SYLLABUS

BACHELOR OF PHYSIOTHERAPY
(B.P.T.) DEGREE COURSE

Academic year 2013-14 and Progressively
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2013-14 AND PROGRESSIVELY
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Vision, Mission & Goals of the University

Vision

To provide quality in all spheres of higher learning in general and Health Services in particular to all including those in the rural and urban areas of the nation, keeping in view the societal needs in the global context.

Mission

To impart and disseminate knowledge, develop competencies and also to provide for Research and Development in the emerging areas of Health Sciences, Science and Technology, Business Management, Hospitality Management, Law, Liberal Education, Teacher’s Education, Sports etc.

Goals

To be recognized as one of the leading institutes of higher learning in India and gain recognition in the global arena.
INTRODUCTION

a) PADMASHREE DR. D.Y. PATIL UNIVERSITY:

Visualizing the power of quality as early in the 1980, Padmashree Dr. D.Y. Patil started providing facilities for higher education for the young talented students over the years. The D.Y. Patil Group with its commitment and dedication has earned a reputation of being a provider of quality education in particular in areas of professional significance. It has 150 educational institutions from the Pre-primary stage to Post Graduate stage located in Mumbai, Navi Mumbai, Pune and Kolhapur catering to the educational needs of aspiring boys and girls.

In the Medical and Dental education, Dr. D.Y.Patil Medical College and Dr. D.Y.Patil Dental College & Hospital, Navi Mumbai, have been providing quality education since 1990. Recognizing this, on the recommendations of the University Grants Commission the Government of India has declared these two colleges of Padmashree Dr. D.Y.Patil as a Deemed to be University. This has provided a boost to these two colleges in general and the teachers and students in particular to make the University a world-class university in medical and dental education.

In 2009 following Departments under the ambit of Dr. D. Y. Patil Vidyapeeth have been approved by University Grants Commission:

1. Dr. D. Y. Patil College of Ayurved & Research Institute
2. Department of Physiotherapy
3. Department of Biotechnology & Bioinformatics
4. Department of Business Management
5. Department of Education
6. Department of Hospitality & Tourism Studies

The Association of Indian Universities has also accepted this University as its member.

The students benefit from the experience of quality teachers and the excellent infrastructure that they are provided with to help them realize their dreams of becoming competent professionals who can contribute to cause of national development.

The degrees and diplomas awarded by this University have the same status and recognition as those awarded by any Indian University recognized by the University Grants Commission, New Delhi. This University operates its educational programmes in accordance with the norms, regulations and guidelines laid down by the various statutory Central Government Bodies - Medical Council of India, Dental Council of India, Central Council of Indian Medicines and All India Council of Technical Education, New Delhi etc.

b) DEPARTMENT OF PHYSIOTHERAPY, PADMASHREE.DR.D.Y.PATIL UNIVERSITY.

Physiotherapy plays an important role in rehabilitating patient to his or her predisease status. It is said that a physician adds years to life while a Physiotherapists adds life to years.

During the course of four years, the programme provides an educational experience of the essentials required for the health care in the country. The educational process involves problems based learning, which enables the students to identify, discuss and analyze various dysfunctions incorporating institutional management as well as community based rehabilitation. The learning process is further strengthened during 6 months of mandatory, rotatory internship programme
where students learn to treat the patients under the guidance and supervision of competent teachers.

The college and physiotherapy O.P.D. are very well equipped with modern and advanced Electrotherapeutic and Exercise therapeutic equipments. There is also an advanced Electrophysiology and Exercise physiology laboratory for Electro Diagnosis and Fitness programme respectively. Department boasts of State of the Art Electrotherapeutic & Electrodiagnostic Unit, Kinesiotherapy & Physical Diagnosis Unit, Musculoskeletal Physiotherapy Unit, Neuro Physiotherapy Unit, Cardiovascular & Respiratory Physiotherapy Unit, Sports Physiotherapy Unit & Unit of Physiotherapy in Community Health. The faculty comprises of well qualified, competent, enthusiastic teachers. Students learn basis sciences in first two years and implementation of the same on patients in third and final year. Faculty helps the students to understand functional diagnosis and management of the patient, aimed at learning structural and functional impairments, activity limitation and participation restriction with particular emphasis given on clinical reasoning. There is good intra and inter faculty interaction and various integrated programmes are held to bring about a good learning experience.

The syllabus of B.P.T. has been developed under the supervision of Prof. Mrs. Sujata Yardi, Dean & Chairperson of the Physiotherapy Pre & Para Clinical Board of Studies & Clinical Boards of Studies, in consultation with the faculty and concerned Heads of the Departments and further scrutinized by the academic section.

2. AIMS AND OBJECTIVES OF B.P.T DEGREE COURSE

2.1 On completion of the course of study having successfully passed the examination, the candidate would be able to achieve a satisfactory level of efficiency:

i. To Detect and evaluate the anatomical, patho-physiological impairments, resulting in dysfunction of various age groups & occupation; as well as epidemiological sectors in the population & arrive at appropriate diagnosis.

ii. To understand the rationale & basic investigative approach to the medical system and surgical intervention regimens & accordingly plan & implement specific Physio-Therapy measures effectively.

iii. To be able to select strategies for cure and care; adopt restorative & rehabilitative measures for maximum possible independence of a client at home, work place & in the community.

iv. To maintain healthy relationship & Co-partnership with various professionals in the health delivery system in the primary interest of a client.

v. To ensure quality assurance & motivate the client & her/his family for a desirable client compliance.
vi. To develop communication skills for the purpose of transfer of suitable technique to be used creatively at various stages of treatment, compatible with psychological status of the beneficiary.

vii. To promote health in general in Geriatrics, Women’s health, Industrial medicine as well as at competitive level, such as sports, keeping in mind National Health Policies.

viii. To practice professional autonomy & ethical principles with referral as well as first contact clients in conformity with ethical code for physiotherapists.

3. REGULATIONS RELATING TO BACHELOR OF PHYSIOTHERAPY (B.P.T) DEGREE COURSE

3.1 PREAMBLE:

3.1.1 This syllabus is framed under the provision of Rule 26 (C) of the MOA 2003 of the University.

3.1.2 The Bachelor of Physiotherapy programme shall be under the Faculty of Physiotherapy.

3.1.3 The name of the Degree programme shall be Bachelor of Physiotherapy (B.P.T)

3.2 ELIGIBILITY:

3.2.1 The candidate must be either of 17 years of age or attain this age at the time of admission. Candidate should have passed H.S.C. (10+2) or equivalent examination from a recognized Board with Physics, Chemistry and Biology as mandatory subjects, preferably with minimum 50% marks in PCB. Candidate should have secured minimum of 50% marks in Physics, Chemistry and Biology taken together at the competitive entrance examination of this university.

3.2.2 All the backward class (Scheduled caste and Scheduled tribe) students shall have relaxation of 10% in the aggregate marks required for eligibility.

3.3 MIGRATION/TRANSFER OF CANDIDATES:

Students studying in the Physiotherapy College of this University may be allow to migrate or transfer to a Dental College of another University provided a similar curriculum is followed by the two Universities. The migration/transfer will not be entertained in the middle of academic year.

3.4 DURATION OF THE COURSE:

3.4.1 Duration of the BPT course will be four calendar years followed by compulsory six months Rotatory Internship.

3.5 PROCEDURE OF SELECTION:

3.5.1 Candidates who secure the minimum 50% marks at AIET i.e. All India Entrance Test conducted by the University shall be eligible for admission to BPT course.
3.6. **PHYSIOTHERAPY CURRICULUM:**

3.6.1 The aim and objectives of the B.P.T curriculum is to educate and train a student as a qualified Physiotherapist who will be able to impart health services safely and effectively to community in terms of health promotion, functional diagnosis, prevention and treatment of dysfunction in different fields of medical science.

3.6.2 The teaching and training programme shall be evolving one and there shall be more emphasis on demonstration, clinical work, seminars and group discussion than on classroom teaching. The student shall have clinical experience in different fields like Orthopedics, Neurology, Chest and Cardiac conditions, Paediatrics, Surgery etc. Students shall visit and work at community centers like primary health centers, geriatric homes, paraplegic homes, orphanages, NASEOH etc. as a part of training for community rehabilitation.

3.6.3 The progress of the student shall be monitored through the seasonal examinations. A record of student’s work shall be maintained which would form the base for internal assessment. The students shall be encouraged to do clinical presentations, to participate in group discussions and seminars, to prepare community related projects to enable them to develop personality, expression and acquire depth of knowledge.

3.7. **REGULATIONS AND SCHEME OF EXAMINATION (BPT COURSE):**

3.7.1 The scheme of examination for the B.P.T. course shall be divided into 4 professional examinations, namely, I\textsuperscript{st} B.P.T. examination at the end of 1\textsuperscript{st} academic year, II\textsuperscript{nd} at the end of 2\textsuperscript{nd} academic year, III\textsuperscript{rd} at the end of 3\textsuperscript{rd} academic year and IV\textsuperscript{th} and final B.P.T examination at the end of 4\textsuperscript{th} academic year.

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

3.7.3 Certificate to the above effect be procured from the Head of the Department by the candidate along with the application for examination and the prescribed fee. Examination shall be held twice in a year. There will be 2 tests in each year (class and 20% of the total marks in each subject’s theory and practical / clinical individually will be assigned to these tests.)

3.8. **RULES FOR A.T.K.T (ALLOW TO KEEP TERMS) SHOULD READ AS:**

3.8.1 A candidate who has passed in all the subjects but two (maximum) at the I\textsuperscript{st} B.P.T. examination shall be allowed to keep terms for II\textsuperscript{nd} B.P.T. first term only, but the candidate shall not be permitted to keep II\textsuperscript{nd} B.P.T. 2\textsuperscript{nd} term and to appear at II\textsuperscript{nd} B.P.T. examination unless such candidate passes I\textsuperscript{st} B.P.T. examination completely, one clear academic term prior to appearing for the II\textsuperscript{nd} B.P.T. examination and only after keeping required terms of II\textsuperscript{nd} B.P.T.

3.8.2 A candidate who has passed in all the subjects but two (maximum) at the II\textsuperscript{nd} B.P.T. examination shall be allowed to keep terms for III\textsuperscript{rd} B.P.T. first term only, but the candidate shall not be permitted to keep III\textsuperscript{rd} B.P.T. 2\textsuperscript{nd} term and to appear at III\textsuperscript{rd} B.P.T. examination unless such candidate passes II\textsuperscript{nd} B.P.T. examination completely, one clear academic term prior to appearing for the III\textsuperscript{rd} B.P.T. examination and only after keeping required terms of III\textsuperscript{rd} B.P.T.

3.8.3 A candidate who has passed in all the subjects but two (maximum) at the III\textsuperscript{rd} B.P.T. examination shall be allowed to keep terms for IV\textsuperscript{th} B.P.T. first term only, but the candidate shall not be permitted to keep IV\textsuperscript{th} B.P.T. 2\textsuperscript{nd} term and to appear at IV\textsuperscript{th} B.P.T. examination unless such candidate passes III\textsuperscript{rd} B.P.T. examination
completely, one clear academic term prior to appearing for the IVth B.P.T. examination and only after keeping required terms of IVth B.P.T.

3.9. **MAXIMUM MARKS IN EXAMINATION:**

3.9.1 Subject-wise marks are mentioned in the syllabus.

   For passing the examination, the candidate must secure a minimum of 50% marks of total marks each in theory and practical, i.e. 50% marks in the aggregate of University examination and internal assessment of theory and practical/ Clinical separately.

3.10. **DURATION OF EXAMINATION:**

3.10.1 Each written paper of 80 marks shall be of 3 hours duration and of 40 marks shall be of 2 hours duration.

3.11. **ATTENDANCE:**

3.11.1 75% in theory and 75% in practical/clinical in each subject in each year.

3.12. **FIELD PROGRAMME IN COMMUNITY PHYSIOTHERAPY:**

   There shall be participation of students in health camps and projects in final year and during internship with a view to expose the students to problems of rural and semi urban areas.

**SYLLABUS**

4. **TITLES OF SUBJECTS OF STUDY**

   **First Year**
   
i) Introduction to Physiotherapy
   
ii) Anatomy
   
ii) Physiology
   
iii) Biochemistry
   
iv) Fundamentals Exercise Therapy
   
v) Fundamentals of Electro Therapy
   
vi) Supervised clinical practice

   **Second Year**
i) Pathology

ii) Microbiology

iii) Pharmacology

iv) Kinesio-Therapeutics

v) Electro - Physical Agents

vi) Psychology

vii) Supervised Clinical practice

**Third Year**

i) Surgery

   General Surgery

   Orthopedics

ii) Medicine

   Cardio-vascular & pulmonary Medicine

   Neurology

   General Medicine, Rheumatology & Gerontology

iii) Pediatrics

iv) Dermatology

v) Physical Diagnosis & Therapeutic skills

vi) Psychiatry

vii) Obstetrics and Gynaecology

viii) Community Health/Sociology & Biostatistics

    Section-I-Community health

    Section-II-Biostatistics

    Section-III- Sociology

ix) Supervised Clinical practice
Fourth Year

i) Musculoskeletal Physiotherapy
ii) Neuro- Physiotherapy Sciences
iii) Cardiopulmonary & Integumentry Physiotherapy
iv) P.T. in Community Health
v) Principles of Bio-engineering
vi) Professional issues / Administration/Management-/Marketing
vii) Research Methodology & Biostatistics
viii) Supervised clinical practice + Project

The syllabus is classified in to three different levels as –

Level 1 – Must know
Level 2 – Desirable to know
Level 3 – May know
INTRODUCTION TO PHYSIO THERAPY ------------------ [10 hrs]
Objective—By the end of the 10 hours of introduction, the candidate will—

1] Acquire the geographical orientation of the various concerned sections of the college & the clinical training areas

2] Get the overall idea about the graduate program & its scope in the professional practice

3] Learn the Bed-side manners, General Ethical code & discipline of the Department

4] Acquire the skill of History taking in general

Human Anatomy

Didactic- 100 hrs
Practical’s – 150 hrs
Total – 250 hrs

GOAL

The broad goal of the teaching of undergraduate students in Anatomy aims at providing comprehensive knowledge of the gross anatomy, microscopic structures, development of human body and principles of genetics to provide a basis for understanding the clinical correlation of organs or structure involved and the skills to practice as a qualified Physiotherapist.

OBJECTIVES:

A – Knowledge:

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

• Comprehend the normal disposition, inter-relationships, gross, functional and applied anatomy of the musculoskeletal system, locomotion, posture, gait and various organs in the body.

• Comprehend the basic structure and connections between the various parts of the central nervous system so as to analyze the integrative and regulative functions of the organs and systems. He/she should be able to locate the site of gross lesions according to the deficits encountered.

• Identify the microscopic structures of various tissues and organs in the human body and correlate the structure with the functions
• To understand the basic principles of embryology including genetic inheritance and stages involved in development of the organs and systems from the time of conceptions till birth.

• To study the basic principles of radiology and for comprehending deeper structures in the human body.

B. Skills

At the end of the course the students shall be able to:

a) Identify and locate all the structures of the body and mark the topography of the living anatomy.

b) Identify the organs and tissues under the microscope.

c) Understand principles of karyotyping and identify the gross congenital anomalies.

d) Understand the principles of imaging techniques and interpretation of anatomical structures on plane radiographs of the body.

C. Integration

From the integrated teaching of other basic sciences, students shall be able to comprehend the functions of the organs and systems in the body and thus interpret the anatomical basis of disease processes.

Syllabus

I. GENERAL ANATOMY:

• **Introduction** to the subject, Subdivisions of anatomy, Anatomical positions, Descriptive terms.

• **Bones**: Definition of bone, Classification – Morphological, structural- Macroscopic & Microscopic, Developmental, Regional, Structure of long Bone, Parts of long bone- epiphysis, diaphysis, metaphysis. Types of epiphysis, Ossification- Primary and secondary centers, Law of ossifications, Blood supply, Functions,

  – **Level 2**: Medico-legal importance & applied anatomy.

• **Cartilage**: Definition, classification, structure distribution, Applied Anatomy

• **Joints**: Definition, classification, fibrous, cartilaginous & synovial Nerve supply, blood supply of joints
- **Level 2**: Factors limiting, range of movement, Joint Position- Loose packed, close packed
- **Level 3**: Osteoarthritis, dislocation.

- **Muscles**: Definition, Types- skeletal, cardiac, visceral.
  Skeletal muscle – Origin, insertion, Morphological Classification,

- **Level 2**: Power of muscle, range of contraction, active Insufficiency, passive insufficiency, structural and functional correlation, hypertrophy, hyperplasia, Shunt, swing and spin components of muscle.
  Distribution, structure, blood supply, nerve supply, Neuromuscular junctions, Body lever system.
- **Level 3**: Paralysis, atrophy, myasthenia gravis

- **Skin** – Thin & thick, appendages, dermatomes
  - **Level 2**: Tension lines, flexure lines Langer’s lines
  - **Level 3**: Skin grafts

- **Superficial fascia, Deep fascia** – modifications, Retinacula, Aponeuroses,

- **Bursa** – Types-communicating, non-comunicating, subcutaneous, subfascial, subtendinous, interligamentous
  - **Level 2**: Adventitous bursae- housemaid’s knee clergyman’s knee, student’s elbow, weaver’s bottom, porter’s shoulder, bunion
  - **Level 3**: Bursitis

- **Ligaments**: Definition, types –
  
  **A.** According to structure: collagen fibres, elastic fibres.

  **B.** According to relation to joints- intrinsic, extrinsic

  - **Level 2**: sprains

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### II. REGIONAL ANATOMY:

#### UPPER LIMB:
• **Regions** - Breast, Shoulder region, Axilla, Arm, Cubital fossa, Forearm, Hand.
  - **Level 2**: Grips of hand, forearm spaces, radial bursa, ulnar bursa, palmar spaces, Dupuytren’s contracture, carpal tunnel syndrome, breast cancer
  - **Level 3**: Axilla- abscess drainage. Fascial spaces- Surgical significance

• **Bones**: Scapula, Clavicle, Humerus, Radius, Ulna, Articulated hand
  - **Level 3**: Fractures of clavicle, humerus, scaphoid Colles fracture, mallet finger, trigger finger

• **Joints** - shoulder girdle, shoulder joint, Elbow, radioulnar joints, Wrist, first carpo-metacarpal joint
  - **Level 2**: Dislocation of shoulder, carrying angle
  - **Level 3**: Subluxation of head of radius, tennis elbow, golfer’s elbow; cubitus valgus, subacromial bursitis, frozen shoulder.

• **Muscles** - Trapezius, Serratus anterior, Latissimus dorsi, Pectoralis major, Deltoid, Biceps brachii, Triceps brachii, rotater cuff muscles
  Brachioradialis, Brachialis, Choracobrachialis, Pronator teres, Pronator quadratus, Supinators, Flexor digitorum profundus, Flexor digitorum, superficialis, Flexor pollicis longus, Palmaris longus, flexor carpi radialis flexor carpi ulnaris, extensor digitorum, extensor indicis, abductor pollicis longus and brevis, extensor carpi radialis, extensor carpi ulnaris, intrinsic muscles of the hand.
  - **Level 3**:Triangle of auscultation, intramuscular injections

• **Blood vessels-Arteries** Axillary, brachial, radial, ulnar
• **Veins** – cephalic, basilic, median cubital
• **Lymphatics** – Axillary lymph nodes
  - **Level 3**: Veins- thrombosis; intravenous injection, Lymphangitis, lymphadenitis

• **Nerves**- Brachial plexus, axillary, median, ulnar, musculocutaneous, Radial nerves, Dermatomes.
  - **Level 2**: Ape hand, claw hand, wrist drop
  - **Level 3**: Winging of scapula, Erb’s palsy, Klumpke’s palsy, crutch palsy

**LOWER LIMB:**
• **Regions**: Compartments of thigh, femoral triangle, adductor canal, Gluteal region, Popliteal fossa, Leg, arches of foot, sole.
  - **Level 2**: Pes cavus, pes planus, club foot. Walking cycle.
• **Bones** – Hip, Femur, Tibia, Fibula, Patella, Articulated foot,
  - **Level 2**: Blood supply to head of femur, fracture neck of femur.
• **Joints** - Hip, knee, tibio fibular, ankle, subtalar, talocalcaneonavicicular.
  - **Level 2**: Hip dislocation, injury to menisci and cruciate ligaments, Ankle sprains
  - **Level 3**: Pott’s fracture, hip and knee replacements
• **Muscles**: Quadriceps femoris, sartorius, Psoas major,
  Iliacus, Gluteus maximus: medius and minimus, quadratus femoris,
  Biceps femoris, Semitendinosus, Semimembranosus, Popliteus, Adductor longus brevis and magnus, Soleus, Gastrocnemius, Tibialis anterior,
  Tibialis posterior, Peroneus longus, brevis and tertius, Flexor digitorum longus, flexor hallucis longus, extensor hallucis longus, extensor digitorum longus, extensor digitorum brevis, intrinsic muscles of the foot.
  - **Level 2**: Calf pump, intramuscular injection in gluteus maximus
  - **Level 3**: Antigravity muscles, tendon rupture, tendon transplant
• **Blood vessels** - Arteries femoral, popliteal, dorsalis pedis.
• **Veins** - venous drainage of lower limb, great and small saphenous veins
  Communications and valves.
• **Lymphatics**: Inguinal group of lymph nodes
  - **Level 2**: Varicose veins.
• **Nerves**: Sciatic, femoral, obturator, tibial, common peroneal, superficial peroneal, deep peroneal, sural, Lumbar and sacral Plexus.
  - **Level 2**: Sciatica, foot drop.

**VERTEBRAL COLUMN**:
Normal curvatures, abnormal curvatures, intervertebral disc, Posture and Gait, line of gravity, centre of gravity,

Weight, transmission, postural muscles.

