7. SCM tumour,
- 1.8. Congenital wry neck,
- 1.9. Kyphosis,
- 1.10 Lordosis,
- 1.11 Scoliosis – primary and secondary,
- 1.12. Spina bifida,
- 1.13 Meningocele
- 1.14 Coxa vara
- 1.15 CDH,
- 1.16 Congenital genu recurvatum,
- 1.17. CTEV.

2. Infections of bone and joints:

- 2.1 Osteomyelitis: acute and chronic.
- 2.2. Brody's abscess (as a complication of open fracture),
- 2.3. Skeletal T.B., principles of treatment T.B. of shoulder, elbow and wrist, hip, knee, ankle and foot;
- 2.4 T.B. Osteomyelitis: Dactylitis, Caries rib.

3. Arthritis:

- 3.1. Acute pyogenic arthritis,
- 3.2. Septic arthritis of infancy,
- 3.3. Small pox arthritis,

3.4. Syphilis infection of joint R.A., O.A.

4. Bone Tumours:

4.1 Classification, true bone tumors

4.2 osteosarcoma,

4.3. giant cell tumor,

4.4. Ewing's sarcoma,

4.5. Chondroblastoma,

4.6 chondrosarcoma,

4.7. fibrosarcoma,

4.8. lymphoma of bone,

4.9. plasmacytoma.

4.10. Bone metastasis: synovial sarcoma,

4.11. Haemangioma of bone, adamantinoma of long bones and chondroma.

4.12. Tumor like lesions: osteoma, benign osteoblastoma, nonosteogenic fibroma, osteochondroma,

4.13. osteoid osteoma and enchondroma .

5. Regional conditions of spine and lower limb:

5.1. Backache

5.2. Kyphosis,

5.3. Scoliosis,

5.4. Spondylolisthesis,

5.5. Lumbosacral strain,

5.6. PIVD,

5.7 fibrositis back,

5.8. Lumber canal stenosis,

5.9. Sacroiliac strain,

5.10. Spondylosis,

5.11. Spondylolysis

6. Hip:

6.1. Coxa Vera,

6.2. slipped upper femoral epiphysis,

6.3. Idiopathic chondrolysis of hip

7. Knee:

7.1. Genu valgum & varum, recurvatum,

7.2. Tibia vara,

7.3. Quadriceps fibrosis,

7.4. Recurrent dislocation of patella,

7.5. Bursa around the knee,

7.6 loose bodies in the knee,

7.7. CMP

8. Foot:

8.1. Painful heel,

8.2. Plantar fasciitis,

8.3. Posterior heel pain,

8.4. Flat foot, foot strain,

8.5. Pain in forefoot,

8.6. Hallux valgus,

8.7. Anterior metatarsalgia.

Regional conditions of neck and upper limb–

9. Neck:

9.1. Cervical Spondylosis.

9.2. PIVD,

9.3. Cervical rib,

9.4. Torticollis,

9.5. Brachialgia

10. Shoulder:

10.1. Supraspinatus tendonitis,

10.2. Calcification,

10.3 rupture of rotator cuff,

10.4. Adhesive capsulitis,

10.5 deltoid fibrosis,

10.6 Subarachnoid bursitis,

10.7 bicipital tendonitis

11. Elbow:

11.1 Tennis elbow,

11.2 golfer's elbow,

11.3 recurrent slipping of ulnar nerve,

11.4 Cubitus Varus and Valgus

12. Wrist and hand:

12.1. Ganglion,

12.2. D.Q.

12.3 Trigger finger and thumb,

12.4 Carpal tunnel syndrome,

12.5 Dupuytren's contracture

13. Miscellaneous:

13.1 Backache,

13.2 disc lesions,

13.3 metabolic diseases,

13.4 rickets,

13.5 Osteomalacia,

13.6 osteoporosis,

13.7 parathyroid osteodystrophy,

13.8. Scurvy, tenosynovitis etc.

SUGGESTED READINGS (LATEST EDISION)

1. Essential Orthopaedics- Maheswari.
2. Essential orthopaedics for physiotherapist, -John Ebenezer.
3. Clinical orthopaedic Rehabilitation.

PHYSICAL AND FUNCTIONAL DIAGNOSIS

Teaching Hours: 80 hours (Theory: 80 hours and Practical: 80hours)

Maximum Marks: 200 (Theory: 100 and Practical and viva-voce: 100)

Assessment: Written, Oral and Practical, Internal and University examinations

Internal Examination: 30 marks Theory and 30 marks Practical

University Examination: 70 marks Theory, 70 marks Practical and Viva – voce

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. INTRODUCTION OF PHYSICAL AND FUNCTIONAL DIAGNOSIS

- 1.1 Diagnosis and its importance in clinical practice
- 1.2 Introduction to screening for referral in physical therapy
- 1.3 Physical assessment as a screening tool
- 1.4 Use of ICF for various Physiotherapy related conditions, Impairment, Activity Limitation and Participation Restriction, Personal & Environmental Factors.

2. CARDIO-PULMONARY SYSTEM & FITNESS

General Cardio vascular Assessment

- 2.1. Examination & Palpation: Head, Neck, Chest and Extremities
- 2.2. Measurements: Chest Expansion, symmetry of chest movement Auscultation: Normal and Abnormal Breath Sounds, Special tests: Breath Holding Test etc.
- 2.3. Measuring Pulse, Arterial Blood Pressure, Respiration, Percussion,
- 2.4. Dyspnoea scale (NYHA and Borg scale for rating of perceived exertion RPE)
- 2.5. Vital Parameters,
- 2.6. 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.
- 2.8. X-ray Chest, ABG, PFT, ECG (Normal & variations in common pathologic conditions).