- **Level 2**: Prolapsed intervertebral disc.
- **Level 3**: Spondylosis, spondylitis

**THORAX:**

**Regions and organs:**

- **Thoracic Wall** - Intercostal spaces, boundaries and contents of typical intercostal spaces, Thoracic inlet, Thoracic outlet - Thoracoabdominal diaphragm - major openings, Movements of respiration
  - **Level 2**: Pleural tapping
- **Media stinum** - Boundaries, divisions and major contents
  - **Level 2**: Mediastinal syndrome
  - **Level 3**: Mediastinitis, Mediastinoscopy
- **Pleura** : Reflections, recesses, innervation
  - **Level 2**: Pleural effusion, pleuritis, pneumothorax
- **Lungs**: Lobes, bronchopulmonary segments
  - **Level 2**: Surgical importance of bronchopulmonary segment
  - **Level 3**: Lung abscess, postural drainage, foreign body inhalation, Bronchoscopy
- **Pericardium** – Pericardium and sinuses,
  - **Level 3**: Pericardial effusion, pericardial tapping
- **Heart** – Morphology, Blood supply
  - **Level 2**: Nerve supply, angina pectoris, myocardial infarction, functional end arteries, coronaries.
  - **Level 3**: Cardiac catheterization, Angioplasty, coronary bypass, heart transplants
- **Blood vessels**: Aorta, Azygous vein, Superior vena cava, Thoracic duct.
- **Bones**: Thoracic vertebrae, sternum, ribs, movements of ribs
  - **Level 2**: Barrel chest, Pectus cavus
  - **Level 3**: Fracture of ribs, Flail chest, Sternal puncture
• **Joints**: Manubriosternal, Costovertebral, sternocostal, costochondral

**ABDOMEN:**

• **Regions and Organs:**

  1. **Anterior abdominal wall** rectus sheath, quadrants

  2. **Inguinal canal** – Location, extent, boundaries and contents
    - **Level 2**: Inguinal herniae

• **Organs**: Morphology, Relations, Blood supply, lymphatic drainage, Nerve supply of - Stomach, Spleen, Liver, Pancreas, Small Intestine, Large Intestine, Vermiform Appendix, Kidneys, Supra Renal, Ureters, Urinary Bladder, Uterus, Uterine Tubes, Ovaries, Testis, Prostate, Male Urethra, Rectum and Anal Canal.
    - **Level 2**: Splenomegaly, hepatomegaly, gastric ulcers, cancer of head of pancreas, Appendicitis, McBurney’s point, renal colic, prolapse of uterus, caesarean section, IUCD, hydrocele, Vasectomy, per rectal examination, external and internal piles, metastasis of prostatic cancer, per vaginal examination. Tubectomy.

• **Bones**: Lumbar vertebrae, sacrum, differences between male and female pelvis
    - **Level 2**: Types of pelvis - android, gynaecoid, anthropoid, platypoid.
    - **Level 3**: Sacralization, lumbarization, pelvimetry

**MUSCLES**: Psoas major, quadratus lumborum

    - **Level 3**: Psoas abscess

**Nerves**: Lumbar plexus and sacral plexus

**Blood vessels**: Abdominal aorta, inferior vena cava

**HEAD, FACE AND NECK**

**I. Regions and Organs:**

    - **Level 2**: Axillary sheath

• **Glands**: Thyroid, Parathyroid, Parotid, Submandibular, Sublingual, Pituitary
- **Level 2:** Goitre, Pressure symptoms due to enlarged thyroid, parotid abscess, mumps.
- **Level 3:** Thyroidectomy, parotidectomy

- **Face:** Muscles, Nerve supply, Blood supply, lymphatic drainage
  - **Level 2:** Facial palsy, dangerous area of face

- **Scalp:** Layers, Muscles, Nerve supply, Blood supply, lymphatic drainage
  - **Level 2:** Black eye, dangerous layer of scalp
  - **Level 3:** Gaping of wounds, sebaceous cysts

- **Palate:** Muscles, Nerve supply, Blood supply
- **Tongue:** Muscles, Nerve supply, Blood supply, Lymphatic drainage
- **Larynx:** Cartilages, Interior, Muscles, movements of vocal cords, Nerve supply, Blood supply,
  - **Level 2:** Singer’s nodule
  - **Level 3:** Direct and indirect laryngoscopy, Tracheostomy

- **Pharynx:** Muscles, Nerve supply, Blood supply, Pharyngotympanic tube, Palatine tonsils.
  - **Level 2:** Tonsillitis, Tonsillectomy, Quinsy

- **Orbit:** Bony orbit, contents- Eyeball, Extraocular muscles, Lacrimal apparatus
  - **Level 2:** Squint

- **Styloid apparatus:** Components,

- **Nasal Cavity:** Nasal septum, lateral nasal wall, Paranasal sinuses maxillary air sinus
  - **Level 2:** Epistaxis, Sinusitis, Deviated nasal septum.
  - **Level 3:** Drainage of maxillary sinus, Cancer of Maxillary sinus, C.S.F. Rhinorrhoea

- **Ear:** External Ear, Middle Ear – boundaries, contents, Nerve supply, Blood supply, Internal Ear
  - **Level 2:** Otitis media, Myringotomy
  - **Level 3:** C.S.F. otorrhoea, otosclerosis

- **Meninges:** Blood supply, nerve supply, folds- falx cerebi, tentorium cerebelli,
  - **Level 2:** Meningitis, extradural, subdural, subarachnoid haemorrhage
  - **Level 3:** Cisternal puncture

- **Vertebral canal:** Contents, epidural, subdural; subarachnoid spaces.
  Contents of intervertebral foramen, vertebral venous plexus,
– **Level 2**: Lumbar puncture
– **Level 3**: Spread of infections or tumours, secondaries in vertebrae.

**II. Bones** – Skull- anatomical position, Normae, interior of cranial cavity, Foramina in the skull, cervical vertebrae, Mandible- age changes, Foetal skull, Differences between Adult and Foetal skull, cervical rib

– **Level 2**: Fontanelles, functions and applied aspects,
– **Level 3**: Fractures of the skull, age of dentition, disc herniation

**III. Joints** - Temporomandibular joint , Atlantoaxial & atlanto-occipital joints

– **Level 3**: Locked jaw, fracture of dens during hanging

**IV. Muscles** - Sternocleidomastoid, digastric, mylohyoid, lateral pterygoid, Buccinator, Masseter, scalenus anterior medius and posterior, Orbicularis oris, Orbicularis oculi, Hyoglossus, muscles of -face, mastication, larynx, pharynx, tongue, palate, extra-ocular

– **Level 2**: Torticolis

**V. Blood vessels** - **A. Arteries** - Subclavian, internal carotid, external carotid, vertebral, facial, maxillary

– **Level 3**: subclavian steal syndrome,

B. **Veins** - external and internal jugular, Emissary veins

C. **Venous sinuses** – paired, unpaired, Cavernous sinus

– **Level 3**: Applied anatomy, cavernous sinus thrombosis

**VI. Lymphatic Drainage** – Cervical lymph nodes.

**VII. Nerves** - Oculomotor, Trigeminal, Facial Glossopharyngeal, Vagus Hypoglossal, Cervical plexus, Parasympathetic ganglia – Ciliary, Pterygopalatine, Submandibular, Otic Cervical sympathetic chain

– **Level 2**: Third nerve paralysis, Trigeminal neuralgia, Bell’s palsy.

**NEUROANATOMY**
• **SPINAL CORD** - Gross features: Extent (child/adult), enlargements, conus medullaris, filum terminale, spinal meninges
  - **Level 2:** Lumbar puncture

• **MEDULLA OBLONGATA** - Gross features: pyramid, olive, cranial nerves, inferior cerebellar peduncle,
  - **Level 3:** Medullary syndromes- medial and lateral, Bulbar palsy

• **PONS** : Gross features – Ventral - Cranial nerves V, VI, VII, VIII middle cerebellar Peduncle, Dorsal - Floor of the fourth ventricle, Facial colliculus

• **CEREBELLUM** - Gross features, Lobes, Peduncles - important tracts in Peduncles
  - **Level 2 :** Embryological divisions, cerebellar Nuclei, details of dysfunction - disequilibrium, ataxia, hypotonia

• **MIDBRAIN** - Gross features, Ventral, Interpeduncular fossa and cistern, III and IV nerve, Dorsal - colliculi, superior cerebellar peduncle,

• **CRANIAL NERVE NUCLEI** Names of 12 Pairs of nerves, nuclei with their functional components, locations.

• **CEREBRUM** - Hemispheres- white matter, basal nuclei, limbic lobe, Surfaces, borders, major sulci, gyri, poles, lobes, major functional areas, cerebral dominance, speech, handedness.

• **VENTRICULAR SYSTEM** – Lateral, third & fourth ventricles, Boundaries, foramina, choroid plexuses
  - **Level 3:** Hydrocephalus

• **BLOOD SUPPLY** - Circle of Willi’s, arteries, veins
  - **Level 2:** Blood brain barrier, hemiplegia

**III. MICROANATOMY**

• **Microscope** - Light Microscope – parts, magnification, resolution.

• **Cytology** - **Cell** - Cytoplasm and nucleus

  **Cytomembranes** unit membrane, fluid mosaic model, exocytosis, endocytosis


  Ribosomes
**Cytoplasmic Inclusions** – Fat, Glycogen, lipofuscin

**Cytoskeleton** - Microtubules, Microfilaments, Intermediate filaments. Cilia, Flagellum, Centrioles

**Nucleus** – Nuclear membrane, Chromatin, Nucleolus

**Intercellular Contacts**-

1. Without Cytological specialization

2. Specialized cell junctions - zonula occludens, zonula adherens, macula adherens Or Desmosome, Gap Junction

**Cell Motility**-

A. **Movement within the cell**- Transport of vesicles, exocytosis, role of microtubules

B. **Movement of the cell** - Mitotic spindles, cleavage, pseudopodia etc.

   – **Level 2**: Effects of colchicine and anticancer drugs on spindles

**GENERAL MICROANATOMY**

- **Epithelial tissue**- a) **Covering** – Classification – Simple- squamous, cuboidal, columnar, simple columnar ciliated, simple columnar brush bordered pseudostratified columnar ciliated, stratified squamous non- keratinised & keratinised stratified cuboidal, stratified columnar, urothelium (transitional) neuroepithelium, gustatory, olfactory, statoacoustic, myoepithelium

   – **Level 2**- Nutrition, renewal, innervation

   – **Level 3** -Metaplasia- cigarette smoking, chronic vitamin A deficiency.

**Basement membrane**

**Surface modifications** : cilia, microvilli, stereocilia

b) **Glandular**- Unicellular and muticellular, exocrine, endocrine – Simple, compound, branched, tubular, alveolar, tubuloalveolar, saccular, serous, mucous, mixed, Apocrine , merocrine, holocrine
- **Level 3** - Adenocarcinoma

- **Connective Tissue** - Definition, Classification - embryological / adult; cells, ground substance, Fibres – types collagen, Reticular, Elastic. Loose areolar, tendon, dense irregular, adipose tissue

- **Cartilage** – Hyaline - costal, articular, Fibrous, elastic,
  - **Level 2** – Growth-Interstitial, appositional
  - **Level 3**  Chondroma, chondrosarcoma

- **Bone** – compact, cancellous, developing bone
  - **Level 3**- Osteoporosis, osteopetrosis

- **Muscle tissue** –Skeletal muscle L.S. & T.S, sarcomere red fibres, white fibres visceral (smooth) muscle, Cardiac muscle – intercalated disc.
  - **Level 3** – Hypertrophy, hyperplasia, rigor mortis, myasthenia gravis

- **Nervous tissue** -Neurons types, neuroglia, myelinated nerve L.S., T.S.,
  Node of Ranvier

- **Blood Vessels**- Large sized artery, Medium sized artery, sinusoid, Capillaries, medium sized vein.

- **Lymphoid Tissue** – T and B lymphocytes, mucosa associated lymphoid tissue (MALT), Lymph node, Thymus, Spleen, Tonsil
  - **Level 2**: Blood thymus barrier, Humoral & cell mediated immunity.
  - **Level 3** : Organ transplantation, Graft rejection, autoimmune disease

**SYSTEMIC MICROANATOMY**

- **Integumentary System** - Skin- epidermis and dermis, Types- hairless skin, hairy skin, appendages.
  - **Level 2**- Renewal of epidermis
  - **Level 3** – Psoriasis, vitiligo, albinism, malignant melanoma, Acne.

- **Respiratory System** - epiglottis, trachea, lung.- bronchus, bronchioles, alveoli.
  - **Level 2** – Double spirally arranged bronchial smooth muscle.
- **Level 3**- Bronchial asthma, immotile cilia syndrome, hyaline membrane disease, heart failure cells.

- **Nervous System** - Cerebrum, cerebellum, spinal cord sections – cervical, thoracic, lumbar.

## IV. EMBRYOLOGY

### GENERAL EMBRYOLOGY

- **STAGES OF HUMAN LIFE**

  - **Prenatal** - Zygote, Pre-Embryonic, Embryonic, Fetal, Birth Events

- **GAMETOGENESIS**  -  Mitosis, Meiosis, Nondisjunction Apoptosis, Menstrual Cycle, Gametogenesis - Spermatogenesis, Oogenesis, Abnormal gametogenesis, Fertilization, Methods of Contraception.

- **FIRST WEEK**: Cleavage, Compaction, Morula, Blastocyst; Implantation – Normal and Abnormal Sites, Placenta Praevia.
  
  - **SECOND WEEK**: Cytotrophoblast, Syncytiotrophoblast

  - **Level 2**: Decidual reaction.

  - **Level 3**: Pregnancy tests.

- **FOLDING OF THE EMBRYO** : Derivatives of germ layers, Concept of critical Period,
  
  - **Level 3**: Thalidomide tragedy

- **FETAL MEMBRANES** : Chorion, Amnion, Yolk sac, Allantois, Decidua,
Umbilical cord, Placenta, Twinning – monozygotic, dizygotic, Multiple pregnancies.

- **Level 2**: Anomalies of placentas, Types of cord attachments.

**DEVELOPMENT OF NERVOUS SYSTEM**: Neural tube, Spinal cord; Brain-Forebrain, Midbrain and hindbrain

- **Level 2**: Spina bifida, Anencephaly, Hydrocephalus

**V. GENETICS:**

I. **Introduction to human genetics** – Mendel’s laws, mitosis, meiosis

II. **Cytogenetics** - Karyotype, Karyotyping: Details of X and Y chromosomes Barr body, Lyon’s hypothesis.

III. **Modes of Inheritance** – Autosomal dominant and recessive inheritance, Y-linked inheritance, x-linked dominant and recessive inheritance, Pedigree charting.

IV. **Medical Genetics**: Chromosomal aberrations - Structural : Deletion, Duplication, Translocation, Ring chromosome, Isochromosome etc. Numerical : Down, Turner, Klinefelter syndromes.

V. **Clinical Genetics**: Prenatal diagnosis, Genetic Counselling

**VI. RADIOLOGICAL ANATOMY:**

I) **Introduction**: Principles of radiography.

Identification of gross anatomical, features in plain radiographs.

II) **Radiographs of**:

a) **Upper limb**

Shoulder region  
Elbow region

b) **Lower limb**

Hip region  
Knee region
Wrist and hand, Ankle region, Foot

c) Abdomen
d) Thorax

Plain Radiograph-AP, Lat.  
Plain Radiograph : Male/Female

e) Head, Face & Neck

Plain Radiograph Skull, AP, Lat.

Plain Radiograph Neck, AP, Lat.

VIII. LIVING ANATOMY:

A) Upper Limb:

BONY LANDMARKS (PALPATION OF )

Clavicle, Spine of scapula, Inferior angle & Coracoid process of Scapula,

Epicondyles of Humerus, Olecranon process of ulna; Head and styloid

processes of radius and ulna, Heads of metacarpals (knuckles), Pisiform,

Hook of Hammate, Lister’s Tubercle.

JOINTS (DEMONSTRATION OF MOVEMENTS)

Shoulder girdle, shoulder joint, Elbow joint, Radio-ulnar joints, Wrist joint, 1st
carpo-metacarpal joint, MP and IP joints.

MUSCLES (DEMONSTRATION OF ACTION)

Principle of testing : Trapezius, Serratus anterior, Latissimus dorsi Pectoralis
major, Deltoid, Biceps Brachii, Brachioradialis, Brachialis, Supinator, Small

Muscles of the hand, Lumbricals, Interossei.

NERVES: DERMATOMES OF UPPER LIMB

Ulnar nerve thickening in Leprosy

VESSELS (PALPATION OF): Axillary artery, Brachial artery, Redial artery
OTHER: Axillary groups of lymph nodes; Anatomical snuff-box (boundaries)

**B) Lower Limb:**

**BONY LANDMARKS** (PALPATION OF): Anterior superior iliac spine, Iliac crest, Tubercle of the iliac crest, Ischial tuberosity, Greater torchanter, Adductor tubercle, Head and neck of fibula, Lateral and medial malleoli, Tibial tubersity, Subcutaneous surface of tibia, Patella

**JOINTS** (DEMONSTRATION OF MOVEMENTS): Hip, Knee, Ankle, Subtalar Joints.


**Nerves:** Dermatomes of lower limb:

Thickening of common peroneal nerve in Leprosy.

**Vessels:** (palpation of): Femoral, Popliteal, Dorsalis pedis, Posterior tibial.

**Others:** Inguinal lymph nodes, tendons- semitendinosus, Semimembranosus, Biceps femoris, Illiotibial tract Ligamentum patellae

**C) Abdomen:**


**Joints** (Demonstration of movements): Intervertebral

**Nerves:** Dermatomes of Anterior Abdominal wall

**D) Thorax:**


**Joints** (demonstration of movements): Intervertebral

**Others:** Apex beat, Apices of the lungs, Triangle of auscultation
E) Head face & Neck:


**Joints** - Demonstration of movements:

**Muscles** (Demonstration of Action): Muscles of Mastication, Muscles of face, Neck flexors and extensors –Sternocleidomastoid.

Cranial nerves Testing of cranial nerves oculomotor, troclear, trigeminal abducent, facial, glossopharyngeal, accessory: hypoglossal.

**Others:** Thyroid gland, Midline structures in the neck.

**RECOMMENDED BOOKS**

**Text Books**

**GROSS ANATOMY**

2. Anatomy by Vishram Singh
3. Clinical Anatomy for students by Neeta Kulkarni

4 Gray’s Anatomy by Susan Standring, 39th ed Elseiver, 2005 (reference book)
6 Human Anatomy vol. I, II, III. by Inderbir Singh

**GENERAL ANATOMY**

1. General Anatomy by Vishram Singh
3 Essentials of General Anatomy by Sushil Kumar

**NEUROANATOMY**

2 Clinical Neuroanatomy for Medical Students by Vishram Singh
3 Clinical Neuroanatomy of Medical Students by Richard Snell 6th ed. LWW 2003
4 Text Book of Neuroanatomy by G.P.Pal

**MICROANATOMY**

2. Text Book of Histology by Gunasegaran.
5. Histology Text and Atlas by Brijesh Kumar
6. Histology by Krishna Garg
7. Histology by Veena Bharihoke.

**EMBRYOLOGY**

1 Human Embryology by Arooshi, Indu Khurana
3 Developing Human by Keith Moore 8th ed.
5 Embryology by Sudhir Sant.

**GENETICS**

**GROSS ANATOMY ATLAS**

1. F. Netter Atlas
2. F. Netter Companion work book (pocket ed)
5. McMinns Atlas
6. Grant`s Atlas

**SAQs**

1. SAQs in Anatomy - V.G.Sawant. 3rd ed.

**MCQs.**


**MEDICAL DICTIONARY**

2. Understanding Anatomical Terms by Mehta, Natrajan, Kothari.
3. Stedman`s Pocket – Medical Dictionary.

**SCHEME OF UNIVERSITY EXAMINATION**
Student should get minimum 50% marks for passing the examination

**Scheme of Marking**

**Theory**: 80 Marks Theory paper + 20 Marks Internal assessment

Total - 100 Marks

**Practical**: Practical examination 80 marks + 20 Marks Internal Assessment

Total - 100 Marks

**Theory Paper : - 3 Hours**

**Section A** - MCQS – 20

Upper limb - 5
Lower limb - 5
Brain - 4
General anatomy - 1
Histology - 1
Embryology 1
Genetics 1
Organs - 2

20 Marks

**Section B** –

**Question 1** Write Short answers to **any seven** of the following questions

(7 x 2) = 14

a) Upper limb
b) Lower limb
c) Brain
d) General anatomy
e) Histology
f) Embryology
g) Genetics  
h) Locomotion  
i) Organs  

**Question 2** Write notes on **any four** of the following  

a) Upper limb  
b) Lower limb  
c) General anatomy  
d) Histology  
e) Organs  

**Section C**  

Attempt **any three** long answer questions out of the following. (10 x 3) = 30  

**Question 3** Upper limb  

**Question 4** Lower limb  

**Question 5** Brain  

**Question 6** Upper limb / Lower limb / Brain - Any one of these topics  

**Practical Examination 80 Marks**  

1) **Spots**–10 Spots - **four** marks each (10x4)  

Spots based on -  

   a) Bones - 3  
   b) Organs - 2  
   c) Head face neck - 1  
   d) Upper limb - 1  
   e) Lower limb - 1  
   f) Brain - 1  
   g) Histology - 2 Slides - two marks each
2) **Viva** - 30 Marks
   a) Bones and radiology – 15 Marks
   b) Soft parts - 15 Marks

3) **Journal** - 10 Marks

**INTERNAL ASSESSMENT EXAMINATIONS**

a) Two Internal assessment examinations shall be conducted in an academic year before candidates appear for university examination.

b) Terminal examination at the end of first term - Theory 80 Marks and Practicals 80 Marks
   Preliminary examination at the second term - Theory 80 Marks and Practicals 80 Marks

C) Weightage of marks for internal assessment would be as follows –
   Terminal and Preliminary total theory marks 160, to be converted into 20 Internal assessment marks
   Terminal and Preliminary total Practicals marks 160, to be converted into 20 Internal assessment marks

d) Candidates have to secure minimum of 35% marks in Internal assessment combined in theory and Practical to be eligible to appear for University examination.

**HUMAN PHYSIOLOGY**

Didactic- 140 hrs
**Goal**

The broad goal of Physiology for Physiotherapy course is to comprehend the functions of human body in view of integration with other subjects, to be able to apply in terms holistic management of the patients as a qualified physiotherapist.

**Objectives**

**I. Knowledge Domain:**

1) To know about the principles related to maintenance of body equilibrium and composition.

2) To understand the basic mechanism operating across the biological membrane.

3) To understand the functional mechanisms of each organ system.

4) To understand interaction and integration of different organ systems in health and diseases.

5) To understand the influence of various environmental factors including personal stressors like exercise on the organ systems.

**II. Skill Domain:**

1) To be able to perform the tests or techniques to evaluate the functions of organ systems.

2) To be efficient to handle the equipment related to these tests.

3) To be able to derive, analyze, interpret the test results.

4) To be able to differentiate the normal and abnormal test results.

5) To be able to present the facts in a precise manner regarding knowledge and skill acquired.