3. MUSCULOSKELETAL SYSTEM

- 3.1. Patient History,
- 3.2. Observation,
- 3.3 Inspection,
- 3.4 Palpation,
- 3.5. Range of Motion,
- 3.6. End Feels,
- 3.7. Accessory Joint Motions,

- 3.8. Muscle strength, Power,
- 3.9. Endurance,
- 3.10. Flexibility,
- 3.11. Limb-length discrepancy,
- 3.12. Limb girth,
- 3.13. Pelvic inclination,
- 3.14. Trick movements,
- 3.15 Special Tests For all joints & spine.
- 3.16 Altered Posture & Gait –Functional analysis as per I.C.F norms.
- 3.17. Physical examination of joints in normal and patho – mechanical conditions

4. NERVOUS SYSTEM

- 4.1. General neurological examination,
- 4.2. Higher functions,
- 4.3. Cranial nerves,
- 4.4. Altered muscle strength,
- 4.5. Power, Balance, Endurance,
- 4.6. Tone, Spasticity,
- 4.7. Inco-ordination,
- 4.8. Abnormal deep & superficial reflexes,
- 4.9. Myotomes,
- 4.10. Dermatomes,
- 4.11. Voluntary control testing,
- 4.12. Abnormal movements,
- 4.13. Neural control of bladder,
- 4.14. Nerve entrapments,
- 4.15. Gait and Functional evaluation as per ICF norms.

5. Sensory Integrity,

- 5.1. Pattern of Sensory Impairment,
- 5.2. Screening, Superficial Sensations, Deep Sensations, Combined Cortical Sensations,
- 5.3. Quantitative Sensory Testing, Cranial Nerve Testing.

6. Gross motor movements –

- 6.1. Body Posture, Balance (Non equilibrium and Equilibrium) tests,
- 6.2. Fine motor movements.

7. Scales-

- 7.1. Ashworth,
- 7.2. Glasgow Coma,

7.3. MMSE.

8. ELECTRO-DIAGNOSIS

Electro-diagnosis:

8.1. Bioelectricity - Physiology of generation & propagation of action potential –Volume conduction:

8.2. 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.

8.3. Principles of Electromyography – Motor unit – Normal characteristics – Activity at rest, Recruitment/frequency pattern at minimal activity, Interference pattern – Abnormal E.M.G. pattern.

8.4. Electro-diagnostic (EMG, NCV, SDC etc.) findings.

8.5. Principles of nerve conduction.

8.6. Late responses: F-wave, H-reflex.

8.7. Electro-physiological principles of assessment of myoneural junction.

8.9. E.M.G Instrumentation: Basic Components, Panel diagram, Types of electrodes.

9. SD Curve Test

9.1. Definition Type of current used, shape, frequency.

9.2. Procedure

9.3. Advantage, Disadvantage

9.4. Characteristic of curve (Normal, Partial, Complete denervation).

9.5. Factors that affect accuracy of SD curve, FG test,

9.6. Nerve conduction velocity,

9.7. Neuromuscular Electrical Stimulator.

10. Biofeedback:

10.1. Introduction,

10.2. Principles of biofeedback,

10.3. Types of Bio feedback.

10.4. Therapeutic effects, Indications,

10.5. Contraindications and Techniques of treatment.

11. ASSESSMENT OF HAND

11.1. Sensations

11.2. Mobility of joints

11.3. Strength

11.4. Special Tests for hand

11.5. Hand Function – Precision and Power grips

12. FUNCTIONAL DIAGNOSIS:

- 12.1 ICF,
- 12.2 FIM,
- 12.3 STREAM,
- 12.4. Barthel Index
- 12.5. HRQoL – SF36.

13. Posture and alignment:

- 13.1. Biomechanical and neural factors.
- 13.2. Methods of Assessment of the Posture – Sitting /standing
- 13.3. Methods of assessment – Sagittal & frontal plane with plumb line & postural frame,
- 13.4. Spondylometer.

14. ASSESSMENT OF PAIN:

- 14.1. Intensity,
- 14.2. Quality,
- 14.3 Objective assessment,
- 14.4 Documentation.
- 14.5 VAS,
- 14.6 Mc Gill’s questionnaire,
- 14.7. NPRS,
- 14.8 Body Diagram.

15. ASSESSMENT OF OBESITY

- 15.1 Pathophysiology
- 15.2. Assessment of obesity
- 15.3. BMI,
- 15.4. Waist Hip Ratio,
- 15.5. Skin fold measurement,
- 15.6. Anthropometric measurements,
- 15.7. Newer Methods,

16. FITNESS & SPORTS ASSESMENT

- 16.1. Assessment of Fitness-Flexibility,
- 16.2 Endurance and Agility.
- 16.3. Energy Systems
- 16.4. Activity Specific and Heath Related Fitness

16.5. Tests Used For Fitness Testing-

Test For

1. Aerobic Endurance
2. Muscular Endurance
3. Muscular Strength
4. Flexibility
5. Body Composition
6. Speed
7. Power
8. Balance
9. Reaction Time
10. Agility

16.6. Sports Specific Test- Balance, Agility.

16.7. Senior Fitness Test.

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											
COURSE CODE	COURSE TITLE	TEACHING SCHEME				Credit	EXAMINATION SCHEME				
		Contact hours			Total		Theory		Practical		Total
		Theory	Practical	Total			Internal	External	Internal	External	
PT0401	Physiotherapy In Orthopaedic Conditions	120	120	240	9	30	70	30	70	200	
PT0402	Physiotherapy in Neurological conditions	120	120	240	9	30	70	30	70	200	
PT0403	Physiotherapy in Cardiovascular & Pulmonary conditions	120	120	240	9	30	70	30	70	200	
PT0404	Physiotherapy In General Medicine and Surgery .	120	120	240	9	30	70	30	70	200	
PT0405	Physiotherapy In Community Health and Rehabilitation	120	80	200	8	30	70	30	70	200	
PT0406	Research Methodology & Biostatistics	60	—	60	3	10	40	--	--	50	
PT0407	Project Work orientation		120	120	3	-	-				