**Syllabus**

**General physiology**

- Introduction to physiology
- **Level 2**-
  - Concept of osmolar and tonicity units
  - Measurements to determine body fluid compartment

- **Level 3**-
  - Patch-clamp technique – tool to study ionic channels – overview

**Nerve muscle physiology**

- Structure of neuron
- Classification of nerve fibers, properties of nerve fibers
- Action potential and propagation of nerve impulse
- Velocity of nerve impulse
- Physiology of neuromuscular transmission
- Comparative organization and classification of muscles
- Structure of skeletal muscle – sarcomere
- Excitation contraction coupling
- Molecular basis of muscle contraction, changes during muscle contraction, types of muscle contraction, length – tension relationship, Energetics of muscle contraction

- **Level 2**-
  - Sub types of skeletal muscle fibres
  - Common disorders of neuromuscular transmission
  - Nerve conduction studies, EMG
  - Degeneration and regeneration of neuron
  - Compound action potential, concept of muscle tone

- **Level 3**-
  - Recording of action potential
  - Mechanism of action of neuromuscular blockers, muscular dystrophies.
Blood-
- Composition & functions of Blood
- Plasma, Plasma proteins-Types, values, Functions
- Haemopoiesis-Formation of formed elements.
- Erythrocytes-Morphology of RBC, Functions
- Hemoglobin- Functions
- Blood group-ABO, Rh system
- WBC-Classification & function, Normal values

- Level 2 -
- Anaemias
- Basic concept of immunity
- Platelets-Formation, structure, function
- Coagulation-Intrinsic & Extrinsic mechanisms
- Anticoagulants

- Level 3-
- Autoimmune diseases, Immunodeficiency syndrome
- Haemophilia, Purpura
- Blood Transfusion
- Blood Banking, Hazards
- ESR, PCV, Blood Indices

Cardiovascular system
- General organization, Cardiac properties
- Junctional tissues of the heart, Pacemaker potential
- Origin and spread of cardiac impulse
- ECG – leads, waves, intervals in ECG
- Cardiac cycle, pressure volume changes, jugular venous pulse tracing, heart sounds
- Cardiac output and regulation
- Blood pressure – determinants of BP, short term and long term regulation
- Capillary circulation and exchange
- Local control of blood flow and principles of hemodynamics
- Coronary circulation, Definition and types of shock

- Level 2-
- Hemodynamics, capillary hemodynamics
- Pathophysiology of edema
- Stages and mechanism of shock, methods of measurement of cardiac output
- Cardiorespiratory changes with exercise, fitness, fatigue

- Level 3-
  - Axis deviation, vector analysis, arrythmias, premature ventricular contractions, ectopics
  - Heart failure, treatment of shock
  - Common congenital heart diseases, valvular heart diseases, cardiac murmurs.

Respiratory system

- Organization of respiratory system
- Non respiratory functions of RS
- Mechanism of breathing, ventilation, types
- Muscles of respiration and framework of chest cavity
- Pressure in the thoracic cavity
- Compliance, surfactant, airway resistance
- Lung volumes and capacities, dead space
- Ventilation–perfusion ratio, pulmonary circulation
- Exchange of gases across respiratory membrane
- Transport of gases in the blood
- Regulation of respiration – Neural & Chemical

- Level 2-
  - Respiratory adjustment in relation to environmental factors – high altitudes, deep sea
  - Artificial respiration
  - Pulmonary function tests, concept of p50
  - Oxygen therapy and hazards of cyanosis

- Level 3-
  - Methods of determination of dead space, RV, FRC
  - Positive pressure breathing
  - Common disorders and diseases

Gastro-Intestinal System

Functional Organization of GIT
- Functions of saliva
- Functions of stomach
- Functions of Liver, Gall Bladder, bile
- Movements of GIT, Small Intestine, Large Intestine

  **Level 2**

- Gastric and pancreatic secretions
- Basis & types of Jaundice
- Overview of G.I.hormones

  **Level 3**

- Enteric nervous system
- Enterohepatic circulation
- Defecation reflexes

**Excretory system**

- Functional organization
- Structure of nephron
- Peculiarities of renal circulation
- Functions of kidney and Glomerular membrane
- JG apparatus
- Glomerular filtration

  **Level 2**

- Principle of tubular function
- Counter current system
- Micturition reflex

  **Level 3**

- Acid-base balance
- Cystometrogram
- Concept of renal clearance

**Temperature regulation**

- Skin and appendages – structure & functions
- Heat loss, Heat gain
- Role of hypothalamus in regulation of body temperature

  **Level 2**

- Fever

  **Level 3**
• Hyperthermia, hypothermia

**Endocrinology**

- Introduction to endocrinology
- Hypothalamic – pituitary control
- Pituitary hormones (ant and post pituitary)- effects and regulation
- Thyroid hormone effects and regulation
- Parathyroid hormone -effects and regulation
- Adrenal cortical hormones- effects and regulation
- Pancreatic hormones -effects and regulation

- **Level 2**-

  - Disorders of pituitary hormones ,thyroid hormone, parathyroid hormone, adrenal cortical hormones and pancreatic hormones
  - Calcium homeostasis and vitamin D metabolism

- **Level 3**-

  - Physiology of growth and development
  - Process of Aging

**Reproductive System**

- Introduction and differential organization of male & female systems
- Puberty, menopause
- Spermatogenesis
- Menstrual cycle- Ovarian changes,
  Endometrial changes - ovulation

- **Level 2**-

  - Sex hormones – effects & regulation

  - Secondary sexual features
  - Pregnancy, parturition, lactation
  - Physiological changes during pregnancy
  - Functions of placenta

- **Level 3**-

  - Sex determination, differentiation
  - Composition of semen
Nervous System

- General introduction & organization
- Divisions –Central Nervous system, Peripheral Nervous system–
  Spinal cord and Brain stem including Functions of cranial Nerves.
  Gray matter, white matter
- Synapse, Neuron classification., neurotransmitter(brief)

**Sensory-**
- Receptors-classification
- Sensory modalities
- Physiology of Pain
- Ascending tracts ,sensory cortex
- Reticular activating system, thalamus

**Motor-**
- Motor unit ,muscle tone,
- Muscle spindles
- Descending tract, motor cortex
- Reflex action-classification with examples
- Cerebellum –connections, functions
- Basal ganglia –connections, functions
- Hypothalamus – connections, functions

**Autonomic Nervous System-**
- Sympathetic & parasympathetic (brief)

**Higher functions-**
- Cerebral cortex in detail, speech, sleep, EEG
- Learning &Memory, limbic cortex, emotions, CSF, Blood brain
  barrier,cerebral blood flow

--- **Level 2-**

- Properties of receptors, reflexes, synapses
- Structure of spinal cord, cerebral cortex in detail
- Neurotransmitters in detail, neuromodulators
- Endogenous pain inhibition
- Theories of referred pain
- Mechanism of posture and equilibrium –static and dynamic
- Spinal transaction/hemi section, Brown Sequard syndrome
  ,syringomyelia
- UMN , LMN ,Cerebellar lesions, lesions of basal ganglia Horner’s
  syndrome
- **Level 3-**
  - Limbic system
  - Sleep disorders, Aphasia, Epilepsy, Amnesia, Dementia

**Special senses**

**The eye/vision-**

- Structure of the eye
- Optics of vision
- Errors of refraction

- **Level 2-**
  - Field of vision, perimetry
  - Dark/light adaptation
  - Visual pathway

- **Level 3-**
  - Colour vision, colour blindness

**The ear /Hearing-**

- Structure of the ear
- Functions of middle ear
- Vestibular apparatus

- **Level 2-**
  - Cochlea - Organ of corti
  - Tests for deafness
  - Posture and equilibrium

- **Level 3-**
  - Auditory pathway
  - Mechanism of hearing

**Taste and smell-**

- **Level 2**
  - Taste buds
- Taste pathway
- Olfactory epithelium
- Olfactory pathway

**PRACTICALS**

1) Haematology-(demonstration only)
   - RBC count, WBC count, Differential count, Bleeding and clotting time, Hemoglobin estimation, ABO and Rh Blood Group, PCV, ESR, Calculation of blood indices.

2) Graphs-
   1. Skeletal muscle-properties.
   2. Cardiac muscle-properties, effect of Ach & Adrenaline.

3) Physical fitness-
   1. Breathe holding.

4) Blood pressure-effect of change in posture and exercise.

5) Stethography
   1. Effect of deglutination.
   2. Voluntary hyperventilation.

6) Spirometry
   1. Lung volumes.
   2. Timed vital capacity.

7) Mosso’s finger ergography.

8) Perimetry.

9) Clinical examination
   - Respiration, CVS, Higher functions, memory, time, orientation, reflexes, motor & sensory system, abdomen.
**TEXT-BOOKS**

1) Concise physiology - Chaudhari.
2) Understanding physiology - Bijlani.
4) T.B. of Physiology – 2 vol.- A.K.Jain
5) Practical physiology - V.D.Joshi
6) T.B. of practical physiology A.K.Jain

**SCHEME OF EXAMINATION**

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

THEORY-80 MARKS + INTERNAL ASSESSMENT-20 MARKS = Total 100 marks

**Model Question Paper**

**Section-A**

**MCQ - q-1** Single best answer (All topics) [20 x 1]

20 marks

1. General Physiology - 2,
2. Muscle-Nerve-2,
3. Blood – 2,
4. CVS – 2,
5. RS – 2,
6. END/Reprod- 3,
7. CNS – 3,
8. GIT – 1,
9. Environmental – 1,
10. Renal – 1,
11. Special senses – 1.

**Section B:**
SAG 9-2] To attempt any SEVEN out of Eight - [7 x 2] 14 marks

   a. Gen. Physiology
   b. Muscle/ Nerve
   c. Blood
   d. GIT
   e. Renal
   f. Endocrine
   g. Reproductive
   h. Applied (CVS/RS)

9.3] Short Notes any FOUR out of Five [4 x 4] 16 marks

   a. Environmental
   b. Special senses
   c. Higher functions /ANS
   d. Case studies (M-N/CNS)
   e. Body fluid compartment

Section C:

9.3] Attempt any three long answer questions out of the following. (10 x 3) = 30

A. Muscle – Nerve Physiology.
B. CNS
C. CVS
D. RS

(break up of each LAQ should be given)

2] Practical- 80 Marks +Internal Assessment 20 Marks = 100

Practical Examination Pattern Total = 80
1] Spots-based on 1 to 8 mentioned in practical syllabus [5x3]- 15 marks

1) Haematology,

2) Skeletal muscle experimental graphs

3) Cardiac muscle experimental graphs

4) Human experiments including perimetry, ergography, stethography & spirometry

5) Clinical: ECG report, BP apparatus, tuning fork, knee hammer & Weber’s compass

2. Clinical exam 4 X 10 mks = 40 mks

i. CVS – pulse examination, BP recording, chest examination- inspection, palpation, percussion, auscultation – 10 mks

ii. Respiratory system - chest examination- inspection, palpation, percussion, auscultation – 10 mks

iii. Nervous system –
   a) Sensory motor examination – superficial & deep sensations, muscle tone, grading of muscle power, nutrition of muscle - 10 mks
   b) Reflexes, cranial nerves- emphasis on taste, smell, hearing, vision & trigeminal – 10 mks

3. Demo table viva /Charts/Graphs 20 mks

4. Lab. Journal 05 mks

INTERNAL ASSESSMENT (I.A.)

One Terminal & one Prelim having 80 marks each in theory & practical. I.A. marks out of 20 for theory & 20 for practical.

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

BIOCHEMISTRY

[40 hrs-Didactic only]
GOAL

The broad goal of the teaching of undergraduate students in Biochemistry aims at providing comprehensive knowledge of the Human Biochemistry to provide a basis for understanding the clinical correlation & diagnosis of biochemical disorders.

OBJECTIVES:

At the end of the course, the student should be able to describe:

1. Structure, functions of cell in brief.
2. Normal functions of different components of food
5. The basic and clinical aspects of enzymology and regulation of enzymatic activity.

Syllabus

1. CELL BIOLOGY
   - Level 2:
     - Plasma Membrane- structure and its functions.
     - Junction of intracellular organelle in brief (no structural details).

2. CARBOHYDRATES- CHEMISTRY AND METABOLISM
   - Definition, Classification (with proper examples) and their functions.
   - Glycolysis (Aerobic and Anaerobic), TCA and their energetics.
   - Synthesis and break down of glycogen and its regulation biochemical importance.
   - Level 2:
     - Biochemical aspects of digestion and absorption of carbohydrates.
     - Significance of HMP shunt and Gluconeogenesis.
     - Hormonal regulation of blood sugar, Diabetes mellitus.

   - Level 3:
     - Metabolic disorders of Glycogen metabolism, Lactose intolerance.
3. PROTEINS - CHEMISTRY AND METABOLISM

- Definition, Various ways of Classification (with proper examples) proteins, amino acids, peptides & their biochemical importance, Denaturation, coagulation, isoelectic pH and its significance.
- Fate of amino acids in the body (deamination, Transamination, transmethylation), fates of ammonia and urea cycle.

   - Level 2:

- Biochemical aspects of digestion and absorption of proteins.

4. LIPIDS - CHEMISTRY AND METABOLISM

- Definition, Classification (with proper examples) and functions of Lipids and fatty acids. Biochemical aspects of digestion and absorption of lipids.
- Beta oxidation of fatty acids and its energetics, ketogenesis, ketolysis & ketosis.

   - Level 2:

- Cholesterol and its importance (No biosynthesis)
- Classification and functions of Lipoproteins.
- Fates of- acetyl CoA and glycerol.

5. NUCLEIC ACIDS

- Definition, Structure & functions of DNA, RNA, Nucleotides & their biological importance.

   - Level 2:

- Catabolism of purines and related disorders.

6. ENZYMES

- Definition, Classification of enzymes, Factors affecting enzyme activity
• Enzyme inhibitors (kinetic is not required), diagnostic clinical importance of enzymes & Isoenzymes.

- Level 2:
• Diagnostic uses of enzymes.

7. VITAMINS
• Classification, sources, functions and RDA of fat soluble and Water soluble vitamins.
• Active forms & metabolic role, deficiency manifestations.
• Co-enzymes forms of vitamin B- complex group.
  - Level 3:
• Hypervitaminosis

8. BIOLOGICAL OXIDATION
Level 2:
• Electron transport chain.
• Substrate level & oxidative phosphorylation.

9. MINERAL METABOLISM
- Level 2: Study of -
• Calcium & Phosphorus, Chloride, Copper & Iodine
• Iron, Manganese, Selenium, Zinc & Fluoride.

10. WATER, ELECTROLYTES AND ACID- BASE
- Level 2:
• Sodium, Potassium and their importance in body.
• Balance & imbalance of Water, Electrolytes.
• Acid-Base Balance and imbalance.

11. HORMONES
• Definition, Classification.
• Mechanism of hormone action.

12. MUSCLE CONTRACTION
• Contractile elements
• Biochemical events during contraction
• Energy metabolism in skeletal and cardiac muscle

13. CONNECTIVE TISSUE

• Biochemistry of connective tissues

14. NUTRITION

• Importance of nutrition.
• Calorimetry, Respiratory quotient and its significance
• Energy requirements with reference to age, sex.
• Thermogenesis, Specific dynamic action.
• Balance diet for normal adult and role of fibers in diet.
  - Level 2:

• Nitrogen balance and its significance.
• Protein energy malnutrition (Kwashiorkor & Marasmus).

15. CLINICAL BIOCHEMISTRY

- Level 2:

• Liver function tests and renal function tests
• Relevance of blood levels of glucose, urea, calcium, phosphorus and uric acid.
• Enzymes- Amylase, CPK, LDH and its isoenzymes.
• Lipid profile- triglyceride, cholesterol (HDL, LDL & VLDL)
• Proteinuria & glycouria.

Text books

1. Essentials of Biochemistry, 1st Edition : Dr. Pankaja Naik
2. Essentials of Biochemistry 7th Edition: Dr. DM Vasudevan

SCHEME OF EXAMINATION- [THEORY ONLY]
Student should get minimum 50% marks for passing the examination.

THEORY-40 MARKS + INTERNAL ASSESSMENT-10 MARKS
Section A

MCQ - Q-1] Single best answer (All topics) [10 x 1] 10 marks

Section B:

SAQ Q-2] To attempt any SEVEN out of Eight - [7 x 2] 14 marks


Section C:

Q.3] Short Notes any FOUR out of Five [4 x 4] 16 marks

(Chemistry and metabolism of Carbohydrates, Lipids and Proteins, Enzymes, Vitamins, Hormones, Connective tissue, Muscle contraction).

Internal assessment examinations

a) Two Internal assessment examinations shall be conducted in an academic year before candidates appear for university examination.

b) Terminal examination at the end of first term - Theory 40 Marks

Preliminary examination at the second term - Theory 40 Marks and

c) Weightage of marks for internal assessment would be as follows –

Terminal and Preliminary total theory marks 80, to be converted into 10 Internal assessment marks

d) Candidates have to secure minimum of 35% marks in internal assessment in theory to be eligible to appear for University Examination.
FUNDAMENTALS OF EXERCISE THERAPY

DIDACTIC 100 HRS
PRACTICAL/LABORATORY 180 HRS
Total 280 hrs

Objective-

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

1] Define the various terms used in Mechanics, Biomechanics & Kinesiology, Recall the basic principles of Physics related to mechanics of movement/motion

2] Describe & acquire the skill of use of various tools of the Therapeutic gymnasium


4] Acquire knowledge of different starting & derived positions

5] Acquire the skill of application of various massage manipulations & Describe Principles, Physiological effects, Therapeutic use, Merits & Demerits.


7] Acquire knowledge & skill of Relaxation

8] Describe the skill & significance of Group & Recreational Exercises & their Advantages & Disadvantages

9] Be able to describe Principles of Yoga, its types, its physiological & psychosomatic effects & demonstrate standard yoga postures used by the beginners

10] Be able to demonstrate General Fitness exercises & understand principles of General Fitness

Syllabus-

1] General Biomechanics 35 hrs

- Force – Analysis of Force
- Internal & External force, Resolution of force, force vectors, force systems
- **Level 3-** Calculation of force: Parallelogram of forces, use of coordinates
- Mechanics of Position-Gravity, Center of Gravity, Line of Gravity, Base of support, Equilibrium, Fixation & Stabilisation
- **Level 3-** deviations with respect of centre of mass, line of gravity & stability
- Introduction to statics & dynamic, Newton laws of motion
- Mechanics of Movements- Axes & Planes, Speed, velocity, work, mechanical advantage, energy, power, acceleration, Momentum, Inertia & Friction,
  - **Level 3-** friction types
- Simple Machine -
  a) Levers – Types, mechanical advantage & Uses, Angle of Pull
  b) Pulleys- Types (single & multiple) mechanical advantage & Uses
  c) Pendulum
d) Elasticity – Springs, stress, strain, Hooke’s Law
  - **Level 2-** behavior under stress
- Types of muscle work

2] **Starting & derived positions**

- Description of position, Muscle Work & Effects & Uses:
- Lying, sitting, kneeling, standing, hanging, positions derived by moving arm, legs & trunk
  - **Level 3-** positions in water

3] **Movement**

- Classification, Principles, Techniques & Uses
  - **Level 3-** trick movements

4] **Range of Motion** –

- Goniometry (Technique, Uses & Types of Goniometry)
  - **Level 2-** Other methods of range of motion assessment (tape)
  - **Level 3-** trick movements, range of motion of spine especially lumbar & cervical,
- Inclinometer, motion analysis, C-ROM, B-ROM

5] **Limb length measurement** (only lower limb - apparent, true)

  - **Level 2-** supra- trochanteric)
  - **Level 3-** other methods, clinical aspects
- girth measurements: upper limb & lower limb(tape)
- **Level 2**- volumetric assessment, girth measurements of fingers
- **Level 3**- girth measurements of ankle 10 hrs

6] **Assessment of Sensations & Reflexes,**

- **Level 2**- assessment of sensations dermatome wise & peripheral nerve distribution, monofilament testing, algometer
- **Level 3**- grades of deep tendon reflexes, clinical application in UMN & LMN lesion

**Blood Pressure, Pulse Rate, Respiratory Rate & Chest Expansion (in normals)**

- **Level 3**- Blood Pressure, Pulse Rate, Respiratory Rate & Chest Expansion

Variations in normal & abnormal 10 hrs

7] **General Relaxation**

Principles, methods & effects/ uses

- **Level 2**- Biofeedback
- **Level 3**- clinical applications

8] **Introduction to Manual Therapy***

i) Peripheral joint mobilization- accessory movements, oscillations, concave-convex rule

ii) Soft tissue mobilization- Massage (Principles, Classification, Effects, Merits, Demerits, Skills on extremities, scalp, spine, abdomen, face).

- **Level 2**- Myofascial release, muscle energy technique,
- **Level 3**- Cyriax 20 hr.

9] **Therapeutic Gymnasium**

Suspension Therapy- Principles, Types, Technique & Uses. Use of accessories such as pulleys, springs, shoulder wheel, finger ladder, therapeutic ball, parallel bars, wall bar, knee ratchet, medicine ball, ergo cycle, wheelchair, ambulatory aids, quadriiceps table, tilt table, rope & pulley, kanavel table, therabands, weighted cuff, wobble board, ankle exerciser, wands, mats, bolster, stability trainer, trampoline, compensation blocks, etc with applied biomechanical principles.

- **Level 3**- clinical applications

10] **Group Exercises & Recreational Activities** 10 hrs
Principles, Merits & Demerits.

- **Level 2** - progression, muscle loading and home exercise

### 11] General fitness exercises - 40 hrs

- Principles & Technique (Warm up-stretching -mobility- strengthening cool down)

- **Level 2** - FITT principle, target heart rate calculation, Karvonen’s formula

### 12] Yoga: 40hrs

1. Yoga- Definition, Introduction, Basic types
2. Classification of yoga- Ashtanga Yoga
3. Introduction to Kriyas- definition, types & Benefits
4. Basic yogic terms- aadharasana, bandha, mudra, Conscious Differential Relaxation (CDR), Unconscious Differential Relaxation (UDR)
5. Introduction to Pranayama- types, benefits, Contra indications
6. Introduction to Asanas- definition, stages, principles, effects
7. Basic yogic practices-
   a. Sitting: Padmasana, Paschimotanasana, Vajrasana, Yogamudra
   b. Standing: Trikonasana, Hastapadasana, Tadasana
   c. Supine: Pavanmuktasana, Sethubandhasana, Shavasana
   d. Prone: Bhujangasana, Ardhashalabhasana, Shalabhasana, Dhanurasana.

- **Level 3**-Kinetics and kinematics

### 13] Hydrotherapy 5hrs

- Principles (Hydrodynamics), Description of the Tank, Application, Effects, Indications & Contraindications

- **Level 3**-Special techniques in water, equipments, water birth

**PRACTICAL**-

Skills included in sr.no.2 to 12 above to be practiced on self & models

*In topic no. 8 only massage to be included in practical’s

**TEXT BOOKS**

1] Principles of Exercise Therapy–Dena Gardiner

2] Massage- Holley & Cook

3] Practical Exercise Therapy—Margaret Hollis

5] Joint structure and function- Cynthia Norkins

REFERENCE BOOKS

1] Therapeutic Exercise—Carolyn Kisner & Kolby

2] Physiotherapy in Orthopaedic conditions-by Jayant Joshi [for the study of Basic Yogic postures]

3] Yoga for Health & Peace- S. Nimbalkar

4] Massage for Therapists – M. Hollis

SCHEME OF EXAMINATION

Student should get minimum 50% marks for passing the examination

THEORY—80 MARKS + INT. ASSESSMENT—20 MARKS Total = 100 MARKS

Section-A

MCQ-Q-1]- based on Single best answer –[20x 1] 20 marks

Section-B-

SAQ -Q-2]- to answer any SEVEN out of Eight—[7 x2] 14 marks

Q-3]- to answer any FOUR out of Five—[4 x 4] 16 marks

Section C) Answer any 3 out of 4 (10 mks each) – 30 marks

Q. No. 4

Q. No.5

Q. No.6

Q. No.7

#- Break up of each LAQ should be given

PRACTICAL--80 marks + INT. ASSESSMENT--20 marks = TOTAL-100 MARKS
A] Long case-based on Goniometry/Passive movement/Starting & derived positions/ Sensation & Reflex Testing/aerobic conditioning

i] Cognitive-Bio-physics, Biomechanical principles, Indications,
    Contra-indications, Documentation of findings etc  20 marks

ii] Psychomotor & affective-skills  15 marks

B] a] Short Case – Any one of the following  20 marks
    Relaxation /Limb length/ Girth Measurement/Yoga posture /
    Warm up exercises / cool down exercises /Group Exercises/ Blood Pressure, Pulse Rate & Respiratory rate / Chest excursion & Expansion, /Massage /Suspension therapy

b] Spots-Based on Therapeutic Gymnasium [Four] [5x4]  20 marks

C] Journal  5 marks

INTERNAL ASSESSMENT (I.A.)
One Terminal & one Prelim having 80 mark each in theory & practical. I.A. marks out of 20 for theory & 20 for practical.

Student will be eligible to appear for University examination if he/ she get minimum 35% marks.
FUNDAMENTALS OF ELECTRO THERAPY

Didactic -100 hrs

Practical /laboratory-120 hrs

Total -220 hrs

GOAL

The broad goal of the teaching of undergraduate students in Fundamentals of Electro Therapy aims at providing comprehensive knowledge of the physics, principles & Laws of Electricity & Electro-magnetic spectrum, understand the fundamental principles and uses of various modalities based on the type of energy utilized by each. Analyze the relationship between wavelength and frequency for electromagnetic energy. To acquire skills required to practice and use superficial thermal agents.

OBJECTIVES:

A – Knowledge:

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

a. Understand the physics, principles & Laws of Electricity & Electro-magnetic spectrum
b. Describe in brief, certain common electrical components such as transistors, valves, capacitors, transformers etc
c. Describe the mains electrical supply, Electric shock & precautions, Basic electrical components & their functions
d. Explain the various ways electrical energy can be used to produce a therapeutic effect.
e. Enumerate types of currents & describe production of High Frequency, Medium Frequency & Low Frequency electrical currents.
f. Describe various types of electrodes used in therapeutics, describe electrical skin resistance & significance of various media used to reduce skin resistance
g. Acquire knowledge of various superficial thermal agents, their physiological & therapeutic effects, Merits & Demerits.
h. Describe effects of environmental & man-made electro- magnetic field at the cellular level & risk factors on prolonged exposure
D. Skills

At the end of the course the students shall be able to:

a. Describe the panel diagrams of the electrophysical agents used in physiotherapy practice.

b. Describe and identify various types of currents used in Physiotherapeutic practice.

c. Identify various types of electrodes used in therapeutics and demonstrate various media used to reduce skin resistance.

d. Acquire the skill of Application of the superficial thermal agents on models, for the purpose of Physiotherapy Treatment.

E. Integration

From the integrated teaching of other basic sciences, students shall be able to comprehend the fundamentals of electrotherapy and electrophysical agents and thus interpret the various ways superficial thermal agents can be used to produce a therapeutic effect.

Syllabus-

1] Physics And Basic Electrical Components 40 hrs


B. Rheostat- Types, Potentiometer, Ammeter, Oscilloscope, Transformer-Types, Capacitor, Inductor, Thermionic Valves, Transistors,

- **Level 2-** Pulse Generator – Astable Multivibrator

C. Mains Supply – Fuse, Plug, Switch, Wiring of the house, Dynamo.

Shock – Types, Effects, Precaution & Treatment

2] Cellular Biophysics 10 hrs

Reception & Emission of E.M.F. signals
3] E.M. spectrum

Wavelength, Velocity & Frequency. Laws governing Radiation.

4] Fundamentals of Low frequency currents

35 hrs

i] Types of Currents- applications in brief

ii] Characteristics of Currents – Pulse- Types of Pulses, Phase, Waveform, Interpulse interval & Frequency

iii] Polarity testing

iv] Types of electrodes, Galvanic Skin Resistance –Significance & Methods to reduce GSR

5] Fundamentals of Medium frequency currents

Physical Principles, Components of Panel, Testing of Apparatus-Interferential Therapy,
- **Level 2**- Russian currents

6] Fundamentals of High frequency currents—

55 hrs

i] Pulse Generator, Circuit of Short Wave Diathermy & Ultrasound Machine

ii] Physical Principles, Components of Panel, Testing of Apparatus–Continuous & Pulsed Short Wave Diathermy, Ultrasound, Ultra Violet Rays, LASER (Only

Physical Principles & Types)

iii] Hazards of environmental currents

7] Biophysics of Superficial heat

70 hrs

Physical principles, components of panel, Physiological effects, Therapeutic
Effects /uses, Merits & Demerits, Indications & Contra-indications.

Skills of Application in-

i] Paraffin wax bath,

ii] Whirl Pool,

iii] Contrast bath

iv] Hydro-collator / Hot packs

v] Infra Red

vi] Home remedies

PRACTICALS

1] Panel diagrams-Identification of components, Testing the mains supply & Machines

2] Skills of application of superficial thermal agents

TEXT BOOKS

1] Clayton’s Electro therapy – Kitchen-3RD Ed

2] Clayton’s Electro therapy – Kitchen-10th Ed

3] Electro therapy explained –by Low & Reed

4] Electrotherapy: Evidence Based Practice- Kitchen 11th Ed

REFERENCE BOOK

1] Principles & Practice of Electro Therapy –Joseph Kahn

2] Clinical Electro Therapy-by Nelson & Currier

3] Thermal Agents – by Susan L. Michlovitz

4] Principles & Practice of Electro Therapy- Dr Saeed Anwar
SCHEME OF EXAMINATION

Student should get minimum 50% marks for passing the examination

THEORY-80 MARKS, I.A.-20 MARKS;

THEORY- model question paper—[80 MARKS]

Section-A

MCQ-1 based on Single best answer – [20x 1] 20 marks

Section-B-

SAQ-2 to answer any SEVEN out of Eight—[7 x2] 14 marks

Q-3 to answer any FOUR out of Five—[4 x 4] 16 marks

Section C) Answer any 3 out of 4 (10 mks each) – 30 marks

Q. No. 4
Q. No.5
Q. No.6
Q. No.7

#- Break up of each LAQ should be given

PRACTICAL-80 MARKS +, I.A.-20 MARKS TOTAL = 100 MARKS

A] Long case-based on superficial thermal agent 35 marks

[Cognitive–Medical electronics, Physiological /Biophysical Principles, Therapeutic effects, Indications & Contraindications]

[20 marks]+ [Psychomotor + Affective- skills] [15 marks]
B] - ------------------------------------------------------------- 40 marks

a] Spots [Six] –5 Minutes per Spot-Identification of Electronic

   Equipment/ Component & Panel Diagram of any Two Equipments

   [5 x 6] [30 marks]

b] Testing of Equipment — SWD / Ultra Sonic / IFT / Stimulator,

   TENS Machine, Polarity Testing  [10 minutes] [10 marks]

C] Journal 5 marks

INTERNAL ASSESSMENT (I.A.)

One Terminal & one Prelim having 80 mark each in theory & practical. I.A. marks out of 20 for theory & 20 for practical.

Student will be eligible to appear for University examination if he/ she get minimum 35% marks.
## SCHEME OF EXAMINATION OF B. P.T – I

<table>
<thead>
<tr>
<th>Subject</th>
<th>Theory</th>
<th>Duration</th>
<th>I.A.</th>
<th>Total</th>
<th>Practical</th>
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<tr>
<td>ANATOMY</td>
<td>80</td>
<td>3 hours</td>
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<td>PHYSIOLOGY</td>
<td>80</td>
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<td>BIOCHEMISTRY</td>
<td>40</td>
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<tr>
<td>FUNDAMENTALS OF EXERCISE THERAPY</td>
<td>80</td>
<td>3 hours</td>
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<tr>
<td>FUNDAMENTALS OF ELECTRO THERAPY</td>
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<td>3 hours</td>
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Passing Criteria – 50 % of total marks each in theory & practical

Eligibility to appear for University exam – 35 % in Internal Assessment.
[This syllabus is applicable from 2014-2015 i.e.-from the batch

Who gets admitted to the I B.P.T. course in the year-2013-2014]

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Transcript Hours</th>
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<tbody>
<tr>
<td>1] Pathology</td>
<td>50 hrs</td>
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<tr>
<td>2] Microbiology</td>
<td>30 hrs</td>
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<td>3] Pharmacology</td>
<td>45 hrs</td>
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<td>4] Kinesiotherapeutics</td>
<td>300 hrs</td>
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<td>5] Electro- Physical Agents</td>
<td>28 hrs</td>
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<td>6] Psychology</td>
<td>40 hrs</td>
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<tr>
<td>Seminars</td>
<td>50hrs</td>
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<tr>
<td>Supervised Clinical practice</td>
<td>600 hrs</td>
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</tbody>
</table>

[To practice clinical skills under the supervision of Senior clinical staff at the O.P.D. set up & to maintain a Register /Log book in which the prescribed Case Histories & written assignments are to be documented & to obtain the signature from the respective section In-charge at the end of the assignment.]
PATHOLOGY
[DIDACTIC-50 hrs]

GOAL

The broad goal of the teaching of undergraduate students in pathology aims at providing comprehensive knowledge of the morbid anatomy, Histopathology, etiology and pathogenesis with the complications of various diseases to provide a basis for understanding the clinical correlation and the skills to practice as a qualified Physiotherapist.

Objectives- At the end of the course, the student will be able to-

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

1] a] General Pathology-

Cell injury-causes, mechanism & toxic injuries with special reference to Physical, Chemical & ionizing radiation.

b] Reversible injury [degeneration] - types, morphology, swelling, hyaline, fatty changes
c] Intra- cellular accumulation hyaline, mucin
d] Irreversible cell injury types of necrosis, apoptosis, calcification, dystrophic & metastatic.
e] Extra-cellular accumulation amyloidosis, calcification-Pathogenesis, morphology.
2] Inflammation & Repair:
   a] Acute inflammation-features, causes, vascular & cellular events
   b] Morphologic variations
   c] Inflammatory cells & mediators
   d] Chronic inflammation:-causes, types, non-specific & Granulomatous – with examples
   e] Wound healing by primary & secondary union, factors promoting & delaying healing process.
   f] Healing at various sites-including bones, nerve & muscle
   g] Regeneration & repair

   - Level-2

3] Immuno-pathology-[basic concepts]
   a] Immune system : organization, cells, antibodies, regulation of immune responses and Organ transplantation.

   - Level-3

   b] Hyper-sensitivity
   c] Secondary immuno-deficiency including HIV

4] Circulatory disturbances
   a] Edema-pathogenesis, types, transudates/exudates
   b] Chronic venous congestion-lung, liver, spleen
   c] Thrombosis-formation, fate, effects
   d] Embolism-types, clinical effects
   e] Infarction-types, common sites
   f] Gangrene-types, aetio-pathogenesis
   g] Shock-pathogenesis, types, morphologic changes

5] Deficiency disorders-Vitamin A, B, C, D.

6] Growth Disturbance
   a] Atrophy-malformation, agenesis, metaplasia, dysplasia, hypertrophy, hyperplasia
   b] Neoplasia, calcification, histogenesis, biologic behavior, difference between benign & malignant tumor
   c] Malignant neoplasms –grades, stages, local & distal spread
   d] Carcinogenesis-environmental carcinogens
   e] Chemical, Occupational, heredity, viral
   f] Precancerous lesions & Ca in situ
   g] Tumor & host interactions-systemic effects, metastatic or direct spread of tumors affecting bones, spinal cord leading to paraplegia etc.

7] Medical Genetics :
   a] Karyotypic abnormalities
   b] Mandelin disorders
   c] Inborn errors of metabolism
8] **Specific Pathology:**

A] **CVS**
   a] Arteriosclerosis-Ischemic heart diseases – angina, myocardial infarction
      Pathogenesis / Pathology
   b] Hypertension
   c] C.C.F.
   d] Rheumatic & Congenital H.D.

   - **Level-2**
     e] Peripheral vascular diseases

B] **Respiratory:**
   a] Obstructive Lung disorders
   b] Pneumonia [lobar, broncho, viral ] & restrictive lung disorders
   c] T.B.-primary, secondary, morphologic types
   d] plural diseases & complications
   e] respiratory failure

C] **Neuropathology**
   a] Reaction of nervous tissue to injury, infection & ischaemia
   b] Pyogenic meningitis, TBM, Viral infection
   c] Cerebro-vascular diseases-atherosclerosis-Thrombosis, embolism, aneurysm, hypoxia, infarction & hemorrhage
   d] Effects of Hypotension on CNS.
   e] Coma
   f] Leprosy, Demyelinating diseases, Parkinsonism, Cerebral palsy, Hemiplegia / paraplegia.
   g] Space occupying lesions
   h] Peripheral nerve injury

   - **Level 2:** metachromatic leucodystrophy, Dementia, Wilson’s disease.

9] **Muscle diseases**
   Muscular dystrophy, hypertrophy, Pseudo-hypertrophy, atrophy, Poliomyelitis, Myositis ossificans, necrosis, regeneration,

   - **Level 2:** Myotonia, hyperplasia

10] **Neuro –muscular junction:**
   Myasthenia gravis, Myasthenic syndrome,

   - **Level-2:** Lambert- Eaton Syndrome

11] **Bone & Joints:**
   Fracture healing, Osteomyelitis, Rickets, Osteomalacia, Bone tumors, Osteoporosis
b] P.I.D, Haemarthrosis, Gout, T.B.
c] Arthritis- degenerative, inflammatory, Rheumatoid, Ankylosing spondylitis & Tenosynovitis

12] Urinary–
- **Level-2**: Paralytic bladder, Common urinary tract infections , urinary calculi

13] G.I. system
- **Level-2**: Gastric/duodenal ulcer, Enteric fever, TB, Enteritis, Gastritis
  [related to consumption of NSAID]

14] Endocrine-
- Thyroid functional disorders, Diabetes Mellitus

15] Hepatic diseases-
- **Level-2**: Cirrhosis, emphasis to systemic effects of portal hypertension

16] Skin-
- **Level-2**: Melanin pigment disorders- Vitiligo, Psoriasis, cutaneous TB, Scleroderma, SLE.
- **Level-3**: Tenia vesicularis, Bacterial/fungal infections.

17] Clinical pathology [including Demonstrations]:
b] Muscle/skin/nerve biopsy
c] Microscopic appearance of muscle necrosis, fatty infiltration
d] Lab investigation in liver & renal failure

**TEXT BOOKS**
1] Text book of Pathology-by Harsh Mohan
2] Pathologic basis of disease by Cotran, Kumar, Robbins

**INTERNAL ASSESSMENT**—
One terminal & one preliminary in Pathology of 50 marks each - **Total-100 marks**
Internal Assessment marks to be calculated out of 10.
MICROBIOLOGY

DIDACTIC-30 hrs

Objectives- At the end of the course, the candidate will have sound knowledge of the agents responsible for causing human infections, pertaining to C.N.S., C.V.S., musculo -skeletal, & Respiratory system

Syllabus-
1] General Microbiology-
   Introduction & scope 1 hr
   - Level 2: nomenclature & taxonomy
   - Level 3: nobel laureates in microbiology

2] Classification of Microorganisms & morphology of Bacteria 1 hr
   - Level 2: Microscopy, staining techniques
   - Level 3: Bacteriocirs

3] Sterilization & disinfection –[basic concepts] 2 hrs
   Hospital acquired infection, universal safety precautions and waste disposal
   - Level 2: Testing of disinfectants.

4] Immunology 6 hrs
   i] Antigen-antibody—reaction & application for diagnosis
   ii] Immune response- normal/abnormal
   iii] Innate immunity & acquired immunity [vaccination]
   iv] Hyper-sensitivity
      - Level 2: auto-immunity
      - Level 3: Immune response- normal/abnormal

5] Laboratory Diagnosis of Infection 3 hrs
   - Level 2: sexually transmitted infections, Urinary tract infections
   - Level 3: Zoomatic infections, GI infections, pyrexia of unknown origin.

6] Bacteriology 8 hrs
   i] Infection caused by gram +ve cocci ;Gas gangrene, Clostridium, Diptheria
   ii] Infection caused by gram –ve cocci, ,
   iii] Mycobacterial infection- tuberculosis,
   iv] Syphilis-morphology & pathogenesis [VDRL]
      - Level 2: Typhoid Septicemia, cholera
      - Level 3: Leprosy, Atypical Microbacterium ,Shock, & Diarrhoea

7] Viruses 3 hrs
   i] Introduction & general properties,
   ii] HIV
   iii] Hepatitis
   iv] Polio, measles, , Herpes
- **Level 2**: congenital viral infections, Rubella, CMV, EB
- **Level 3**: prions, viral assays, chemotherapy of viral diseases.

8| **Mycology** 1hr
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Candidiasis
- **Level 2**: Mycetoma, Aspergillosis
- **Level 3**: Rhinosporidium, Cryptococcus.

9| **Parasites affecting C.N.S** 2 hr
---
Malaria, Filaria,
- **Level 2**: Toxoplasma,
- **Level 3**: Cystisarcosis & Echinococcus

10| **Applied Microbiology** 3 hr
---
As relevant to diseases involving Bones, Joints, Nerves, Muscles, Skin, Brain,
- **Level 2**: diseases involving Cardiopulmonary system & Burns

**TEXT BOOK**
Textbook of Microbiology- Dr. Baweja
Textbook of Microbiology- Dr. D.R. Arora

**INTERNAL ASSESSMENT**
One terminal & one preliminary Theory examination to be conducted of 30 marks each

**Total-60 marks**
Internal Assessment marks to be calculated out of 10

**SCHEME OF EXAMINATION- Pathology/ Microbiology [THEORY ONLY]**
Student should get minimum 50% marks for passing the examination
# Pathology 50 marks
Microbiology 30 marks
IA. 20 marks

**Total 100 marks**
# Emphasis to be given to topics related to Muskulo skeletal / Neurological / Cardiovascular/Respiratory conditions & Wound / Ulcers

**Section-A**
M.C.Q.-based on Single best answer
Q-1-based on Pathology [1 x15] 15 marks
Q-2-based on Microbiology [1 x 10] 10 marks

**Section-B**
SAQ-based on Pathology
Q3) -To answer any TEN out of TWELVE [10 X 2] =20 marks
Q4) -To answer any THREE out of FOUR [3x5] =15 marks

Section-C
S.A.Q-based on Microbiology
Q-5-Answer any FOUR out of Five [4 x 5] 20 marks

INTERNAL ASSESSMENT
Mentioned individually under Pathology & Microbiology.
Student will be eligible to appear for University examination if he / she gets minimum 35% marks
**PHARMACOLOGY**

**DIDACTIC- 45 hrs**

**Objective**- At the end of the course the candidate will be able to

1) Describe Pharmacology effects of commonly used drugs by patients referred for Physiotherapy .list their adverse reaction, precautions to be taken and contra – indication, formulation and route of administration.

2) Identify whether the pharmacological effects of the drug interferes with Therapeutic response of Physiotherapy & vise a versa

3) Indicate the use of analgesics & anti inflammatory agents with the movement disorders with consideration of cost efficiency &safety for individuals need.

4) Get the awareness of other essential &commonly used drug by patients –The basis for their use &common as well as serious adverse reaction.

**Syllabus**

1) **General Pharmacology**

Drug Pharmaco-kinetics, Pharmacology adverse reaction, Factors modifying drug effects, sources &routes of administration.

2) **Drug acting on CNS**

- Introduction, Alcohols, (1 hr)
- Sedatives &Hypnotics (1 hr)

- **Level 2:** Anti-convulsants (1hr)

- Analgesics & Antipyretics (1 hrs)
- Gout &R.A. (1 hrs)

- **Level 2:** Psycho Therapeutics (1 hr)
- General anaesthetic, Local anaesthetic (1 hr)
- Drug therapy in PARKINSONISM (1hr)
3) **Drugs acting on Autonomic nervous system** 4 hrs

i) Cholinergic Agonist (1hr)

ii) Cholinergic Antagonist (1hr)

iii) Adrenergic Agonist (1hr)

iv) Adrenergic Antagonist (1hrs)

4) **Skeletal muscle relaxants** 1 hrs

5) **Drugs acting on CVS** 8hrs

i) Hypertension (2hrs)

ii) Diuretics (1hr)

iii) CCF (1hr)

iv) Angina (1hr)

- **Level 2**: v) Antiarrythmia (1hr)
- **Level 2**: vi) Shock (1hr)
- **Level 2**: vii) Drug satisfying Homeostasis (1hr)

6) **Drug acting on Respiratory system** 2 hrs

1) cough & Bronchial asthma

7) **Chemotherapy** 5 hrs

i) General principles , Sulphonamides & Cotrimoxazole (1 hr)

ii) Broad Spectrum Antibiotics, Aminoglycides, Macrolides (1hr)

iii) Beta lactams, Quinolones (1 hr).

iv) Anti Tuberculosis (1 hr)

- **Level 2**: v) Anti leprosy (1 hr).