PT0408	Clinical Education		720	720	18					
PT0409	Entrepreneurship in Physiotherapy (Not for University Examinations)	40	---	40	2					
Total Hours				1980	67					

SYLLABUS CONTENTS OF FINAL.Y.B.P. T

FINAL YEAR B. PHYSIOTHERAPY

PHYSIOTHERAPY IN ORTHOPAEDIC CONDITIONS

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours)

Maximum Marks: 200 (Theory: 100 and Practical and viva-voce: 100)

Assessment: Written, Oral and Practical, Internal and University examinations

Internal Examination: 30 marks Theory and 30 marks Practical

University Examination: 70 marks Theory, 70 marks Practical and Viva – voce.

Objectives:

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

1. Identify, discuss and analyse 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.

Syllabus:

1. GENERAL ASSESSMENT FOR MUSCULOSKELETAL CONDITIONS

Patient history, observation, inspection, palpation, pain, range of motion, end feels, accessory joint motions, and manual muscle testing, special tests for differentiating diagnosis.

2. PHYSIOTHERAPY MANAGEMENT FOR FRACTURES & DISLOCATION

UPPER LIMB FRACTURES:

- 2.1. Fractures of clavicle,
- 2.2. Scapula,
- 2.3. Greater tuberosity and Neck of humerus
- 2.4. Shaft of humerus,
- 2.5. Supracondylar fracture of humerus,
- 2.6. Fractures of capitulum, radial head,
- 2.7. Olecranon, coronoid, and epicondyles,
- 2.8. Side swipe injury of elbow,
- 2.9. Both bone fractures of ulna and radius,
- 2.10. Fracture of forearm – Monteggia,
- 2.11. Galeazzi fracture – dislocation, Chauffeur's fracture,
- 2.12. Colle's fracture, Smith's fracture.
- 2.13. Scaphoid fracture,
- 2.14. Fracture of the metacarpals,
- 2.15. Bennett's fracture,
- 2.16. Fracture of the phalanges.

3. DISLOCATIONS OF UPPER LIMB:

- 3.1. Anterior dislocation of shoulder,
- 3.2. Recurrent dislocation of shoulder,
- 3.3. Posterior dislocation of shoulder,
- 3.4. Posterior dislocation of elbow.

4. FRACTURE OF SPINE:

- 4.1. Fracture of Cervical Spine,
- 4.2. Clay shoveller's fracture,
- 4.3. Hangman's fracture,
- 4.4. Fracture odontoid,
- 4.5. Fracture of atlas,
- 4.6. Fracture of Thoracic and Lumbar Regions,
- 4.7. Fracture of coccyx,
- 4.8. Compression fracture.

4.8. Fracture of Rib Cage - Mechanism of injury, clinical features, management for Fracture Ribs,

4.9. Fracture of sternum.

5. LOWER LIMB FRACTURES:

5.1. Fracture of pelvis, Neck of femur,

5.2. Shaft femur,

5.3. Supracondylar fracture of femur,

5.4. Condyles of femur,

5.5. Patella,

5.6. Tibial condyles,

5.7. Both bones fracture of tibia and fibula,

5.8. Dupuytren's fracture,

5.9. Maisonneuve's fracture,

5.10. Pott's fracture,

5.11. Bimalleolar fracture,

5.12. Trimalleolar,

5.13. Calcaneus,

5.14. Talus,

5.15 Metatarsals,

5.16. Stress fracture,

5.17. Jone's fracture,

5.18. Fracture of phalanges.

Green stick fracture management.

6. DISLOCATIONS OF LOWER LIMB:

6.1. Anterior dislocation of hip,

6.2. Posterior dislocation of hip,

6.3. Central dislocation of hip,

6.4. Dislocation of patella,

6.5. Recurrent dislocation of patella.

7. PHYSIOTHERAPY MANAGEMENT FOR ARTHROPLASTY:

Outline the Pre and Post-Operative Physiotherapy assessment and management for the following conditions:

7.1. Hemi arthroplasty,

- 7.2 Excision arthroplasty,
- 7.3. Shoulder Arthroplasty, Total hip replacement,
- 7.4 Total knee replacement,
- 7.5. McMurray's Osteotomy,
- 7.6. Reconstructive surgery.
- 7.7. Tendon transfers

8. PHYSIOTHERAPY MANAGEMENT FOR AMPUTATIONS

OUTLINE THE PRE AND POST-OPERATIVE PHYSIOTHERAPY ASSESSMENT AND MANAGEMENT FOR THE FOLLOWING CONDITIONS:

- 8.1. Amputations – Upper limb & Lower limb.
- 8.2. Orthosis & Prosthesis.

9. PHYSIOTHERAPY MANAGEMENT FOR INFLAMMATORY & DEGENERATIVE CONDITIONS:

Outline The Physiotherapy Assessment and Management for The Following Conditions:

- 9.1. Osteoarthritis,
- 9.2. Rheumatoid arthritis,
- 9.3. Ankylosing spondylitis,
- 9.4. Gouty arthritis,
- 9.5. Psoriatic arthritis,
- 9.6 Haemophilic arthritis,
- 9.7. Still's disease,
- 9.8. Charcot's joints.
- 9.9. Prolapsed intervertebral disc (PID),
- 9.10 Spinal Canal Stenosis,
- 9.11. Spondylosis (cervical and lumbar),
- 9.12. Spondylolysis,
- 9.13. Spondylolisthesis,
- 9.14. Lumbago/ Lumbosacral strain.