8) **Endocrine** 6hrs

i) Introduction (1 hr)

- **Level 2**: i) Thyroid & Antithyroid (1 hr)
- **Level 2**: ii) Estrogens + Progesterone (1hr)
iii) Steroids + Anabolic Steroids (1hr)

iv) Insulin & Oral anti diabetic drugs (1 hr)

v) Vitamin D Calcium, Phosphorus, Magnesium (1 hr).

9) Drugs acting on GIT

- Drug treatment of peptic ulcer including treatment of H.Pylori 1 hr
- Emetics & Antiemetics 1 hr

10) Haematinics, Vitamin B12, folic acid 1 hr

- Level 3:

TEXT BOOKS

1) Pharmacology by Gaddum

2) Pharmacology &Pharmacotherapeutics Revised 19th Edition 2005 by Dr.S.D.Satoskar & Dr.S.D. Bhandarkar

3) Pharmacology principle of Medical practice by Krantx,&Carr

4) Pharmacology basis of Therapeutic By Goodman L.S.Gliman A

5) Essential of Medical Pharmacology 5th Edition 2003 By Dr.K.D.Tripathi

SCHEME OF EXAMINATION

Theory – 40 marks

Internal assessment – 10 marks

Student should get minimum 50% marks for passing the examination

Section A

Q-1-M.C.Q. based on single best answer from must know area 10 marks

Section B

Q-2-S.A.Q-To answer any FIVE out of Six – (5 x 3) 15 marks

Section C
Q-3-S.A.Q-To answer any THREE out of Four (3 x 5) 15 marks

**INTERNAL ASSESSMENT**

One terminal & one Preliminary examination to be conducted of 40 marks each

TOTAL – 80 marks

Marks to be calculated out of 10.

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

Didactic - 125 Hrs
Practical/Laboratory - 175 Hrs
Total - 300 Hrs

Objectives-
At the end of the course, the candidate will be able to-

1] Understand biomechanics of joints of the skeletal system
2] Analyze Normal human posture [static & dynamic], Biomechanics of normal Gait and Activities of daily living
3] Describe the Biophysical properties of connective tissue & effect of mechanical loading & factors which influence mobility of articular & periarticular soft tissues
4] Apply the biomechanical principles for assessment & training methods for mobility, muscle strength & gait training.
5] Describe the physiological effects - Therapeutic uses, merits/demerits of various exercise modes.
6] Demonstrate various therapeutic exercises on self, & also acquire the skill of application on Models
7] Acquire the skill of assessment of isolated & group muscle strength/endurance & learn different strength/endurance training
8] Understand different techniques to improve pulmonary function.
9] Acquire knowledge of neural control and methods of training co-ordination & Balance

Syllabus

1] Biomechanics of joints of the skeletal system [spine, extremities, T.M. joint & Thoracic cage]
Kinetics and kinematics
   - Level 2: statics and dynamics
   - Level 3: structural dysfunction
2] **Kinetics & Kinematics of various Activities of Daily Living** - supine to sitting, sitting to standing, squatting, climbing up & down, lifting, pulling, pushing, overhead activities
   - **Level 3**: Pathomechanics

3] **Muscle Strength**
a] Assessment of muscle strength – subjective & objective methods [group & individual muscle testing as subjective & 1/10 RM & dynamometry as objective method], Trick movements (Vicarious movements)
b] Factors that influence the strength of the normal muscle, Changes seen in muscle after training – Hypertrophy, Hyperplasia
c] Types of muscle work – Isometric, Concentric & Eccentric, open chain, close chain, General principles of strength training:- Overload (Intensity, Duration & Frequency)/SAID/Motivation /Learning/ Reversibility /Specificity, skeletal muscle function and adaptation to resistance exercise, physiologic adaptations, determinants of resistance exercise
d] Training programme- Isokinetic, Isoinertial etc.

4] **Muscle Endurance**
a) Assessment of Muscle Endurance
b) Principles of Training
c) Training Programme
   - **Level 2**: periodization, intergration of function into resistance exercise program
   - **Level 3**: isokinetic exercise, PNF, special considerations in children, plyometric, use of equipments

5] **Mobility**
a] Mechanical behavior of connective tissue [contractile & non-contractile], Stress -Strain Curve, Elasticity, Plasticity, Creep, Hysteresis
b] Stretching – Types, Assessment, Principles, Techniques, Indications & Conra-indications
   - **Level 2**: types of contracture, Special consideration for self, mechanical application, Inhibition and relax procedures
c] Kaltemborn concept & technique (UPPER LIMB)
concave -covex rule, open pack & close pack, grades of traction, uses of grades, indication and contraindication
   - **Level 3**: Alternate techniques (UPPER LIMB)
d] Traction [cervical & lumbar]

6] **Posture** –
Normal Posture, Methods of Assessment of the Posture—Sitting /standing/ Lying, Physiological deviations of the posture
- Level 2: postural mechanism
- Level 3: correction of poor posture

7] Gait
a) Biomechanics of normal gait
   - Level 3: energy requirement, kinetics and kinematics of the trunk and upper extremity during gait, stair and running gait, abnormal gait

Methods of assessment of Gait (distance and time variables)
b) Walking Aids like axillary /elbow crutches, walking sticks, Tripod, Walker - Measurement, Pre-crutch training, Types of crutch gaits

8] Co-ordination & Balance- Neural control, Incoordination and causes, Methods & Principles of co-ordination exercises -Frenkel’s exercises
   - Level 3: exercise to promote movement and rhythm

9] Techniques to improve Pulmonary function
a) Breathing exercises—Biomechanics of respiration, Goals, Types—Inspiratory, Expiratory, Segmental. Forced expiratory Techniques-Huffing/ Coughing, Incentive Spirometry, Bladder Balloon flutter, peak flow meter
b) Postural drainage, Humidification, Nebulisation, Active cycle of Breathing (ACB),
   - Level 2: Autogenic drainage, , threshold loading device ,acapella, RC cornet device, PD for children and neonate
c) Postures to promote relaxation

10] Principles of Home programme

11] Introduction to Ergonomics (Definition and principles)

12] Functional Re-education
a] Lying to Sitting
b] Sitting Activities & Gait
c] Limb Activity

PRACTICAL

1) Manual Muscle Testing – Individual & Group

2) Mobility Techniques – Passive Stretching of Tight Muscles, Traction- Manual & Mechanical (only cervical), Hold Relax & Contract Relax Techniques, Kaltenborn techniques of application for upper extremity

3) Assessment of Posture

4) Assessment of Gait, Crutch Gaits
5) Co-ordination Exercises

6) Breathing Exercises, Postural Drainage Positions, ACB

7) Functional Re-education – Lying to Sitting, Sitting Activities & Gait, Limb Activities

TEXT BOOKS
1] Practical Exercise Therapy-by Margaret Hollis,
2] Therapeutic Exercise by Carolyn Kisner
3] Joint Structure & Function by Cynthia Norkins
4] Muscle testing by Kendall

REFERENCE BOOKS
1] Clinical evaluation - Lacote (for isolated assessment of abdominal muscles)
2] Orthopaedic Evaluation - Magee
3] PNF - Knott and Voss

SCHEME OF EXMINATION

Student should get minimum 50% marks for passing the examination
THEORY 80 marks
Internal assessment 20 marks

Total 100 marks

THEORY
Examination Pattern
(50% of question paper including section A, B & C should be based on biomechanics)

Section-A
Q-1]-M.C.Q.-based on Single best answer 20 marks
(20 minutes)

Section-B SAQ
SAQ -Q-2]- to answer any SEVEN out of Eight—[7 x2] 14 marks

Q-3]- to answer any FOUR out of Five—[4 x 4] 16 marks

* Section-C-L.A.Q
Section C) Answer any 3 out of 4 (10 mks each) – 30 marks
Q. No. 4
Q. No.5
Q. No.6
Q. No.7

#- Break up of each LAQ should be given

**PRACTICAL 80 marks**
I.A 20 marks
Total-100 marks

**PRACTICAL**

A] **One long case** - based on muscle strength/mobility/ Pulmonary function training -35 marks

[Cognitive –kinesiological & /or Physiological principles of application,, Indication & contraindications of skills (20 marks)
+ Performance of skills & home Exercise, Ergonomic advice, Methods of Documentation etc [Psychomotor & affective]-{15 marks}]

B] **Short Case I & II Each of 20 marks** 40 marks

Short Case I based on MMT/ Posture/Gait
Short Case II based on Co-ordination/ Functional-Re-ed/Breathing exercises/Postural drainage

C] Journal 5 marks

**INTERNAL ASSESSMENT**–

One terminal & one preliminary of 80 marks each in Theory & Practical Marks to be calculated out of 20 each in theory & practical.

**Student will be eligible to appear for University examination if he/ she gets minimum 35% marks**
ELECTRO - PHYSICAL AGENTS

Objectives:
At the end of the course, the candidate will be able to –
1. Describe the Physiological effects, Therapeutic uses, Merits/Demerits, Indications & Contraindications of various Low, Medium & High Frequency currents.
2. Describe the Physiological effects & therapeutic uses of various therapeutic ions & topical pharmaco-therapeutic agents to be used for the application of Iontophoresis & Phono phoresis
3. Acquire the skill of Application of the Electro therapy modes on models, for the purpose of Treatment
4. Acquire an ability to select the appropriate mode as per the tissue specific & area specific application

Syllabus-
1] Direct current (Constant) –
Polarity Testing, Physiological & Therapeutic Effects Of D.C.& Safety measures,
   - **Level 2:** Cathodal /Anodal Galvanism, Iontophoresis using various ions & pharmacotherapeutic drugs- Effects & concentration of Ions, Tap water Iontophoresis

2] Low Frequency Currents-
Physiological & Therapeutic Effects/ Uses of Faradic-type Current, Techniques Of Application
Interrupted Direct Current – Pulse Duration & Type of Pulse, Physiological & Therapeutic Effects/ Uses of Interrupted D.C., Technique of Application, Definition & Stimulation of Motor Points on Models
T.N.S.- Types, Physiological Effects & Uses, Techniques of Application, Contra Indications High Voltage Pulse galvanic currents - Physiological Effects & Uses, Techniques of Application, Contra Indications Didynamic currents - Physiological
3] Medium Frequency Currents-
Electro Physiological Effects & Uses, Contra Indications, Techniques of Application, Endovac attachment, Advantage of I.F.T. over low frequency currents
   - Level 2: Russian current

4] Electro Magnetic Fields-
Production of Heat, S.W.D.-Continuous/Pulsed, Physiological Effects & therapeutic effects, Contraindications, Techniques of Application, Types of Electrodes.
   - Level 3: Long Wave Diathermy

5] Therapeutic Ultra Sound-pulsed/continuous, Physiological Effects & therapeutic effects, Contra Indications, Techniques of Application
   - Level 2: Dosimetry

6] Ultra Violet Rays
Types of UVR, Physiological & Therapeutic Effects, Contra Indications, Test dose, Local & General Applications

7] Laser
Properties, Types of Cold Laser, Physiological & Therapeutic Effects, Contra Indications

8] Cryotherapy

9] Care of wound
Application of Electro-Physical Agents like Therapeutic currents, Ultrasound, U.V.R. & LASER, etc.

10] Bio-Feedback-methods

PRACTICAL
Skills of application to be practiced on models-in Low Frequency (including Microcurrent), Medium Frequency, SWD, Ultra Sonic, Ultra Violet Rays, Laser, Cryotherapy & care of wound

TEXT BOOKS
1] Clayton’s Electro therapy – Kitchen-3RD Ed
2] Clayton’s Electro therapy – Kitchen-10th Ed
3] Electro therapy explained –by Low & Reed
4] Electrotherapy: Evidence Based Practice- Kitchen 11th Ed

REFERENCE BOOK
1] Principles & Practice of Electro Therapy –Joseph Kahn
2] Clinical Electro Therapy-by Nelson & Currier
3] Thermal Agents – by Susan L. Michlovitz
SCHEME OF EXAMINATION

Student should get minimum 50% marks for passing the examination
THEORY 80 MARKS
I.A. 20MARKS

TOTAL 100 MARKS
THEORY
Model question paper

Section-A
M.C.Q- Q-1] based on Single best answer- [20x1] 20 marks

(20 minutes)

Section-B
SAQ -Q-2]- to answer any SEVEN out of Eight—[7 x2] 14 marks

Q-3]- to answer any FOUR out of Five—[4 x 4] 16 marks

Section-C

Section C) Answer any 3 out of 4 (10 mks each) — 30 marks

Q. No. 4

Q. No.5

Q. No.6

Q. No.7

#- Break up of each LAQ should be given
PRACTICAL - 80 MARKS  I.A. - 20 MARKS  Total - 100 MARKS

PRACTICAL

A] Long case- Stimulation of Motor points /Cryotherapy/ Faradism under pressure/Care of wound/ Skill of Application of IFT - 35 marks
i] Cognitive-Medical electronics/Physiological principles/ Indications Contraindications

ii] Skill-[Psychomotor & affective] 20 marks

B] Short Case I & II Each of 20 marks 40 marks
Short Case I - Based on Skill of Application of SWD, US, UVR for treatment purpose, U.V.R. test dose
Short Case II - Based on Skill of Application of TENS, Faradic current(except faradism under pressure), Tap water Iontophoresis, Laser

C] Journal 5 marks

INTERNAL ASSESSMENT
One terminal & one preliminary of 80 marks each in Theory & Practical. Marks to be calculated out of 20 each in theory & practical.

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

At the end of the course, the candidate will

1] Be able to define the term Psychology & its importance in the Health delivery system, will gain knowledge of Psychological maturation during human development, growth, & alterations during aging process

2] Be able to understand the importance of psychological status of the person in health & disease, environmental & emotional influence on the mind & personality

3] Acquire the knowledge as to how to deal with the patient

Syllabus

1] Developmental Psychology & its Theories Physio-psychological changes during infancy, early & middle childhood, adolescent stage, Puberty, adulthood & old age

2] Definition of Psychology, its nature-fields & Branches of psychology

3] Schools of thought –Psycho-analytical theory, Behaviorism, Gestalt, Structuralism, Functionalism

4] Learning-Role of learning in human life, Conditioning

5] Emotions-nature & relationship with autonomic nervous system-

   Theories of emotions

   - **Level 2:**
     
     a] James Lange theory

     b] Scatter Singer theory
c] Cannan Bard theory

6] Memory-types, Forgetting, causes of forgetting


8] Personality Types-Common defense mechanism, stress, common reactions to frustrations.
   - Level 2: Conflict & Frustration

9] Abnormal Psychology -
   a] Introduction
   b] Difference between normal & abnormal psychology
   c] Types & causes of abnormal psychology
   - Anxiety disorders- Phobias, Obsessive–compulsive disorder, Hysterical convulsion disorder
   - Affective disorders-depression, mania, bipolar disorders
   - Psychotic disorders-Types of Schizophrenia
   - Level 2: Management of abnormal psychology

TEXT BOOKS

1] Introduction to Psychology by Morgan C.T. & King R.A.- -7th edn [Tata McGraw-Hill publication

2] Introduction to Psychology by Munn N.L.- [Premium Oxford, I.B.P. publishing co.]

3] Cognitive Psychology In and Out of the Laboratory Kathleen M. Galotti

4] Developmental Psychology: A Life-Span Approach by Elizabeth B. Hurlock

SCHEME OF EXAMINATION (Theory only)
Student should get minimum 50% marks for passing the examination

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<th>Marks</th>
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<td>THEORY</td>
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Section-A

**Q-1-MCQs**—Based on Single Best answer 10 marks

(10 minutes)

Section-B

**Q-2-SAQ**—to answer any FIVE out of Six---[5 x 3] 15 marks

Section-C

**Q-3-SAQ**—to answer any THREE out of Four—[3X5] 15 marks

Internal Assessment (I.A).

One Terminal & one preliminary Theory examination of 40 marks each to be conducted.

Total 80 Marks

I.A. Marks to be calculated out of 10.

**Student will be eligible to appear for University examination if he/ she gets minimum 35% marks**
### EXAMINATION PATTERN OF B.P.T.-II

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Name</th>
<th>Theory</th>
<th>Duration</th>
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<td>Pathology &amp; Microbiology</td>
<td>50</td>
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**Passing Criteria – 50 % of total marks each in theory & practical**

**Eligibility to appear for University exam – 35 % in Internal Assessment**
III B.P.T.

[This syllabus is applicable from 2015-2016, i.e.-from the batch who gets admitted to the I B.P.T. course in 2013-2014]

Subjects-

Transcript Hours

1] Surgery - 130 hrs
   General Surgery-----------------------------------------------50 hrs
   Orthopedics-----------------------------------------------80 hrs

2] Medicine- 90 hrs
   Cardio-vascular & pulmonary Medicine----------------------30 hrs
   Neurology----------------------------------------------------31 hrs
   General Medicine, Rheumatology & Gerontology 14 hrs

Clinical 15 hrs

3] Paediatrics- 30 hrs

4] Dermatology 10 hrs

*5] Physical Diagnosis & Therapeutic skills-[D-6 : Cl-12 = 18 hrs/week]---400 hrs
6] Psychiatry ------------------------------------------ 60 hrs
7] Seminar---------------------------------------------2 hrs alternate weeks------------------60 hrs
   [including 1] Case presentation, 2] Literature review]
8] Community Health/Sociology & Biostatistics---------70 hrs
9] Obstetrics and Gynecology -----------------------------------30 hrs
10] Supervised Physiotherapy Practice-------3 hrs/ day, 5 days/week------520 hrs

Total Hours  ------------------------------------------ 1400 hr

* -To evaluate/assess & to practice Physio Therapy skills at the Acute care/Indoor as well as O.P.D set ups, under the supervision of Senior Physio therapist. A register/Log book to be maintained to document the Evaluation/Functional analysis & Functional diagnosis reports of minimum 3 cases per assignment & signature to be obtained from respective section In-charge at the end of each assignment
Surgery

General Surgery

Didactic - 40 hrs
Clinical - 10 hrs
Total - 50 hrs

Objective

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

1] Describe the effects of surgical trauma & Anaesthesia

2] Classify, clinically evaluate & describe the surgical management in brief in
   a] Wounds & Ulcers
   b] Burns
   c] Head injuries

3] Describe pre-operative evaluation, surgical indications & various surgical approaches & post operative management in various abdominal/ thoracic/peripheral vascular conditions/ENT conditions / Opthal conditions/ Plastic Surgery conditions

4] Recall the surgical approaches in the form of line diagram & will be able to describe the components of soft tissues cut to reach the target tissue & the possible Post operative complications

5] Be able to read & interpret findings of the X ray-chest.

Syllabus-
1) General 11 hrs
   
   1] Effect of Anesthesia & surgical trauma:
Hemorrhage (Clinical Manifestations and types)

Shock (Neurogenic, septic etc.)

Water & Electrolyte imbalance: Basic physiology, clinical manifestations

- **Level 2**: Specific values

2] Inflammation-acute & chronic-signs, symptoms, complications & management

3] Wounds/ ulcers-classification, healing process, management


- **Level 2**: Surgical Procedure

5] Modified Radical mastectomy-complications & management

6] Amputation-types, sites, complications & management

7] Burns-causes, classification complications & management

2) Neuro Surgery

1] Head Injury – types, clinical features, management

2] Intra cranial & spinal tumors - Types, Locations, Clinical Picture

- **Level 2**: Surgical Management

3] Surgeries of Head & neck in neurosurgical conditions & post operative care

- **Level 2**


3) Cardio vascular-thoracic surgery

1] Surgical approach

2] Post operative complications & management- in Thoracotomy, Thoracoplasty, Lobectomy, Pneumonecotmy, Decortication, CABG, Valvular Surgery, Congenital Heart Disease Surgeries and Surgery for Peripheral Vascular Disease

4] E.N. T. Surgery
1] Upper respiratory tract surgery & post operative care- Level 2

2] Tracheostomy – indications, surgical approach & management

3] Surgery for cancer – indications & post operative care- Level 2

4] Surgical procedures in VII th cranial nerve palsy

5] Ophthalmic Surgery
1 hr

1] Surgeries for III, IV & VI cranial nerve palsy- Level 2

6] Plastic Surgery
10 hrs

1] Skin grafts & flaps-Type, indications with special emphasis to burns, wounds, ulcers:

2] Tendon transfers, with special emphasis to hand, foot & facial paralysis

3] Keloid & Hypertrophied scar management

4] Reconstructive surgery of peripheral nerves

5] Surgeries for PVD (arterial & lymphatic dysfunction) -Level 3

**CLINICAL**- 10 hrs

A] Evaluation & presentation of one case each in burns, wound & ulcer, Head Injury, peripheral vascular condition, post Radical mastectomy, post thoracic surgery, post abdominal surgery


OBSERVATION- one abdominal & one thoracic surgery & one surgery of skin graft/flap

**TEXT BOOKS**

Standard surgical techniques- Shriram Bhatt

Manipal Manual Surgery- K. Rajgopal Shenoy

Short Practice of surgery – Bailey & Love
ORTHOPAEDICS

<table>
<thead>
<tr>
<th>Didactic</th>
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<tr>
<td>Clinical</td>
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<td><strong>Total</strong></td>
<td><strong>80 hrs</strong></td>
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</table>

**Objectives** - At the end of the course, the candidate will –

1] Be able to discuss the Pathophysiology, clinical manifestations & conservative/Surgical management of various traumatic & cold cases of the Musculoskeletal Conditions

2] Gain the skill of clinical examination & interpretation of the preoperative cold cases & all the post-operative cases

3] Will be able to read & interpret

   a] salient features of the X-ray of the spine & Extremities

   b] pathological/ biochemical studies pertaining to Orthopedic condition

4] Will be able to correlate the radiological findings with the clinical findings

**Syllabus**-

1] **Post trauma Pathology, clinical manifestations, healing process in bone & intra articular & extra articular soft tissues & introduction to implants & prosthesis** 3hrs

   - **Level 1**: stages of healing process, assessment, conservative & surgical management, complications & their management

   - **Level 2**: recent advances in surgical management,

2] **Fractures & dislocations of upper extremity & lower extremity & spine** 16hrs
i) Classification

ii) Pathology

iii) Conservative treatment

iv) Surgical intervention -
   
a) Surgical approach
   
b) soft tissue section / repair
   
c) internal / external fixation / arthroplasty
   
d) post operative complications
   
e) post operative management & management of complications

   - **Level 2**: diagnostic methods
   - **Level 3**: surgical advances

3] Fractures & dislocations of spine, fractures of thoracic cage, shoulder girdle & pelvis  

i) Classification

ii) pathology

iii) Conservative treatment

iv) Surgical intervention -
   
a) Surgical approach
   
b) Soft tissue section / repair
   
c) Internal / external fixation / arthroplasty
   
d) Post operative complications
   
e) Post operative management & management of complications

   - **Level 2**: diagnostic methods
   - **Level 3**: surgical advances

4] Management of Metabolic disorders  

a) Osteoporosis
b) Osteomalacia, rickets

Classification, type, assessment, management, complications
- **Level 2**: diagnostic methods (MRI, CT Scan, USG)

**5] Brachial Plexus / Lumbo Sacral Plexus & Peripheral nerve injuries**  
3hrs  
Nerve course, mechanism of injury, types of nerve injury, diagnostic methods & assessment, conservative & surgical management

- **Level 2**: diagnostic methods (MRI, CT Scan, USG)

**6] Deformities**  
3hrs  

a) spine – scoliosis / kyphosis

b) Deformities of extremities like Varus / Valgus, Torsion, Deformities of hands & feet

aetiopathology, assessment, investigations, conservative & surgical management

**7] Common Congenital Malformation** like CTEV, Developmental dysplasia of hip, torticollis etc.  
2hrs  
pathologenesis, clinical manifestation, assessment, investigations, conservative & surgical management

**9] Vascular Disorders** like Avascular Necrosis, Perthe’s Disease, and Compartmental Syndrome  
2hrs  
aetiopathologenesis, clinical manifestation, assessment, investigations, conservative & surgical management

**10] Soft tissue lesions**  
2hrs  
Pathology, clinical manifestation, investigation, conservative & surgical management, complications & their management

a) Sport injuries

b) Overuse injuries

**11] Arthritis of spine & extremity**  
3hrs  

a) degenerative-OA

b) infectious-septic, TB

C) inflammatory-RA, Ankylosing spondylitis
Pathology, clinical manifestation, risk factor, investigation, conservative & surgical management, complications & their management

- **Level 2**: other types of arthritis like gout, haemophilic, neuropathic etc.