10. CONNECTIVE TISSUE DISORDERS:

- 10.1. Systemic Lupus Erythematosus,
- 10.2. Scleroderma,
- 10.3. Dermatomyositis.

11. PHYSIOTHERAPY MANAGEMENT FOR INFECTIVE CONDITIONS & TUMOURS:

Outline The Physiotherapy Assessment and Management for The Following Conditions:

Infective conditions:

11.1 Osteomyelitis,

11.2 TB spine and major joints like shoulder, hip, knee, ankle, elbow etc.

11.3 Arthritic conditions:

11.4 Pyogenic arthritis,

12. BONE TUMOURS:

12.1 Osteoma,

12.2 Osteosarcoma,

12.3 Osteochondroma,

12.4 Enchondroma,

12.5 Ewing's sarcoma,

12.6 Giant cell tumor,

12.7 Multiple myeloma,

12.8 Metastatic tumours.

12.9 Perthe's disease,

12.10 Slipped Capital Femoral Epiphysis and Avascular Necrosis.

13. METABOLIC BONE DISEASES:

13.1 Rickets,

13.2 Osteomalacia,

13.3 Osteopenia,

13.4 Osteoporosis.

13.5. Pagets Disease.

13.6. Osteogenesis Imperfecta.

14. PHYSIOTHERAPY MANAGEMENT FOR DEFORMITIES:

Outline the Physiotherapy assessment and management for the following conditions:

14.1 CONGENITAL DEFORMITIES – CTEV, CDH, Torticollis, Scoliosis, Flat foot, Vertical talus, Hand anomalies- syndactyly, polydactyly and ectrodactyly, Arthrogryposis multiplex Congenita (amyoplasia congenita), Limb deficiencies- Amelia and Phocomelia, Klippel feil syndrome. Osteogenesis imperfecta (fragile ossium), cervical rib.

14.2 ACQUIRED DEFORMITIES - Acquired Torticollis, Scoliosis, Kyphosis, Lordosis, Genu varum, Genu valgum, Genu recurvatum, Coxavara, Pes Cavus, Hallux rigidus, Hallux valgus, Hammer toe, Metatarsalgia.

15. PHYSIOTHERAPY MANAGEMENT FOR SOFT TISSUE INJURIES:

Outline the Physiotherapy assessment and management for the following conditions:

Sprains, Strains, Contusion, Tendinitis, Rupture, Tenosynovitis, Bursitis.

16. SPORTS MEDICINE/REHABILITATION:

Principles of Sports Rehabilitation:

16.1 Sporting emergencies & first aid

16.2 Cardio pulmonary Resuscitation, Shock management, Internal and external bleeding, Splinting,

16.3 Stretcher use–Handling and transfer.

16.4 Management of Cardiac arrest, acute asthma, epilepsy, drowning, burn.

16.5 Pre-participation Examination

16.6 Management of Sporting Emergencies

16.7 Approach to on-field Concussion, ABCs approach, Medical Cover for Sports events, Ergogenic aids.

16.8 Initial management of Acute sports injuries

16.9 Return to Sports decision making criteria for common contact and non-contact sports like running, swimming, football, basketball.

16.10 Management of overuse injuries in sports: Electrophysiological Agents, Therapeutic and Prophylactic Strategies, Taping, Wrapping and Bandaging

SUGGESTED READINGS

RECOMMENDED STUDY MATERIAL:

TEXTBOOKS:

1. Orthopaedics Physical Assessment by David J. Magee, 6th Edition.

2. Textbook of orthopaedics- Cash.
3. Rehabilitation for the postsurgical orthopaedic patient by Lisa Maxey.
4. Management of Common Musculoskeletal Disorders Physical Therapy Principles and Methods by Darlene Hertling & Randolph M. Kessler, 4th edition.

REFERENCE BOOKS:

1. Clinical Orthopaedic Rehabilitation by S. Brent Brotzman & Kevin E. Wilk, 2nd edition.
2. Postural Disorders & Musculoskeletal Dysfunction Diagnosis, Prevention and Treatment by Gill Solberg.
3. Physical Rehabilitation Assessment and Treatment – O’Sullivan Schmitz.
4. Apley's System of Orthopaedics and Fractures by Louis Soloman, David Warwick, Selvadurai Nayagam, 9th Edition.
5. Adams's Outline of Fractures, Including Joint Injuries, 12th Edition.
6. Turek's Orthopaedics: Principles and Their Application by Stuart L. Weinstein & Joseph A. Buckwalter, 6th Edition.
7. Orthopaedic Physical Therapy by Robert A. Donatelli & Michael J. Wooden, 4th edition.

PHYSIOTHERAPY IN NEUROLOGICAL CONDITIONS

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours).

Maximum Marks: 200 (Theory: 100 and Practical and viva-voce: 100).

Assessment: Written, Oral and Practical, Internal and University examination.

Internal Examination: 30 marks Theory and 30-marks Practical.

University Examination: 70 marks Theory, and 70 marks Practical and Viva – voce

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:

1. PRINCIPLES OF EXAMINATION:

1.1 Art of history taking and patient communication.

Standardized examination tools commonly used in patients with neurological disability:

Screening for cognitive functions: Glasgow Coma Scale, Cognitive status:

1.2 Mini Mental State Examination.

1.3 Sensory motor functions: Fugl-Meyer Scale, NIH Stroke scale

1.4. Motor development: Gross Motor Function Measure (GMFM), Gross Motors Classification System (GMFCS),

1.5. Alberta Infant Motor Scale.

1.6. Muscle strength: Manual Muscle Testing, motricity index, Dynamometry.

1.7. Muscle tone: Ashworth Scale, Tardieu Scale, Pendulum Test, H reflex.

1.8. Balance: Berg Balance Scale, Performance oriented Mobility Assessment, timed up and go test.

1.9. Gait: Observational gait Analysis, Dynamic Gait Index.

1.10 Functional status: Barthel Index, Functional Independence Measure, frenchay activities index and stroke impact scale, modified Rankin scale.