12) **Reconstructive surgery** 6hrs

a) Reconstructive surgery for bone lengthening

b) Reconstructive surgery in Polio & Cerebral Palsy

c) Soft tissue lesions of Shoulder, Knee & Ankle

13) **Osteomyelitis** 2hrs

Pathology, clinical manifestation, investigation, conservative & surgical management, complications & their management

14) **Tumors of bone & management** 1hr

Classification Pathology, clinical manifestation, risk factor, investigation, conservative & surgical management, complications & their management

15) **Traumatic Amputation & management** 1hr

Level of amputation, assessment, management

16) **Hand injury & management** 2 hrs

Common fractures & dislocations of hand, soft tissue involvement related to tendon injury, crush injury of hand

Classification Pathology, clinical manifestation, risk factor, investigation, conservative & surgical management, complications & their management

17) **X-rays of extremities & spine** 1hr

- **Level 2**: CT/MRI/USG findings

18) **Relevant biochemical investigations - Level 2** 1hr

**Bed side clinic based on** (25 hrs)

a] acute soft tissue lesion [including nerve injury]

b] Degenerative arthritis of extremity joint

c] Degenerative arthritis of spine

d] Acute P.I.D
e] Chronic backaches
f] Post operative case of fractures of extremities
g] Traumatic paraplegia /quadriplegia

**OBSERVATION-**
At least 2 surgeries of # internal fixation, one knee/hip replacement & Reconstructive surgery of the tendons

**TEXTBOOKS**
1. Outline of Fractures 8th edition - Adams
2. Outline of Orthopaedics 8th edition - Adams
3. System of Ortho - Apley
4. Essentials of Orthopaedics for Physiotherapists- John Ebnezar
5. Essential Orthopaedics – Maheshwari

**SCHEME OF EXAMINATION IN THE SUBJECT-“SURGERY”**

**THEORY- 80 MARKS**

I.A 20 MARKS

**TOTAL 100 MARKS**

Student should get minimum 50% marks for passing the examination

#-Section B shall be set & assessed by a General Surgeon only

* Section C shall be set & assessed by an Orthopaedic surgeon only

**Section-A**

**Q-1-M.C.Q.-[10 x 1] based on single best answer in Surgery** 10 Marks

(10 minutes)

**Q-2-MCQs –[10x 1] based on single best answer in Orthopaedics** 10 Marks

(10 minutes)

# Section-B
Q-3-S.A.Q.-To attempt any five out of Six — [5 x 3 ]

[Based on General Surgery, Neurosurgery, and Ophthalmology]

Q-4-S.A.Q.-To attend any Three out of four [3x 5]

[Based on Cardiovascular-thoracic surgery, ENT and Plastic Surgery]

* Section-C

Q-5-S.A.Q.-To attempt any FIVE out of Six—[5 x 3]

[Based on Any topic in Orthopaedics]

Q-6-S.A.Q.-To attempt any Three out of Four [3 x5]

[Based on Any topic in Orthopaedics]

**INTERNAL ASSESSMENT**

Theory

1. General surgery – 1 terminal and one preliminary examination 40 marks each
(Section A- 10 marks, B -15 marks, C- 15 marks) as per university pattern

2. Orthopedics – 1 terminal and one preliminary examination 40 marks each
(Section A- 10 marks, B -15 marks, C- 15 marks) as per university pattern

Internal assessment should be calculated out of 20 marks

Student will be eligible to appear for University examination if he/ she get minimum 35% marks.
MEDICINE
[90 hrs]

GENERAL MEDICINE, RHEUMATOLOGY & GERENTOLOGY

Didactic 14 hrs

CARDIO-VASCULAR & PULMONARY MEDICINE

Didactic 30 hrs

NEUROLOGY

Didactic 31 hrs

Clinical 15 hrs

Objectives

At the end of the course, the candidate will

1] Be able to describe Etiology, Pathophysiology, Signs & Symptoms & Management of the various Endocrinal, Metabolic, Geriatric & Nutrition Deficiency conditions

2] be able to describe Etiology, Pathophysiology, Signs & Symptoms, Clinical Evaluation & Management of the various Rheumatological Cardiovascular, Respiratory & Neurological Conditions

3] Acquire skill of clinical examination of Musculoskeletal, Pulmonary, Cardiovascular & Neurological System;

4] be able to interpret auscultation findings with special emphasis to pulmonary system, Chest X-ray, Blood gas analysis, P.F.T. findings, Blood studies done for Neurological & Rheumatological conditions

5] be able to describe the principles of Management at the Medical Intensive Care Unit.
Syllabus-

7) General Medicine 14hrs

1) Disorders of Endocrine system (4hrs)
   i) Diabetes (1 hr)
   ii) Thyroid (2 hrs)
   iii) Calcium Metabolism (1 hr)
       - Level 2: Pituitary & Adrenal conditions

2) Degenerative / Rheumatological Conditions (5 hrs)
   i) Rheumatoid Arthritis (2 hrs)
   ii) SLE
   iii) SS A
   iv) Gout
   v) Polymyositis

3) Geriatric Conditions (3 hrs)
   i) Aging Process (1 hr)
   ii) Osteoporosis (1 hr)
   iii) General Health Care, Wellness clinic (1 hr)
       - Level 2: Alzheimer’s disease

4) Nutrition Deficiency Diseases (1 hr)

5) Drug Abuse / Intoxication / HIV - Level 2 (1 hr)

8) CARDIO-VASCULAR & RESPIRATORY MEDICINE 30 hrs

1) Cardio-vascular diseases- (13 hrs)
   a) Hypertension-systemic (1hr)
   b) I.H.D - Angina & Myocardial infarction (2 hrs)
   c) Arrhythmia – classification (1 hr)
   d) Valvular Heart Disease – i) Congenital ii) Acquired (2 hrs)
   e) Rheumatic Fever (1hr)
   f) Congestive Heart Disease (1hr)
   g) Infective Endo Carditis (1 hr)
   h) Geriatric Cardio Vascular problems & management (1hr)
   i) ECG – Normal & Variations due to ischemia & infarction (1 hr)
   j) PVD, DVT & Pulmonary embolism (2 hrs)
2] **Diseases of the respiratory system** (17 hrs)

a) Common Infectious diseases like Tuberculosis, Pneumonia, Bronchiectasis, Lung Abscess

b) Diseases of Pleura like Pleural Effusion, Pneumothorax, Hydropneumothorax, Empyema

c) Intensive Medical Unit – Infrastructure & Treatment (2 hrs)

d) Introduction of clinical examination –Breath sounds / X ray chest /

e) Blood gas analysis /P.F.T. (3 hrs)

f) Obstructive Lung Diseases like Bronchitis, Emphysema, Bronchial Asthma, Cystic Fibrosis (3 hrs)

g) Interstitial Lung Diseases (1 hr)

- Geriatric respiratory problems & management - **Level 2** (1 hr)

h) Occupational lung diseases like Silicosis Asbestosis, Pneumoconiosis, Brucellosis, Farmer’s Lung (1hr)

9] **NEURO MEDICINE** 31 hrs

1] **Circulation of the brain & spinal cord** (1 hr)

2] **Cerebro-vascular accidents** – Thrombosis, Embolism, Haemorrhage (3 hrs)

3] **Extra Pyramidal lesions** – Basal Ganglia (2 hrs)

   i) Parkinsonism (1 hr)

   ii) Athetosis, Chorea, Dystonia & Spasmodic Torticollis (1 hr)

4] **Space occupying lesions (Intracranial & spinal) – Level 2** (1 hr)

5] **Polyneuropathy** (2hrs)

   i) G B Syndrome (1hr)

   ii) Diabetic, Alcoholic & SACD (1 hr)

6] **Disorders of nerve roots and peripheral nerves** (1 hr)

7] **Disorders & Diseases of muscle** (3 hrs)

   i) Muscular Dystrophy – Types

   ii) Inflammatory Disorders –Polymyositis & Dermatomyositis
iii) Myopathy – Types

iv) Myotonia - **Level 2**

**8] Disorders of Anterior Horn Cell (3 hrs)**

i) Motor Neurone Disease (1 hr)

ii) SMA, Syringomyelia, Peroneal Muscular Atrophy, Polio (2 hrs)

**9] Multiple Sclerosis (1 hr)**

**10] Infections of the nervous system** - Encephalitis, Meningitis, Transverse Myelitis, Tabes Dorsalis & T.B. Spine (2 hrs)

   - **Level 2**: Neurosyphilis, HIV infection, Herpes

**11] Epilepsy (1 hr)**

**12] Tetanus - Level 2 (1 hr)**

**13] Disorders of Cerebellar function (2 hrs)**

**14] Disorders of Cranial Nerves & Special Senses (2hrs)**

**15] Disorders of Myoneural Junction – Myasthenia Gravis & Myasthenic Syndrome (1 hr)**

**16] Dysfunction of Autonomous Nervous System in Spinal Cord Lesions (1 hr)**

**17] Neurogenic Bladder (1 hr)**

**18] Cerebro Spinal Fluid (1 hr)**

   I)  Formation & Absorption

   II) Status in Various Disorders

**19] Sexually transmitted diseases & HIV - Level 2 (2 hrs)**

**CLINICAL-** (15 hrs)

Evaluation & presentation of Two cases Each in

i) U.M.N.lesion

ii) L.M.N.lesion

iii) Respiratory Condition

iv) Cardio Vascular Condition
v) Degenerative / Rheumatological Condition

vi) General Medical Conditions like Obesity, Nutritional disorders, Diabetes Mellitus & Metabolic bone disorders

TEXT BOOKS
1. API Textbook of medicine
2. Medicine for students 5th edition-Golwala
3. Principles & Practice of medicine 16th ed.- Davidson

REFERENCE BOOK
1. Textbook of Medicine-Harrison

SCHEME OF EXAMINATION IN “MEDICINE’

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<tr>
<td>INTERNAL ASSESSMENT</td>
<td>20 MARKS</td>
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<td>TOTAL</td>
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Student should get minimum 50% marks for passing the examination

Section A

MCQ.- Q-1] [20 x 1] single best answer

[Based on all the topics included in Medicine syllabus] 20 mark

Section B

SAQ.- Q-2]-to attempt any FIVE out of Six answers--[5 x 3 ]

[Based on Cardiovascular & Respiratory conditions] 15 marks

Q-3] -to attempt any THREE out of Four answers [3 x 5]

[based on Neurology ] 15 marks

# Section C

LAQ.Q-4]-[compulsory]-based on Neurology 15 marks

Q-5] [based on Cardio-vascular conditions] 15 marks

OR
Q-6] [based on Respiratory conditions]  

# L.A.Q. should specify the breakup of marks-e.g.-[3 + 5 + 7 ]

**INTERNAL ASSESSMENT**

One test each in

*1] General Medicine, Rheumatology & Gerontology Theory  
Clinical  
Total  
25 marks  
50 marks

2] Cardio-vascular & Respiratory Medicine  
Theory  
Clinical  
Total  
50 marks  
25 marks  
75 marks

3] Neurology  
Theory  
Clinical  
Total  
50 marks  
25 marks  
75 marks

*4] Pediatrics (Only Internal Assessment)   
(Syllabus Below)  
50 marks

*5] Dermatology (Only Internal Assessment)  
(Syllabus Below)  
50 marks

**TOTAL**  
300 marks

Internal Assessment marks to be calculated out of 20

*These subjects need individual passing in the exam to pass in the I.A. of the subject Medicine

**Student will be eligible to appear for University examination if he/ she gets minimum 35% marks**
PAEDIATRICS [30 hrs]

Didactic 20 hrs
Clinical 10 hrs

Objective- At the end of the course, the candidate will
1] Acquire knowledge in brief about intra-uterine development of the foetus
2] Be able to describe normal development & growth of a child, importance of Immunization & breast-feeding
3] be able to describe neuromuscular, musculoskeletal, cardio-vascular & pulmonary conditions related to immunological conditions, nutritional deficiencies, infectious diseases, & genetically transmitted conditions.
4] Acquire skill of clinical examination of a neonate /child with respect to neurological, musculoskeletal & respiratory function

Syllabus-
1] Normal intra-uterine development of foetus (1 hr)
2] Normal development & growth (2 hrs)
3] Immunization, Handling of the child, Significance of breast-feeding (1 hr)
4] Common causes for Developmental disorders like Sepsis, Prematurity, Asphyxia & Hyperbilirubinemia (1 hr)
5] Brain damage-Cerebral Palsy-types & Medical Management (2 hrs)
7] Common infections of C.N.S. & peripheral nervous system (2 hrs)
8] Epilepsy (1 hr)
9] Mental Retardation (1 hr)

10] Genetically transmitted neuro-muscular conditions (1 hr)

11] Malnutrition related conditions (1 hr)

12] Juvenile R A & other Immunological conditions of Musculoskeletal system (1 hr)

13] Common diseases of the respiratory system- like Asthma, Bronchitis, T.B., Pneumonia & bronchiectasis (2 hrs)

14] Rheumatic & Congenital heart disease (2 hrs)

CLINICAL- (10 hrs)

1] Normal & abnormal reflexes in neonate & child
2] Examination of the nervous system
3] Examination of respiratory system
4] Examination of cardiovascular system

TEXT BOOKS

Essentials of Paeds.- O.P Ghai

D.K. Series in Paeds.

* Internal assessment to be conducted at the end of the completion of the term—

Total-50 marks [Theory 25 marks + Viva 25 marks]

Passing in this IA is mandatory to pass in the I.A. of the subject Medicine
DERMATOLOGY

[10 HRS]

Objectives- At the end of the course, the student will-

1] Be able to describe the Pathophysiology, Signs & Symptoms, Clinical Features, Examination & Management of Common Skin Conditions like Leprosy, Psoriasis, Vitiligo, Acne, Alopecia, Bacterial & Fungal Infections of the skin, Auto-Immune Disorders, H.I.V. & Sexually Transmitted Diseases.

Syllabus-

1] **Introduction to Dermatology, basic skin lesions & History taking**

2] **Skin infections (Part I)** – Scabies / Pediculosis / Bacterial infections

3] **Skin infections (Part II)** – viral / Fungal / Cutaneous T.B.

4] **Psoriasis / Sebaceous Dermatitis / Atopic Dermatitis / Hand eczemas**

   (Psoriasis & Eczema)

5] **Pigmentary Disorders** (Vitiligo, Melasma) & Drug Reactions (Urticaria, Fixed Drug Eruption, Maculo Papular Drug Rash, Erythema Multiform minor, Steven Johnson Syndrome, Toxic Epidermal Necrolysis)

6] **Leprosy & Deformity**

7] **Autoimmune Disorders** (Scleroderma, Systemic Lupus Erythematosus, Dermatomyositis)

8] **Acne & treatment of Acne** (Including cosmetic & Dermatosurgical procedures)

   (Chemical peels, MDA etc.)
9) **Disorders of Scalp** (Dandruff, Chronic Hair loss, Alopecia)

10) **Sexually Transmitted Diseases**

11) **HIV & Cutaneous manifestations**

12) **Topical therapy in Dermatology.**

**TEXT BOOKS**

An Illustrated Handbook of Skin Diseases and STDs - Khopkar

**INTERNAL ASSESSMENT**

One Theory examination of 50 marks to be conducted at the end of the term & Passing in the I.A. is mandatory
PHYSICAL DIAGNOSIS & THERAPEUTIC SKILLS [400 hrs]

HUMAN DEVELOPMENT, GROWTH & AGING PROCESS

Didactic 20 hrs
Laboratory 10 hrs

ELECTRODIAGNOSIS

Didactic 20 hrs
* Lab/Clinical 60 hrs

FUNCTIONAL ANALYSIS

Didactic 30 hrs
* Lab/Clinical 80 hrs

MANIPULATIVE SKILLS

Didactic 10hrs
Practical/Laboratory 120 hrs

NEURO THERAPEUTIC SKILLS

Didactic 10hrs
Practical/Laboratory 40 hrs

Objectives-
At the end of the course, the candidate will
1] Be able to describe the human development & maturation; with special emphasis to sensory, motor, psychological & social aspects & alteration during aging process
2] Acquire the skill of detection & objective documentation of the Neurological, Musculo-skeletal, cardiovascular, pulmonary and integumentary dysfunctions such as Pain, altered muscle power mobility, endurance, limb length, posture, gait, hand function & A.D.L. in adult & paediatric conditions & acquire skill & interpretation of Exercise tolerance test to arrive at the Functional diagnosis as per ICF

3] Acquire the skills to use on patients, the therapeutic currents, for Electro-diagnosis of sensory & motor dysfunction & pain.

4] Be able to describe the physiology of nerve conduction & motor units, interpretation of Normal EMG, Nerve Conduction studies & Late responses

5] Acquire the simple skills of mobilization of the extremities on models

6] Acquire the neuro therapeutics skills on models/patients

7] Be able to do Interpretation of common investigations used for functional diagnosis

**Syllabus**

**1] General principles & course of Human development & maturation**

**10) aspects-**
     - **Level 2:** v) emotional vi) Cultural vii) Social

**11) Factors influencing human development & growth-**
   - i) Biological ii) Environmental iii) Inherited

**12) Principles of maturation –**
   - i) In general
   - ii) In anatomical directional pattern- Cephalo-caudal, Proximo-distal, Centero-lateral, Mass to specific pattern, Gross to fine motor development
   - iii) Reflex maturation tests
   - iv) Development in specific fields, oromotor development, Sensory development, Neurodevelopment of hand function

**2] Electro diagnosis**

**13) Physiology of resting membrane potential & action potential, Propagation of Action Potential, Volume conduction**
14) Physiology of muscle contraction
15) Motor unit & Recruitment pattern of motor unit – Size principle
16) Therapeutic current-as a tool for electro diagnosis.

   i) Physiological principles

   ii) Faradic Galvanic Test, Strength Duration Curve

   - **Level 2:** Other objective methods of assessing Sensory Pain Threshold & Pain Tolerance

- Electro-myography

   i) Principles

   ii) Instrumentation – Basic components like CRO, Filter, Amplifier & Preamplifier,

   iii) Types of Electrodes
iii) Normal

   a. Insertional activity/at rest
   b. on minimal contraction
   c. on maximal contraction
   - **Level II**- Abnormal EMG pattern

- Nerve Conduction Studies

  i) Principles & Technique
  ii) F wave
  iii) H reflex
  - **Level III**- Blink reflex

**3] Basics in Manual Therapy**

A] Surface Anatomy

B] Examination of joint integrity

- Contractile tissues
- non contractile tissues

C] Mobility – osteokoinematics, arthrokinematics & end feel

D] Evaluation & treatment of soft tissue structures

a) Skin & superficial fascia b) body contour c) Myofascial structures
  - **Level 2** –Trigger point assessment & treatment

E] Pain – Original & Referred

F] Tissue Response to immobilization & remobilization

G] Clinical Reasoning Process in Manual Therapy
H] Basic principles, indications & contraindications of mobilization skills for extremity joints & soft tissues

i) Maitland

ii) Kaltenborn

iii) Mulligan

iv) McKenzie

e) MET  f) Myofascial release
g) Cyriax  h) Neuro-Dynamic Testing

4] Basics in Neuro Therapeutics Skills & Applications with Clinical reasoning

i) Principles of Neuro Developmental Technique, Rood’s Technique (only theory), PNF, Brunnstrom

ii) Technique (Demonstration on patients, practice on models)

iii) Indications for Application

5] Assessment of Movement Dysfunction

i) Higher functions: Arousal, Attention, Orientation and Memory:

Glasgow Coma Scale, Mini Mental Scale

- Level 3: Intelligence, Language

ii) Cranial nerves

iii) Sensations & sensory organization: Dermatomes, Peripheral nerves

- Level 2: Monofilaments

iv) Joint mobility

v) Body image

vi) Tone: Modified Ashworth scale
vii) Reflexes- Superficial & Deep

viii) Voluntary control: Brunnstorm stages, STREAM format

ix) Muscle Strength

x) Co -ordination

xi) Balance: Physiology, Strategies (sensory, Motor, Central Processing, task related, Environment related)

Scales: Single dimension- Single Leg Stance, Rhomberg's test, Functional reach test

Multidimensional- Dynamic Gait Index, Berg's Balance Scale, Modified clinical test for sensory interaction & balance (mCTSIB)

- **Level 2**: Balance Master

d) Endurance

tri) Trick movements

xiv) Limb Length

xv) Posture

xvi) Gait

xivii) Functional Diagnosis using ICF

xviii) Interpretation of Electro diagnostic findings, routine Biochemical Investigations

xix) Functional scales: Barthel's Index, Functional Independence Measure.