1.11. Electro-diagnostic (EMG, NCV, SDC etc.) findings.

2. PRINCIPLES OF TREATMENT:

2.1 Motor Control: What is motor control? Overview of Motor control theories:

Reflex -Hierarchical theory and Dynamic systems theory.

2.2 Motor development: What is motor development? Overview of theories of motor development:
Neuro maturational theory and Dynamic systems theory.

2.3 Motor Learning:

What is motor learning? Overview of Motor learning theories.

3. APPROACHES IN NEURO-PHYSIOTHERAPY:

Explain the history, principles of treatment, techniques, and clinical effectiveness with research support of the following approaches: Bobath's approach (NDT), Rood's Approach, Proprioceptive Neuromuscular Facilitation (PNF), Brunnstorm's approach, Motor Relearning Program, Task oriented and functional activity base approach.

MANAGEMENT OF ADULT NEUROLOGICAL CONDITIONS:

4. BRAIN

Application of previously learned knowledge of principles of examination and treatment, approaches and models of disability into the management of following conditions:

- 4.1. Stroke:** Acute care including prevention and management of complications, Strength and endurance training, management of functional limitations in sit to stand, walking, upper limb functions, self-care, domestic life and social participation.
- 4.2. Traumatic brain injury:** Coma stimulation program, Prevention and management of complications, Functional Training, Cognitive training.
- 4.3 Parkinson's disease:** Strength, flexibility and endurance training, Locomotion training Fall prevention, Relaxation Exercises, Use of External cues in the management of Parkinson's disease.
- 4.4 Assessment and Treatment Techniques:** Head injury, Brain tumours.
- 4.5. Cerebellar Ataxia:** Management of Ataxia, Balance and Coordination training, Functional training
- 4.6 Motor Neuron Disease:** Management of Spasticity, contracture and pain, Strength and endurance training, Functional Training.

SPINAL CORD,

4.2. Spinal cord Lesions: Acute care, Management of complications (Orthostatic hypotension, Autonomic Dysreflexia, Decubitus ulcer contractures etc.), Ambulation and transfer training, activities of daily living management, wheelchair and orthosis prescription.

Quadriplegia, Paraplegia, Monoplegia, cauda Equina, Pott's spine, Brown sequard syndrome, Tabes dorsalis. Transverse myelitis.

4.6 Multiple Sclerosis: Management of Spasticity, pain and fatigue, Balance and coordination training, Functional training, Cognitive training.

4.11. Peripheral Nerve Lesions:

4.10 Peripheral Neuropathy (including mono and poly neuropathy conditions involving upper limb, lower limb and cranial nerves: Prevention and management of complications), Muscle Re-education, Strength training, Sensory training, Prescription of orthosis, Functional Training.

Erb's Palsy, Klumpke's palsy, Axillary nerve palsy, Thoracic inlet syndrome, Bell's palsy, causalgia, Nerve trunk and root injuries.

Leprosy-operations, transplantations, graphs, sutures and splints.

GBS, Diabetic and Alcoholic Neuropathy.

4.13. Management of Paediatric Neurological conditions:

Application of previously learned knowledge of principles of examination and treatment, approaches and models of disability into the management of following conditions:

4.15 Cerebral Palsy: Early intervention, Functional training, Parental education, Strength training, physical fitness training.

4.16 Down Syndrome: Early intervention, Functional training, Parental education, Strength training, physical fitness training.

4.17. Children with Multiple Disabilities: Early intervention, Parental education Functional training, prescription of assistive devices, self-care activity training.

4.18. Brachial Plexus Injuries: Prevention and management of complications, Strength training, Sensory training, Prescription of orthosis, Functional training.

4.19. Spina Bifida and Hydrocephalus. Prevention and management of complications, Ambulation and transfer training, Wheel chair and orthosis prescription, Parental Education, Functional training.

4.10. Muscular Dystrophies.

4.11. DISORDERS OF MUSCLES AND NEUROMUSCULAR JUNCTION

Myasthenia Gravis & Myasthenia syndrome

MISCELLANEOUS.

4.74. Myopathy: Endurance Training, Transfer and Ambulation Training, Functional Training, Hydrotherapy, Orthosis and Wheel chair prescription.

4.12. Benign Paroxysmal Positional Vertigo (BPPV): Vestibular Rehabilitation: Epley maneuver, Semont maneuver, Brand- Daroff exercises, balance training.

4.13. Infections of Nervous System

Meningitis, Encephalitis, Neurosyphilis, Tabes dorsalis, Leprosy. Eaton Lambert Syndrome.

RECOMMENDED STUDY MATERIAL:

TEXTBOOKS:

1. Physical Rehabilitation by Susan B. O'Sullivan and Thomas J. Schmitz, 5th Edition.
2. Neurological rehabilitation: optimizing motor performance by Janet H. Carr and Roberta B. Shepherd.
3. Physical therapy for children by Suzann K. Campbell, Robert J. Palisano, Darl W. Vander Linden, 5th edition.

REFERENCE BOOKS:

1. Movement Science: Foundations for physical therapy in rehabilitation by Janet H. Carr and Roberta B. Shepherd.
2. Motor Control: Theory and practical applications by Anne Shumway-Cook, Marjorie H. Woollacott, 3rd edition.

PHYSIOTHERAPY IN CARDIO VASCULAR & PULMONARY CONDITIONS

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours).

Maximum Marks: 200 (Theory: 100 and Practical & Viva - voce 100)

Assessment: Written, Oral and Practical, Internal and University examination.