**6) Assessment of Cardio Vascular, Pulmonary & Integumentry Dysfunction**

i) Vital parameters – Assessment of blood pressure, respiratory rate, Heart rate, peripheral pulses, SpO2

- **Level 2**: Cardiac sounds

ii) Chest expansion

iii) Symmetry of chest movement

iv) Breath Sounds: normal and abnormal

v) Percussion – Tactile Vocal Fremitus/resonance

vi) Rate of Perceived Exertion (RPE)
vii) Quality of life – SF 36, other questionnaires specific to relevant Cardio Pulmonary conditions

viii) Maximal/submaximal testing - six minutes walk test, Incremental shuttle walk test, Treadmill test (stress testing)

(Bruce/Balke/Naughton), cycle ergometer (Astrand), Step test

- **Level 3**: Direct measurement of VO2 max, To consider the effect of pharmacological agents on Exercise Testing & Training

ix) Spirometry, Flow volume loop

x) ABG, X-ray Chest

xi) ECG- (Normal & Variations due to Ischaemia & Infarction)

xii) Routine biochemical investigations

xii) Tests for Peripheral Arterial & Venous circulation Ankle Brachial Index, name of tests peripheral pulses

- **Level 2**: Doppler

xiii) Assessment of Wound & Skin Lesions

xiv) Burns –Types & Assessment

xiii) Functional Diagnosis using ICF

7] **Assessment of Musculoskeletal Dysfunction**

i. Shortening of soft tissues-Tests for evaluating flexibility

ii. Joint Mobility- including spinal mobility, measurement of cervical spine mobility using measure tape, Schober’s test for lumbar spine mobility

- **Level 3**: CROM, BROM, Inclinometer

iii. Muscle strength

- **Level 3**: Basic softwares for postural assessment, Introduction to various skills

Available for postural assessment- RULA, REBA, NIOSH, OWAS, OCRA

iv. Limb Length

v. Trick Movement

vi. Posture

vii. Gait

viii. Special Tests

ix. Functional Diagnosis using ICF-2
x. X-ray of extremities & spine, routine bio-chemical investigations

8] **Assessment of Hand**

i) Sensations

ii) Mobility of Joints

iii) Strength

iv) Special Tests like Froment’s Sign, Bunnel – Littler’s Test, Phalen’s Test, Tinel’s Sign, Wartenberg’s Sign

   - **Level 2:** Modified Jebson Taylor hand function test

v) Hand Function – Precision & Power Grips

9] **Assessment of pain**

i) Intensity & quality

ii) Objective assessment & documentation – VAS, Mc Gill’s modified Questionnaire, Numerical Rating Scale

10] **Assessment of Obesity**

i) Pathophysiology

ii) Assessment – BMI, Waist – Hip Ratio, Skin fold Caliper, Girth measurements

   - **Level 3:** Hydrodensitometry, Plethysmography, DEXA

11] **Introduction to Quality Of Life Questionnaire- SF36**

**CLINICALS**-

1] Practice of Manual Therapy in Kaltenborn, Maitland, Mulligan & Cyriax on extremities only & only on models Neurodynamic testings- ULTT, Slump test, SLR & its variants & prone knee bend test

2] Electro-diagnostic assessment – S D Curve, Faradic Galvanic Test, to be carried out on relevant patients

3] Identification of normal & abnormal breath sounds, measurement of chest expansion, pattern of breathing, Vital parameters, Percussion techniques, Grades of Dyspnoea, Rate of Perceived exertion, Tests for Peripheral Vascular Disease to be carried out on relevant patients
4] Exercise tolerance testing – 6 minute walk test & Incremental Shuttle & Step Tests on models only

5] Practice of Neuro Therapeutic Skills of NDT, PNF & Brunnstrom on models/patients


**Term work** in Clinical--

a] Documentation & Interpretation of following investigations

i] Electro diagnosis – 1 each

a) SDC

b) Faradic Galvanic Test

ii] Cardio Vascular & Pulmonary – ABG, Spirometry & Flow Volume Loops, ECG, X-ray Chest, Exercise Tolerance Test – 1 each

iii] Neurological – Scales like Modified Ashworth, Berg’s Balance, DGI, Glasgow Coma, Barthel Index, STREAM Format – Any 3 & EMG & NC Studies – 2 each

b] Case presentation with Functional diagnosis - Three cases Each in-

i] Musculoskeletal

ii] Neurological

iii] Cardiovascular, Pulmonary & Integumentary

To maintain the Record/Journal of the term work & to get each assignment duly signed by Head

**TEXT BOOKS**

1. Maitland’s Peripheral Manipulation – Elly Hengeveld
2. Electrotherapy Explained -Low And Reed
3. Clinical E.M.G. - Mishra
5. Cash’s Textbook of Neurology for Physiotherapists – Patricia Downie
6. Ortho. Physical Examination - Magee
7. Physical Rehabilitation – O'Sullivan
8. Cash’s Textbook of Orthopaedics & Rheumatology for Physio Therapists - Patricia Downie
9. Cash’s Textbook for Physio Therapists in Neurological disorders – Patricia Downie
10. Cash’s Textbook for Physiotherapists in Chest, Heart & Vascular diseases - Patricia Downie
11. Cash’s text book in General Medical & Surgical conditions for Physiotherapists - Patricia Downie
12. Brain’s disorders of Nervous system – Michael Donaghy
14. Chest Physical therapy & pulmonary rehabilitation - by Donna Frownfelter
15. ECG – by P.J. Mehta
16. PNF in practice – Susan Adler
17. Mobilisation of Nervous system – David Butler

REFERENCE BOOKS
1. Electrodiagnosis in diseases of Nerve and Muscle - Kimura
2. Ortho physiotherapy - Donatelli
3. Physiotherapy for Respiratory & Cardiac Problems- Webber & Pryor
4. Exercise Physiology - McArdle
5. Muscle Energy Techniques – Chaitow Leon
6. The Myofascial Release – Carol Manheim
7. Mobilisation of the Nervous System – David Butler
8. Textbook of Ortho. Medicine Part I & II – Cyriax
9. Motor Control – by Shumway Cook
10. Exercise Physiology – by McArdle
11. Cardio Pulmonary Physical Therapy – Scot Irwin

SCHEME OF EXAMINATION-

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<tr>
<th>THEORY-80 MARKS</th>
<th>CLINICAL - 80 MARKS</th>
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<td>IA- 20 MARKS</td>
<td>I.A - 20 MARKS</td>
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<td>TOTAL 100 MARKS</td>
<td>TOTAL - 100 MARKS</td>
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Student should get minimum 50% marks for passing the examination

THEORY

Pattern of paper setting-
Section-A

M.C.Q Q-1- Based on single best answer [20 x 1] - (20 minutes) 20 marks

Section-B

S.A.Q Q-2]- To answer any Seven out of Eight—[7 x 2 ] 14 marks

Q-3]-To answer any Four out of Five—[4 x 4] 16 marks

#Section-C-

L.A.Q Q-4] based on ICF 10 marks

Q-5] Any two out of three 10x2=30 marks

#- Each LAQ should give break up of 10 marks-e.g.-[3 + 4 + 3 ] etc

CLINICAL

Pattern of Examination

A] Long Case -any medical or surgical condition 30 marks

[Time maximum 30 minutes for student for evaluation]

i] Psychomotor & affective--skill of History taking [5 marks]

ii] Skill of clinical examination [10 marks]

iii] Skill of objective Diagnostic procedure [5 marks]

iv] Cognitive –Ability to justify bases for functional diagnosis- [10 marks]

B] Short Case

I] Mobilisation Technique (On Models) + Any one musculoskeletal dysfunction assessment* [20 marks]

II] Neuro Therapeutic Skills – NDT / PNF / Brunnstrom (On Models)/ Any one movement dysfunction assessment* [10 marks]

OR

II] Electro Diagnosis – SD Curve / Faradic Galvanic Test (On Patient)
OR

II] Exercise Tolerance Test (On Model) / Cardiopulmonary assessment (on patient)  [10 marks]

* All assessments to be performed on patients only

C] Spots- (Five)
   a] X ray
   b] Pulmonary Function Test
   c] Blood gas analysis  [3 x 5=15 marks]
   d] E.C.G.
   e] E.M.G./ N.C. studies

4] Term work  5 marks

INTERNAL ASSESSMENT

THEORY

1 Terminal & 1 Preliminary Examination of 80 marks each (based on pattern of University examination)

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CLINICAL / PRACTICAL

1 Terminal & 1 Preliminary Examination of 80 marks each (based on pattern of University Examination)

Internal Assessments marks should be calculated out of 20 marks in Theory & 20 marks in Clinical/ Practical

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

Didactic  20 hrs
Clinical  10 hrs
Total    30 hrs

Objective

At the end of the course, the candidate will

1] Be able to describe the normal & abnormal physiological events during the Puberty, Pregnancy, Labor, Puerperium & Pre, Peri & Post Menopause

2] Be able to discuss common complications during Pregnancy, Labour, Puerperium & Pre, Peri & Post Menopausal stage & various aspects of Pelvic floor Dysfunction & the management in brief

Syllabus-

1] **Physiology of Puberty & Menstruation, Abnormalities & common problems of Menstruation**
   2 hrs

2] **Pregnancy**—Fertilization, Development of the foetus, Normal gestations, Abnormal/Multiple gestations, Common Complications during pregnancy like P I H, Eclampsia, Diabetes, Hepatitis, German Measels, TORCH infection.
   3 hrs

3] **Labor**
   4 hrs
   
   i) Normal-Events of I\textsuperscript{st}, II\textsuperscript{nd} & III\textsuperscript{rd} Stages of labor
   
   ii) Common Complications during labor & management
   
   iii) Caesarian section

4] **Post Natal**—Puerperium, lactation, Overview of Contraception, Overview of complications of repeated child bearing with small gaps
   2 hrs

5] **Overview of Sterility-management- Level 2**
   1 hr

6] **Overview of family planning**
   1 hr

7] **Uro-genital dysfunction**
   3 hrs
   
   i) Uterine prolapse-classification &management (Conservative /Surgical)
   
   ii) Cystocoele, Rectocoele, Enterocoele
8] Neoplasm of Female reproductive organs-surgical management
- Level 3

9] Pre, Peri & Post Menopause-Physiology, Complications & management

10] Pelvic Inflammatory Diseases with special emphasis to backache due to Gynaec / Obs conditions

CLINICAL - (10 hrs)
Evaluation & presentation of two cases each in
   a) Pelvic floor dysfunction
   b) Antenatal care
   c) Postnatal care
      i) Following normal labor
      ii) Following Caeserean section
   d) Pelvic Inflammatory Diseases

OBSERVATION- One Normal & One Caesarian delivery, one case of Tubectomy & One Hysterectomy /Repair of the Uro-genital Prolapse

TEXT BOOKS
Text Book of Gynaec- Dutta
Text Book of Obs- Dutta

SCHEME OF EXAMINATION

THEORY 40 marks

IA 10 marks

TOTAL 50 mark

Student should get minimum 50% marks for passing the examination

Section-A

MCQ-g-1-[MCQs based on Single best answer]
10marks

(10 minutes)

Section-B
SAQ-G-2 – Answer any FIVE out of Six—[5 x 3]
15 marks

Section-C-

SAQ-G-3 – Answer any THREE out of Four—[3 x 5]
15 marks

INTERNAL ASSESSMENT-

One theory paper 40 marks
Clinical 40 marks
Total 80 marks

Marks to be calculated out of 10

Student will be eligible to appear for University examination if he/she get minimum 35% marks.
COMMUNITY HEALTH /SOCIOLOGY & BIO-STATISTICS

Section-I

COMMUNITY HEALTH

Didactic 70 hrs

Objectives-

At the end of the course, the candidate shall be able to understand

1. General concepts of Health & Disease
2. Strategies of Health Delivery System
3. Socio-Economic and Cultural issues related to morbidity
4. Health problems of vulnerable group.
5. Objective methods of family planning
6. Various aspects of Mental Health.
8. Immunization programme

Syllabus

Community Health 30 hours

1) Concepts of Health & Disease 3 hrs

Concepts of health, World Health Organization definition of health,
Dimensions of health, Spectrum of health, determinants of health, ecology of
health, responsibility of health, indicators of health, levels of health care,
Physical Quality of Life Index

Concepts of disease causation, natural history of disease, risk factors, iceberg
phenomena Disease control, elimination, eradication, levels of prevention,
modes of intervention

- **Level 2**: Human development index, monitoring, surveillance,
sentinel surveillance, functions of physician, International
classification of diseases (ICD).

- **Level 3**: Positive health, health- A relative concept, Human
Poverty Index, Gender Development Index, Gender Empowerment
Measure.
2) **Principles of Epidemiology & Epidemiological Methods**  5 hrs
Definition, Aims of epidemiology, epidemiological approach, incidence, prevalence, descriptive epidemiology, case control study, cohort study, use of epidemiology, infectious disease epidemiology, disease prevention & control, investigation of an epidemic, screening

- **Level 2**: Basic measurements in epidemiology, measurement of mortality, Randomized Control Trials, Non- Randomized Control Trials, association & causation, Adverse Events Following Immunisation, health advise to travelers, disinfection

3) **Epidemiology of Communicable & Non Communicable Disease**  6 hrs
Tuberculosis, Polio, Leprosy, Acquired Immunodeficiency Syndrome, Cardiovascular Disease, Diabetes, stroke, accidents & injuries, Chronic Obstructive Pulmonary Disease

- **Level 3**: Acute Respiratory Infection, Acute Gastroenteritis, Malaria, Dengue, Hypertension, Rheumatic Heart Disease, cancer, obesity and blindness

4) **Health Programmes in India**  3 hrs
Revised National Tubercular Control Programme, national Acquired Immunodeficiency Syndrome control programme, Reproductive & Child Health, National vector borne disease control programme, community nutrition programmes, National leprosy elimination programme, National Rural Health Mission, Universal Immunisation Programme, Pulse Polio,

- **Level 2**: National programme for control of blindness, Integrated Management of Neonatal and Childhood Illness, National cancer control programme, National mental health programme, National programme for control of diabetes, stroke, Cardiovascular Disease, National programme for control & treatment of Occupational disease

5) **Demography & Family Planning**  1hr
Demographic cycle, contraceptive methods, Medical Termination of Pregnancy act
- **Level 2**: Demographic trends, fertility statistics and National family welfare programme

**6) Health Problems & Vulnerable Group**
1 hr
Pregnant & lactating mothers, children, geriatric population including genetic abnormalities, problems related to nutrition, injuries aging etc. adolescent health

**7) Nutrition & Health**
5 hrs
Macronutrients, Macronutrients & deficiencies, nutritional problems of public health importance, assessment of nutritional status, socio-cultural factors of nutrition, food additives, fortification & adulteration

**8) Environment & Health**
2 hrs
Air & water pollution (in brief), hygiene & sanitation,

  - **Level 3**: Ventilation, noise, radiation, metrology, housing, waste disposal, medical entomology, Hospital waste management, disaster management

**9) Occupational Health**
2 hrs
Occupational hazards, pneumoconiosis, health problems due to industrialization, measures for health protection of workers, prevention of occupational disease including Employees State Insurance Scheme & factories act

  - **Level 2**: Lead poisoning, occupational cancers & dermatitis, sickness absenteeism, accidents in industries, occupational hazards of agriculture workers

**10) Health Systems of India**
2 hrs
levels of health care, definition of primary health care, elements of health care, principles of health care, health care delivery system, World Health Organization, United Nations Children’s Fund.
- **Level 3**: millennium development goals, Indian public health standards for Primary Health Centre, Community Health Centre, sub centers, job descriptions of members of health teams, other Non Governmental Organization's

**Text Books**

1] Park’s Textbook of Preventive & Social Medicine - K. Park

**Section-II**

**BIOSTATISTICS**

[25 hours]

**Objectives**-

At the end of the course, the candidate shall

1] Gain knowledge of the basic concepts of Biostatistics & its need for professional practice & Research

2] Be able to describe an Over-view-
   
   a] Ethnography & Anthropology

   b] Design & Methodology of an Experiment or Survey

   c] Demography & vital statistics

   d] Sampling & interpretation of Data

**Syllabus**-

1] **Introduction**-Uses of Statistical Methods in Physiotherapy –Measurement Scales, Variables & their Measurements, Types Of Data, Symbolic Data, Operations

2] **Statistical data**-Tabulation, Calculation of Central Tendency & Dispersion, Linear Regression & Correlation –Presentation of Data in Diagrammatic & Graphic Form

3] **Probability & Sampling** as a Mathematical System, Population & Samples, Sampling Distribution, Sampling Methods, Normal Distribution

4] **Probability & analysis of qualitative & quantitative research**, matching the research design to the statistical test- **Level 2**
5] **Testing of hypothesis:** Parametric tests, non parametric tests (distribution free tests), design & analysis of experiments- **Level 3**

**Text Books –**

1] Methods in Biostatistics - B.K. Mahajan

**SECTION-III**

**SOCIOLOGY**

[15 hrs]

**Objectives:**
At the end of the course, the candidate shall be able to understand

1. Influence of sociology on Health
2. Concept of Socialization, Social Groups, Family Influence, Community Influence, Cultural Influence and Caste system.
4. To understand the role of social worker

**Syllabus-**

1) **Family**, types & functions of family, family & health, cultural factors in health & disease, social problems, role of Medico social Worker, social security & social legislation in relation to disabled, Consumer Protection Act
   - **Level 2**: socialization, social groups, social change factors & control, Socio Economic classification
   - **Level 3**: caste systems

2) **Mental Health** Including Addictions

**TEXT BOOKS**

1] An introduction to sociology- Allahabad; kitab mahal ltd,1974 - Sachdeva & Bhushan

SCHEME OF EXAMINATION

THEORY  80 marks
IA  20 marks
TOTAL  100 marks

Student should get minimum 50% marks for passing the examination

Section-A

MCQ-

Community Health - 10 marks – M.C. Q - Single best answer
20 marks

Biostatistics – 5 marks – M.C.Q. - Single best answer

Sociology – 5 marks – M.C.Q. - Single best answer

(20 minutes)

Section-B

Based on Community Health

SAQ- Q-2 –Answer any 5 out of 6—[5 x3] 15 marks

SAQ- Q-3 -Answer any 3 out of 4—[3 x 5] 15 marks

Section-C-

SAQ- Q-4-Answer any 3 out of 4 (based on Biostatistics) — [3 x 5] 15 marks

SAQ- Q-3-Answer any 3 out of 4 (based on Sociology) — [3 x 5] 15 marks

INTERNAL ASSESSMENT-
1 Terminal & 1 Preliminary Examination of 80 marks each as per pattern of University examination.

Internal assessment marks should be calculated out of 20 marks
PSYCHIATRY

Didactic                30 hrs
* Clinical              30 hrs
Total                   60 hrs

Objective- At the end of the course, the candidate will be able to-

1] Identify various Psychiatric disorders with special emphasis to movement
   /Pain & ADL- describe the various causative factors & methods of
   assessment & management

2] Acquire the knowledge in brief about the pathological & etiological factors,
   signs & symptoms & management of various Psychiatric conditions

3] Describe in brief the various treatment modalities commonly used

Syllabus

*1] Psychiatric History & examination of mental status

2] Classification of mental disorders

3] Psychotic disorders - Schizophrenia & its types in brief, delusional
disorder, schizo-affective disorders, post-partum psychosis, mood
disorders, Organic mental disorders, Anxiety disorders, Phobia, Obsessive
compulsive disorders, Dissociation Conversion disorder, Hypochondriasis,
Post-traumatic disorder, Personality disorder, Substance related disorder,
Adjustment & Impulse control disorder, Psycho-sexual disorders, Psycho-
Somatic disorder Psychiatric emergencies-suicide, Stress management
Disorders of infancy, childhood & adolescence - disruptive behavior,
conduct disorder, attention deficit, hyper-reactivity, eating disorder, tic
disorder, elimination disorder, child abuse, enuresis

4] Autism- Introduction, diagnostic criteria

5] Management-ECT, chemotherapy, group therapy, psychotherapy, cognitive
   behavioral therapy, behavioral therapy

TEXT BOOKS

   publishers
2] Handbook of Psychiatry by Shah L.P

SCHEME OF EXAMINATION-*[COLLEGE EXAMINATION]

1 test in Theory                           40 marks
1 Clinical test                           40 marks
                                               Total  80 marks
EXAMINATION PATTERN   OF B.P.T.-III

**-COLLEGE EXAMINATION** passing in college examination is mandatory to appear for university examination. The marks obtained in the respective college examination shall be converted into grades.

**GRADE** - A+: 75% & above, A: 66 to < 75%, B+: 55 to < 66%, B: 50 to < 55%, C: < 50% [FFF]

**Passing Criteria** – 50% of total marks each in theory & practical

**Eligibility to appear for University exam** – 35% in Internal Assessment

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<th>Sr. No</th>
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<th>Theory</th>
<th>Duration</th>
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<td>Obstetrics and Gynaecology</td>
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<td>Physical Diagnosis &amp; Therapeutic Skills</td>
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<td>Community Health /Biostatistics /Sociology</td>
<td>80</td>
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*NOTE: Passing in college examination is mandatory to appear for university examination.*
[This syllabus is applicable from 2016-2017, i.e.-from the batch who gets admitted to the I B.P.T. course in 2013-2014]

**Subjects-**

1] Musculoskeletal Physiotherapy ..........................135 hrs
2] Neuro- Physiotherapy........................................135 hrs
3] Cardiopulmonary and Integumentary Physiotherapy ..........135 hrs
4] Physiotherapy in Community Health .........................135 hrs
5] Principles of Bio-engineering..................................20 hrs
6] Professional issues / Administration/Management/Marketing----35 hrs
7] Research Methodology & Biostatistics----------------------25 hrs
8] Seminar---------------------------------------------------------------------------------------------34 hrs

[Including Case presentation-17 hrs + Literature review-17 hrs]

9] Supervised clinical practice + Project------------------------746 hrs

Clinical assignments shall be of 100 hours at Indoor & 100 hours at the Outdoor section respectively in Each of the subjects mentioned in 1,2,& 3 above. Clinical assignment in subject 4] mentioned above shall be of 146 hours including 66 hrs in clinical assignments & 80 hrs for project

A] During each clinical assignment, the student shall functionally diagnose, plan & practice Clinical skills on patients in consultation with the experienced senior staff.