Internal Examination: 30 marks Theory and 30-mark Practical.

University Examination: 70 marks Theory, and 70 marks Practical and Viva – voce

Objectives:

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

1. Identify, discuss and analyse 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, restorative and rehabilitative measures for maximum possible functional independence of patient at home, work and in community.
7. Acquire the skill of basic CPR.

1. Basic review of Anatomy & Physiology:

- 1.1. Cardiorespiratory anatomy and physiology.
- 1.2. Mechanism of normal respiration.

2. Cardio Pulmonary evaluation:

- 2.1. Skill to palpate all pulses, rhythm, rate, volume and heart rate / pulse rate disc.

2.2 Skill to assess Blood pressure at various sites and its physiological variation

2.3 Skill of exercise testing:6/12 min. walk, Symptom limited.

3. Interpretation of:

3.1. Treadmill and ergo cycle test findings.

3.2. ECG

3.3 Basic laboratory data Interpretation.

3.4. Chest X ray.

3.5. P.F.T. – Obstructive / restrictive / reversibility.

3.6. A.B.G.

3.7. R.P.E – Borg's scale.

4. Principles & Techniques in chest physiotherapy:

Airway Clearance Techniques: Postural drainage, breathing exercise, Thoracic mobility exercises, PNF techniques of respiration, Chest clearance techniques- PEP, flutters, ACBT, autogenic drainage, cough-assisted techniques, Techniques of facilitations of accessory muscles, Mechanical Aids-Incentive, Spirometry, threshold IMT.

5. Cardiac & Pulmonary rehabilitation:

Indications and contraindications, exercise testing, exercise prescription and progression, monitoring and safety, patient education, outcome measures, the multidisciplinary team and the role of the physiotherapist, health promotion strategies relevant to the pulmonary and cardiovascular systems.

6. Physiotherapy assessment & management of cardiac disorders

6.1. Congestive cardiac failure

6.2. Myocardial Infarction

6.3. Endocarditis, myocarditis, pericarditis

6.4. Congenital & Acquired heart disease.

6.5. Valvular Heart diseases.

7. Physiotherapy Assessment & management of pulmonary disorders:

7.1 Chronic bronchitis

7.2 Emphysema

7.3. Asthma

7.4. Cystic fibrosis

7.5. Bronchiectasis, lung abscess pulmonary embolism

- 7.6. Pulmonary T.B., Pneumonia
- 7.7. Pleurisy
- 7.8. Empyema
- 7.9. Atelectasis
- 7.10 Pneumothorax and Broncho pulmonary fistula
- 7.11 Occupational lung disease
- 7.12 Chest trauma & Thoracic deformity.

8. Physiotherapy assessment & management of Vascular Disorders:

- 8.1. Thrombosis, phlebitis and thrombophlebitis
- 8.2. Varicose veins
- 8.3. DVT
- 8.4. Venous ulcers
- 8.5. Lymphedema.
- 8.6. Peripheral arterial disease.

9. Pre & post-operative assessment & management in cardiac surgery:

Pre and Post-operative physiotherapy following Open and Closed Heart Surgery- coronary artery bypass grafting, valve repair and valve replacement, corrective surgeries for congenital heart diseases, repair of aneurysms.

10. Pre & post-operative assessment & management in thoracic surgery:

- 10.1 Lobectomy
- 10.2 Pneumonectomy
- 10.3 Decortication
- 10.4. Thoracoplasty
- 10.5 Tracheostomy

11. Intensive & emergency care:

- 11.1 Evaluation, Monitoring and Principles of chest physiotherapy in I.C.U., I.C.C.U along with effect on cardiopulmonary system.

11.2 ICU Equipments- Airways And It's Extubation, Suctioning IABP, Pulse oximeter, nebulizers, humidifiers, O₂ therapy and Medical gas therapy, aerosol therapy (Indications, Contraindications, Hazards, Techniques/Methods, Types Etc..)

11.3 Mechanical ventilators- indications, classification, complications, modes, weaning criteria and method.

11.4 Emergency in Cardio Respiratory Conditions – CPR, Basic life support, Defibrillator, Resuscitation, Procedure.

11.5 Drugs used in ICU.

11.6 Brief about Neonatal and paediatric intensive care

RECOMMENDED STUDY MATERIAL:

TEXTBOOKS:

1. Cash's text book for Physiotherapists in Chest, Heart & Vascular diseases.
2. Cash's textbook in General Medicine & Surgical conditions for physiotherapists.
3. Physiotherapy for Respiratory and Cardiac problems by Jennifer A Pryor.
4. Tidy's physiotherapy.
5. Practical medicine: PJ Mehta

REFERENCE BOOKS:

1. Cardiopulmonary Physical Therapy by Irwin Scott.
2. Physiotherapy in respiratory care by Alexandra Hough.
3. Chest Physical therapy & pulmonary rehabilitation by Donna Frown filter.
4. ECG by P.J. Mehta.

PHYSIOTHERAPY IN GENERAL MEDICINE AND SURGERY.

Teaching Hours: 200 hours (Theory: 100 hours and Practical: 100hours).

Maximum Marks: 200 (200 h Theory: 100 and Practical & Viva - voce 100)

Assessment: Written, Oral and Practical, Internal and University examination.

Internal Examination: 30 marks Theory and 30-mark Practical.

University Examination: 70 marks Theory, and 70 marks Practical and Viva – voce

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 gynaecological 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. Abdominal Surgeries and Physiotherapy

- 1.1 Layers of abdominal wall
- 1.2. Abdominal quadrants
- 1.3. Types of Incisions and surgeries
- 1.4. Indications
- 1.5. Complications
- 1.6 Pre and post operative Physiotherapy Assessment and management for Appendicectomy, cholecystectomy, partial colectomy, ileostomy, hernia and herniotomy, hernioraphy, hernioplasty.

2. Burns and Physiotherapy

- 2.1. Skin anatomy and physiology
- 2.2 Types
- 2.3. Classification
- 2.4. Evaluation
- 2.5 Hypertrophic scars and keloids
- 2.6. Scar management
- 2.7. Splints in burns
- 2.8. Physiotherapy management for Burns Patients.

3. Wounds and Physiotherapy

- 3.1. Definition
- 3.2. Types and classification
- 3.3 Stages
- 3.4. Types of dressings
- 3.5 Evaluation and Physiotherapy management of Wounds.

4. Ulcers and Physiotherapy

- 4.1 Definition
- 4.2 Characteristics
- 4.3 Types
- 4.4 Evaluation
- 4.5 Decubitus ulcers-stages and grades
- 4.6 Diabetic foot and care
- 4.7. Anaesthetics hand and foot care
- 4.8. Arterial & venous ulcer.
- 4.9. Pressure sore.

5. Reconstruction surgeries and Physiotherapy

- 5.1 Principles
- 5.2. Indications
- 5.3. Skin grafts and flaps, Tendon transfer .
- 5.4 Implants in reconstructive surgeries

Pre and post-operative Physiotherapy Management

6. Surgeries in oncology and Physiotherapy

- 6.1 Introduction and common symptoms of cancer
- 6.2 Breast Cancer
- 6.3 Head and neck cancer
- 6.4. Lung Cancer
- 6.5 Oral cavity
- 6.6 Bone Cancer
- 6.7. Pre and post-surgical evaluation
- 6.8. Lymphedema managements
- 6.9. Palliative care
- 6.10. Common Physiotherapy approaches
- 6.11 Mastectomy – Simple, radical.

Pre and post-operative Physiotherapy Management.

8. Physiotherapy in Obstetrics and gynaecology.

- 8.1 Physiological changes during Pregnancy
- 8.2 Anatomy and physiology of female reproductive system
- 8.3 Physiotherapy management for Gynaecological conditions PCOS, Menopause, Dysmenorrhea, & infections.
- 8.4. Musculoskeletal and cardio-respiratory problems in pregnancy
- 8.5 Antenatal, perinatal and post-natal care.
- 8.6. Early Interventions, Handling of New Born.
- 8.7 Urinary incontinence
- 8.8. Prolapse uterus and rectum
- 8.9. Evaluation in obstetrics and gynaecology
- 8.10. Pre and post-operative Physiotherapy Management.

For obstetric surgeries. LSCS, Hysterectomy,

9. Miscellaneous

9.1. Physical rehabilitation in patient with obesity

9.2 Physical rehabilitation in patient with Endocrinal dysfunction & diabetes

9.3. Physiotherapy in skin conditions -acne vulgaris, leprosy, psoriasis, vitiligo, alopecia, hyperhidrosis

9.4. Physiotherapy in Covid 19.

10. Geriatric physiotherapy

10.1. Theories of Ageing.

10.2. Physiological changes of aging.

10.3. Assessment in geriatrics.

10.4. Role of physiotherapy: in geriatrics fitness (Institutionalized & Community dwelling elders), Half-way homes, Residential Homes, Meals on wheels, Home for the aged, etc.

Falls and its prevention in Geriatrics.

11. ENT – sinusitis, non suppurative and chronic suppurative otitis media, osteosclerosis, labyrinthitis, mastoidectomy, chronic rhinitis, laryngectomy, pharyngeal – laryngectomy, facial palsy.

12. Psychiatry – Physiotherapy in psychiatric conditions.

11. Physiotherapy for organ transplant

12. Pelvic floor assessment and management.

Suggested Readings

1. Text book of Gynaecology – by Dutta – New Central Book Agency.
2. Tidy's physiotherapy.
3. Physiotherapy in Obstetrics and Gynaecology – Poldon and Mantle
4. Cash JE & Downie P: Cash's textbook of general medical and surgical conditions for physiotherapists. Lippincott, Philadelphia, 1984.
5. Glenn Lrion: Comprehensive wound management. 2nd Ed, Slack Incorporated, USA, 2002.
6. Mantle J, Haslan J, Barton S: Physiotherapy in obstetrics and gynaecology. 2nd Ed, Butterworth Heinmann, UK, 2004.

PHYSIOTHERAPY IN COMMUNITY HEALTH AND REHABILITATION

Teaching Hours: 180 hours (Theory: 80 hours and Practical: 100hours)

Maximum Marks: 200 (Theory: 100 and Practical & Viva - voce 100)

Assessment: Written, Oral and Practical, Internal and University examination.

Internal Examination: 30 marks Theory and 30 marks Practical.

University Examination: 70 marks Theory, and 70 marks Practical and Viva – voce

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 polices – 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. Foundational concepts of rehabilitation.
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.

2 **CBR**

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 Paediatric 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 centres.
- 11 Extension services and mobile units.
- 12 Community awareness and participation in preventing aspects and demands PT services.
- 13 National district level rehab program

3. VOCATIONAL REHABILITATION

1. Introduction: Vocational Rehabilitation & assessment
2. Activities of hand, Disabled hand: Examination and Rehabilitation
3. Vocational Evaluation.
4. Role of Vocational Rehabilitation Team.

4. MOBILITY AIDS

1. 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
- Pre prosthetic and Prosthetic training

2. Orthoses:

- Purpose, types and biomedical principles
- Lower limb orthosis in detail: introduction to HKAFO Orthosis ,Foot Orthosis, Afo ,Kafo,Knee Orthosis, Hip Orthosis,
- Pathological gaits, biomechanics of lower limb orthotics, components, check out procedure and training with orthosis
- U.L. orthosis: introduction to wrist hand orthosis ,Shoulder Orthosis, Elbow 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: Cervical, Thoracic, Lumbar Sacral.

5. Disaster Management: -

Definition: Disaster preparedness, Disaster response and disaster recovery

1. Types of classification of Disasters
2. Stages of progress of Disasters
3. Role of physiotherapist in Disaster preparedness, response and disaster recovery.
- 4 National and international agencies providing support during disaster
- 5 Physiotherapist's role post disaster
- 6 Physiotherapist's role of psychological upliftment post disaster.

6. Occupational hazards, health promotion& Ergonomics.

1. Occupational hazards and health promotion

1. Introduction.
2. Objective & basic concepts of Occupational health.
3. Reorganization of health hazards.
4. Early detection of Occupational diseases.
5. Health education in the workplace.

2. Health Promotion in the community and at work place Health promotion strategies.

3. Ergonomics

1. Work capacity analysis role of physiotherapy industrial setup, job site disability, pre-employment screening, workers functional capacity assessment, work hardening programme industrial therapy.

2. Postural examination, job task analysis, educational programme for prevention of injury adult Education, documentation, analysis of functional hazards related to Environment / Industry.

7. Yoga

Principles of yoga, physiological effects, therapeutic effects, yogasans for various health conditions.

Reference Books:

1) Text book of Rehabilitation-Sunder.

- 2) Park Textbook of preventive and social Medicine.
- 3) Textbook of Community Medicine.
- 4) Therapeutic Exercise- Colby Kisner.
- 5) Orthotics & Prosthetics in Rehabilitation by Michelle .M.Lasordi.
- 6) Alternative therapies –Swathi bhagat.
- 7) Essentials of community Based rehabilitation- Satya Bhusan nagar.

RESEARCH METHODOLOGY & BIOSTATISTICS

Teaching Hours: 60 hours (Theory: 60 hours)

Maximum Marks: 50 (Theory: 50)

Assessment: Written, Internal and University examination.

Internal Examination: 10 marks Theory

University Examination: 40 marks Theory

Theory Contents

1. RESEARCH METHODOLOGY

1.1 Basic concepts

- Meaning and definition
- Research process
- Research types and approaches
- Objectives of research in physiotherapy
- Barriers for research in physiotherapy
- Research problem or research question

1.2 Research ethics

- Introduction
- Helsinki's declaration
- Plagiarism

1.3. Literature search

- Steps in literature search
- Purpose
- Methods and techniques

1.4. Research designs

- Meaning and definition
- Types of research designs
- Steps in preparation of research designs
- Factors affecting research designs

1.5. Sampling

- Principles
 - Methods
 - Designs
- Process

1.6. Research variables

- Introduction
- Types
- Reliability and validity
- Specificity and sensitivity.

1.7. Pilot study and pre-testing

- Need
- Advantages

1.8. Data collection

- Introduction
- Sources
- Methods
- Types

1.9. Research report

- Introduction
- Types
- Publication.
- Research Paper writing.

1.10. Evidence Based Practise

Introduction to evidence based practice

Definitions

Introduction evidence based practice.

2. Biostatistics

- Introduction of biostatistics (tabulation, graphical presentation)
- Measures of central tendency, variation, location, association and correlation for qualitative and quantitative data, bivariate distribution.
- Probability theory, normal, binomial and Poisson distributions
- Sampling methods and sample size estimation
- Simple regression analysis, Multivariate analysis; concepts and interpretation, Logistic regression analysis; concepts and interpretation
- Concepts in generalization of statistics computed from a sample and their utilities in research, including tests for significance.

Reference Books:

1. Methods in Biostatistics- B.K. Mahajan.
2. An introduction to Biostatistics and research Methodology-Sunder rao.P.S.S.
3. Biostatistics- A Manual of statistics Methods-Visweshwar Rao.

ENTREPRENEURSHIP IN PHYSIOTHERAPY

(Not for University Examination).

Teaching Hours: 40 hours.

1. Introduction:

- 1.1. Entrepreneurial physical therapist.
- 1.2. Motivations for private practice.
- 1.3 Essential entrepreneur characteristics and knowing the entrepreneur talents.
- 1.4. Opportunities and threats associated with private practice.

2. Guiding Behaviour

- 2.1. Values and ethical principles: personal values, philosophical statement, mission statement, vision statement, professional ethics, selected behaviour related documents of the Indian physiotherapy association (IAP).
- 2.2 Clinical establishment act standard for physiotherapy centre in India.
- 2.3 Legal framework in India in business environment
- 2.4 Health care system and regulatory rules and reforms in India.
- 2.5. Role of documentation
- 2.6. Liability with various practice settings
- 2.7. Legal issues, private malpractice insurance

3. Business Acumen

- 3.1. Leading, managing and supervising
- 3.2. Communicating with skill
- 3.3. Strategic planning, structural framework, importance of networking
- 3.4. Organizing for business success
- 3.5 Management and decision making
- 3.6 Marketing basics
- 3.7. Employment and labor law in India.

4. Financial Awareness

4.1. Economic principles

4.2 Accounting and financing

4.3 Making structured personal financial decision

RECOMMENDED STUDY MATERIAL:

TEXTBOOKS:

1. Managerial and supervisory principles for physical therapists. 3rd edition. Larry J nosse.
2. The physical therapist's business practice and legal guide. Sheila k. Nicholson.

REFERENCE BOOKS:

1. Starting and Managing Your Own Physical Therapy Practice. 1st Edition. Sameul H esterson.
2. The Financial Success Guide for Private Practice Physical Therapists. P Christopher Music
3. <http://clinicaestablishments.gov.in/WriteReadData/597.pdf>