B] During each clinical assignment He /she shall maintain a separate File /journal for each subject & keep all the records of the Clinical assignment & Ward exam./Seminar etc in the respective file. However the records of the Project work in the subject of PT in Community Health shall be maintained in the file titled as “PROJECT FILE” The candidate shall get the clinical & project work duly verified with the signature from the Head at the end of each respective assignment
**MUSCULOSKELETAL PHYSIOTHERAPY**

**Didactic**

40 hrs

* **Clinical**

95 hrs

**Total**

[135 HRS]

**Objectives**

This course is formulated on the “Problem based learning” method.

At the end of the course, the candidate will-

1] Be able to identify, discuss & analyse, the Musculoskeletal Dysfunction in terms of Biomechanical, Kinesiological & Biophysical bases & correlate the same with the provisional diagnosis, routine radiological & electrophysiological investigations & arrive at appropriate Functional Diagnosis with Clinical Reasoning.

2] Be able to plan & prescribe as well as acquire the skill of executing short & long term Physio Therapy treatment by selecting appropriate modes of Mobilisation / Manipulations, Electro Therapy, Therapeutic exercises & appropriate Ergonomic Advise for the relief of pain, restoration/maintenance of function & rehabilitation for maximum functional independence in A.D.L at home & work place.

**Syllabus**

Following topics are applicable to All the Musculoskeletal conditions (Adult & Paediatric) included in the various clinical subjects of Medical Sciences taught in III B.P.T. course.

1] **Evaluation, interpretation of investigations & functional diagnosis with appropriate clinical reasoning for planning & implementation of management techniques.**

2] **Planning, Prescription & Implementation of short term & long term goals with clinical reasoning.**

3] **Documentation**

4] **Application of appropriate electro therapeutic modes** for relief of acute & chronic pain & swelling; wound healing, re-education etc with clinical reasoning

5] **Application of Simple therapeutic modes** for muscle strength & joint mobility

7] **Application of various taping methods** for support & relief of pain

8] **Posture Correction & Gait Training**

9] **Prescription of appropriate orthotic & prosthetic devices & fabrication of simple temporary splints**

10] **Application of appropriate Therapeutic exercises** using therapeutic gymnastic tools as and when necessary, for the relief of pain, structural stability, strength & endurance & functional restoration including gait training and exercises for the preventive measures.

11] **Appropriate Home Programme & Ergonomic advise** for preventive measures & functional efficiency at home & work place, advice to Parents & Care Givers.

* All the advanced therapeutic modes of mobility should be applied only on extremities.

**A) FRACTURE AND DISLOCATION**

I) Upper extremity

II) Lower extremity

III) Spine – Cervical, Thoracic & Lumbar

Types, Pathomechanics, Mechanism of Injury, Investigations, Assessment, Functional diagnosis using ICF, conservative & surgical management, complications, physiotherapy management

   - **Level 2**: Recent advances in rehabilitation and assessment Protocols

**B) Soft tissue involvement – conservatively managed, surgically managed**

I) Upper extremity

II) Lower extremity

III) Spine- Cervical, Thoracic & Lumbar
Types, pathomechanics, assessment, functional diagnosis based on ICF, conservative & surgical management, complications, physiotherapy management

- **Level 2**: Recent advances in rehabilitation

**D) Management of tumors**

I) Upper extremity
II) Lower extremity
III) Spine- Cervical, Thoracic & Lumbar

Classification, etiopathogenesis, assessment, functional diagnosis based on ICF, conservative & surgical management, chemotherapy, radiotherapy, complications, physiotherapy management

- **Level 2**: Recent advances in wound management,

**Upper extremity (U.E)**

**A) Brachial plexus injuries and peripheral nerve injuries in U.E.**

Nerve course, mechanism of injury, electrodiagnostic methods, assessment, Functional diagnosis using ICF surgical & physiotherapy management

- **Level 2**: Interpretation of EMG/NCS, Advances in rehabilitation

**B) Traumatic amputation**

Level of amputation, assessment, functional diagnosis based on ICF, surgical & physiotherapy management, orthotic & prosthetic management –

- **Level 3**: Advances in orthotic & prosthetic management, biomechanical considerations in prescription of prosthetics

**C) Sports injuries**

Classification of sports injuries, risk factors for sport injuries, assessment, functional diagnosis based on ICF, preventive measures. Surgical & physiotherapy management,

- **Level 3**: Objective Outcome measures & recent advances in rehabilitation

**D) Overuse injuries**

Pathomechanics, types, assessment, functional diagnosis based on ICF, surgical & physiotherapy management

- **Level 3**: Recent advances in rehabilitation
E) Crush injuries
Causes, classification, complications, assessment, functional diagnosis based on ICF, surgical management and physiotherapy management
- Level 2 - recent advances in rehabilitation and assessment, protocols of crush injury management.

Lower extremity

A) Lumbar plexuses injuries & peripheral nerve injuries
Nerve course, mechanism of injury, electro diagnostic methods, assessment, functional diagnosis based on ICF, surgical & physiotherapy management
- Level 2 – Recent advances in physiotherapy management, functional outcome scales, interpretation of EMG/NCS.

B) Traumatic amputation-
Levels of amputation, assessment, functional diagnosis based on ICF, surgical & physiotherapy management, orthotic & prosthetic management
- Level 3 - Recent advances in orthotic & prosthetic management, biomechanical considerations in prescription of prosthetics

C) Sports injuries
Classification of sports injuries, risk factors for sport injuries, assessment, functional diagnosis based on ICF, preventive measures. Surgical & physiotherapy management,
- Level 3 - Objective Outcome measures & recent advances in rehabilitation

D) Overuse injuries
Pathomechanics, types, assessment, functional diagnosis based on ICF, surgical & physiotherapy management
- Level 3 - Recent advances in rehabilitation

Spine –
Conditions related to thoracic spine /cervical spine /lumbar spine Eg. torticollis, radiculopathy, myelopathy, mechanical pain, T.M.syndrome, Thoracic outlet syndrome, disc prolapse, lysis, listhesis, SI joint dysfunction (level I)
Aetiopathogenesis, assessment, functional diagnosis based on ICF, conservative & surgical management, complications, physiotherapy management,

- **Level 2** - Recent advances in rehabilitation

**General**

**A) Deformities-congenital & acquired**

Types- congenital (polio & cerebral palsy) & acquired – reconstructive surgery in polio & cerebral palsy, shortening of bone etc. pathomechanics, functional diagnosis based on ICF, physiotherapy management, prosthetic & orthotic management.

- **Level 2** - recent advances in rehabilitation, biomechanical considerations in prescription of prosthetics

**B) Arthritis of spine & extremity.**

Classification, path mechanics, assessment, functional diagnosis based on ICF, conservative & surgical management, complications, physiotherapy management, functional scales.

- **Level 2** - recent advances in rehabilitation and assessment, Protocols, functional scales, pathomechanics & management of other arthritic conditions like gout and psoriatic arthritis

**C) Rheumatic conditions-RA, SLE, ANKYLOSING SPONDYLITIS etc**

Type, pathomechanics, assessment, functional diagnosis based on ICF, conservative & surgical management, complications, physiotherapy management.

- **Level 2** - Recent advances in rehabilitation, functional scales

**D) Pelvic floor dysfunction, Common Gynecological surgeries,**

Type, Aetiopathogenesis, assessment, functional diagnosis based on ICF, conservative & surgical management, complications, physiotherapy management,

- **Level 2** - Recent advances in assessment & rehabilitation

**E) Pre & post operative management in pelvic & abdominal surgeries**

Types of incisions, functional diagnosis based on ICF, complications, physiotherapy management

**F) Complex Regional Pain Syndrome (CRPS)**
Aetiopathogenesis, Theories, assessment, functional diagnosis based on ICF, conservative management and surgical management, physiotherapy goals

**G) Vascular conditions affecting musculoskeletal structures** - AVN, perthes, hemophilia, compartment syndrome, Pathology, causes, complications, assessment, conservative & surgical management, physiotherapy management

**H) Infectious & inflammatory conditions affecting bones - tuberculosis, osteomyelitis**
Types, classification, complications, assessment, functional diagnosis based on ICF, conservative & surgical management, physiotherapy management  
- **Level 2** - recent advances in rehabilitation management

**I) Metabolic conditions - osteoporosis, osteopaenia, rickets etc**
Pathology, causes, complications, assessment, functional diagnosis based on ICF, conservative & surgical management, physiotherapy management  
- **Level 2** - bone density assessment.

**J) CA breast & management**
Causes, assessment, functional diagnosis based on ICF, complications, impairment, radiotherapy, chemotherapy, surgical intervention, physiotherapy management.

- **Level 2** - Advances in wound management

**K) Functional outcome scales**
1) Cervical spine-Neck Disability Index
2) Lumbar spine-ODI
3) Knee-WOMAC
4) Ankle & foot-FPI, SEBT
5) Shoulder-SPADI
6) Wrist & hand-DASH
7) Hip-Disability rating index

**CLINICAL**
Evaluation, Treatment Planning, Documentation & Presentation of cases -  
1]-# conditions affecting Upper Limb [including hand] (2 cases)  
2]-# / conditions affecting lower limb [including foot], (2 cases)  
3] Conditions affecting the Spine –Cervical, Thoracic & Lumbar (3 cases)  
4] General (3 cases)
**Textbooks:**

1. Cash’s Textbook of Orthopedics & Rheumatology for PTists – Patricia Downie
2. Therapeutic exercise – Kisner
4. Physical Rehabilitation – O’Sullivan
6. Orthopedic Physical Therapy – Donatelli
7. Neural tissue mobilization – Butler
8. Manual Therapy – Maitland
10. Muscle energy techniques – Leon Chaitow
11. Taping Tech - Mac Donald Rose
12. Essentials of Orthopedics for PTists- Ebnezer
13. Calliet series
14. Clinical Ortho Rehab - Brotzman

**Reference Books:**

1. Sports Physiotherapy - M. Zuluaga
2. Therapeutic Exercise - Carrie Hall & Brody
3. Rehab Medicine-Part I/II - Delisa
5. Orthotics and Prosthetic in Rehab - Lusardi
6. Hand Rehab - James Hunter
7. Campbell Operative Orthopedics- Canale Vol 1-4
8. Orthopedic Principles and their Applications- Turek Vol 1,2
9. Kinesiology - Carol A. Oatis
SCHEME OF EXAMINATION

THEORY-80 MRKS; I.A.-20 MARKS; TOTAL =100MARKS

CLINICAL-80 MARKS; I.A -20 MARKS TOTAL =100MARKS

1]-THEORY-Pattern of Paper setting  

Section-A-
M.C.Q Q-1]-[20 X 1] Single best answer  20 marks

Section-B
S.AQ.- Q-2 ]-To answer any FIVE out of Six—[5 x 3]  15 marks
- Q-3 ]-To answer any THREE out of Four-[3 x5 ]  15 marks

Section-C
L.AQ-. Q-4 ]  15 marks
  Q-5]  15marks

OR
  Q-6 ]  15 marks

CLINICAL  

1] One Long case  80 marks
35marks

[Time-not more than-30 minutes for Student & 15 minutes for examiner]

Psychomotor & Affective- [a]Skill during Clinical examination & Skill of objective assessment , correlating with other investigation -10 marks
b) Demonstration of appropriate treatment skill [e.g. manipulative skill] 15 marks]

Cognitive [Ability of Clinical decision making, Planning Short & long term goals with scientific justification -10 marks ]

2] One short case –based on Planning of treatment  20 marks

[Time-Not more than 15 minutes for student + 10 minutes for the examiner]

3] Spots-[Four]- Electrodiagnosis, simple X-rays, Orthotic- Prosthetic device, Scales etc--------------------------20 marks [5x4]
INTERNAL ASSESSMENT - 20 mks

One Terminal & one Preliminary exam. of 80 marks each in Theory & Clinical.

Marks to be calculated out of 20 each in Theory & Clinical.

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

1] The Theory examination will be as per University pattern

2] Clinical examination - as per University pattern.
NEURO PHYSIO THERAPY

Didactic  40 hrs
Clinical   95 hrs
Total     135 hrs

Objectives
At the end of the course, the candidate will –

1] Be able to detect abnormalities in neurodevelopment.

2] Be able to assess, identify & analyze neuro-motor & psychosomatic dysfunction in adult & paediatric & co-relate the finding with provisional diagnosis, interpretation of routine neurological investigations & arrive at functional diagnosis with clinical reasoning

3] Be able to understand the principles & acquire Neuro therapeutics skills

4] Be able to plan, prescribe & execute short term & long term goals with appropriate therapeutic interventions & be able to modify treatment techniques according to stage of disease.

Syllabus-
Following topics are applicable to all the Neurological conditions (Adult & Pediatric) included in the various clinical subjects of Medical Sciences taught in II & III B.P.T. course.

1] Understanding theories of motor control & motor learning

2] Understanding sensory system & organization of sensory strategies for efficient motor output.

3] Skills of sensory-motor learning & neuro-muscular skeletal training

A) Pediatric
- Detection of abnormalities in Neurodevelopment in terms of Maturational Reflexes, Reactions, Tone, Movement, Motor age, Posture, Balance & Locomotion & identification of Primary & Secondary dysfunction
- Screening for high risk babies & role of early intervention
- Plan short & long term goals based on ICF and implement appropriate treatment programme
- **Level 2**: Detection of abnormalities in Neurodevelopment in terms of mental age. Recent advances in treatment in the above-mentioned conditions

**i] Upper Motor Neuron Lesions**

1] Different types of Cerebral Palsy

2] Head Injury

- **Level 2**: Infective diseases of CNS: Meningitis, Encephalitis, Tetanus, Space Occupying Lesions etc.,

**ii] Lower Motor Neuron lesions** –

1] Spinal dysraphysm, hydrocephalus, SMA etc.

2] Polio myelitis- **Level 2**

**iii] Muscle disease**

Musculo dystrophies (Duchenne Muscular Dystrophy, Becker Muscular Dystrophy)

**iv] ADHD, Autism, Down 's syndrome, Learning disability**- **Level 2**

**B] Adult**

Planning short term & long term goals & formulating treatment programme based on ICF for all the topics given as follows-

- **Level 2**: Recent advances in treatment

- **Central Nervous System**

1] Disorders of circulation

2] Space occupying lesions- Cortical, Cerebellar, Thalamic & Brain-stem

- **Level 2**

3] Head injury

4] Cranial nerves-emphasis on & 7th & 8th nerves

5] Demyelinating diseases of the CNS-Multiple sclerosis

6] Lesions of Extra-pyramidal system & Basal ganglia-Parkinsonism and Parkinson’s disease, Cerebellar Ataxia

- **Level 2**: Chorea, Athetosis, Dystonia, Spasmodic torticolis
• **Spinal Cord**

1] Infective disorders of spinal cord – Transverse myelitis,

    - **Level 2**: Tabes Dorsalis, Meningitis, Encephalitis etc.

2] Degenerative disorders- Motor Neuron Disease, Alzheimer’s disease

3] Traumatic – Paraplegia etc.

4] Space Occupying Lesions

5] Polyneuropathy - Sub-acute combined degeneration, Guillain Barre Syndrome, Alcoholic, Diabetic neuropathy, Leprosy

6] Syringomyelia Hereditary Ataxia, Peroneal muscular atrophy, S.M.A

7] Disorders of peripheral nerves - tumours, infective & metabolic lesions of nerves

• **Muscle Diseases**

1] Limb girdle dystrophy, facioscapulohumeral dystrophy

2] Myopathies

• **Psycho-somatic Pain**

* Treatment programme includes

  a) Application of appropriate Electro-therapeutic modes for relief of pain & functional restoration
  b) Application of neuro therapeutic skills like PNF, NDT, Carr & Shepherd, Brunnstrom & Rood’s
  c) Co ordination & balancing exercises by using techniques based on neuro physiological principles
  d) Tools used for neuro rehabilitation like vestibular balls, tilt board etc.
  e) Application of transfer & functional re-education exercises, postural exercises & gait training
  f) Bladder training
  g) Developing a philosophy for caring
  h) Prescription for appropriate orthotic devices & fabrication of temporary splints.
  i) Ergonomic advice for prevention / rehabilitation & parents / care givers’ education about handling of a patient
  j) Applied Psychology for Physiotherapists
**CLINICAL-**

Evaluation & treatment planning; documentation & presentation of minimum Four cases in 1] Paediatric neuro case, Three cases each in 2] U.M.N. lesion (Adult) 3] L.M.N. lesion (Adult)

**Textbooks:**

1. Cash’s Textbook for Physiotherapists in Neurological conditions- Patricia Downie
2. Physical Rehabilitation – O’Sullivan
3. Steps to follow – Patricia Davies
4. Motor Control theory & practical Application – Shumway Cook
5. Treatment of CP & motor delay - Sophie Levitt
6. Neurological Rehab – Darcy Umphred
7. Normal Child – Illingworth

**Reference Books:**

1. Stroke Rehab – Margaret Johnstone
2. Brains diseases of Nervous system - Michael Donaghy
3. PNF in practice – Adler
4. Right in the Middle- Patricia Davies
5. Optimizing motor control – Carr & Shepherd
6. Adult Hemiplegia – Bobath
7. Starting again – Patricia Davies
8. Spinal cord injury - Buchanan
9. Tetraplegia & Paraplegia - Ida Bromley
10. Rehab Medicine-Part I/II - Delisa
SCHEME OF EXAMINATION

THEORY-80 MRKS; I.A.-20 MARKS; TOTAL =100MARKS

CLINICAL-80 MARKS; I.A -20 MARKS TOTAL =100MARKS

1]-THEORY-Pattern of Paper setting

Section-A-
M.C.Q Q-1].-[20 X 1] Single best answer 20 marks

Section-B
S.AQ.- Q-2 |-To answer any FIVE out of Six—[5 x 3] 15 marks
- Q-3 |-To answer any THREE out of Four-[3 x5 ] 15 marks

Section-C
L.AQ-.Q-4 ] 15 marks
Q-5] 15marks

OR
Q-6 ] 15 marks

CLINICAL

1] One Long case 80 marks
[Time-not more than-30 minutes for Student & 15 minutes for examiner]

Psychomotor & Affective- [a]Skill during Clinical examination & Skill of objective assessment , correlating with other investigation -10 marks
b) Demonstration of appropriate treatment skill [e.g. manipulative skill] 15 marks

Cognitive [Ability of Clinical decision making, Planning Short & long term goals with scientific justification -10 marks ]

2] One short case –based on Planning of treatment 20 marks
[Time-Not more than 15 minutes for student + 10 minutes for the examiner]

3] Spots-[Four]- Electrodiagnosis, Orthotic- Prosthetic device, Scales,Equipments for therapy etc---------------------------20 marks [5x4]

4] Documentation 5 marks
INTERNAL ASSESSMENT

- 20mks

One Terminal & one Preliminary exam. of 80 marks each in Theory & Clinical.

Marks to be calculated out of 20 each in Theory & Clinical.

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

1] The Theory examination will be as per University pattern

2] Clinical examination - as per University pattern.
Goals:

The broad goal of teaching undergraduate students Cardiopulmonary and Integumentry Physiotherapy is to provide comprehensive knowledge about the Physiotherapy interventions in various Cardiac, Pulmonary, vascular and Integumentry conditions and to teach skills to practice as a qualified Physiotherapist.

Objectives

At the end of the course, the candidate will -

1] Identify, discuss & analyze cardio-vascular & pulmonary dysfunction in adult & pediatric, based on Biomechanical & Patho-physiological principles & arrive at the appropriate functional diagnosis

2] Acquire knowledge of rationale of basic investigative approaches in the medical system& surgical intervention regimes related to cardio-vascular & pulmonary impairment & peripheral vascular conditions


4] Be able to select strategies for cure, care & prevention; adopt restorative & rehabilitative measures for maximum possible functional independence of a patient at home, work place & in community.

5] Be able to execute the effective Physio Therapeutic measures in adult & pediatric with appropriate clinical reasoning to improve pulmonary function.

6] Be able to design & execute effective tailored cardiac rehabilitation programme.

7] Acquire knowledge of the overview of patients care at the Intensive care area.

8] Acquire knowledge of different integumentary conditions and methods of skin care.

9] Be able to execute the effective Physio Therapeutic measures in adult & pediatric condition with appropriate clinical reasoning.
Syllabus-
The following topics are applicable to all the adult & paediatric cases related to cardiovascular, pulmonary and Integumentry conditions covered in the syllabus of III B.P.T. programme.

1] Physical Assessment (as per 3rd BPT Physical Diagnosis & Therapeutic Skills syllabus)

2] Interpretation of following investigations & co-relate the same with clinical findings

Chest X-rays, ABG’s, ECG (relevant to ischemic conditions and enlargement/hypertrophy of heart chambers), Spirometry and flow volume loops, and Routine Biochemical investigations

- **Level 2**: ECG (relevant to bundle blocks), Echocardiography, CT chest, Doppler studies, Angiography
- **Level 3**: MRI/CT heart

3] Functional diagnosis - ICF

4] Functional Capacity

Assessment based on VO2 max and METs (indirect method??)

- **Level 2**: Direct assessment of VO2max

5] Fitness training in prevention and management of cardiopulmonary conditions

Exercise prescription, FITT principle. To consider effect of pharmacological agents during exercise testing and training.

- **Level 2**: Telemetry, Pedometer, Lactate meter, Accelerometer, body fat analyser

6] Planning short & long term goals with clinical reasoning for the following

a) Cardiac Disorders –
Congenital /Rheumatic cardiac conditions, /Acquired cardiac conditions- IHD (including Lifestyle modification). Physiotherapy management in Pre and Post Cardi-thoracic surgeries relevant to cardiac conditions. Cardiac rehabilitation. Prescription of home programme & ergonomic advice / parents education in paediatric cases

- **Level 2**: Rhythm Disturbances (including Pacemakers)
b) **Pulmonary Disorders** –
Application of appropriate skills for breathing re-training & bronchial hygiene as preventive [used specifically in preoperative care], restorative & rehabilitative measures. Adult and Paediatric: Obstructive, Restrictive, Occupational respiratory conditions. Physiotherapy management in Pre and Post thoracic surgeries relevant to pulmonary conditions. Pulmonary Rehabilitation. Introduction to commonly used devices in pulmonary clearance. Prescription of home programme & ergonomic advice / parents education in paediatric cases
- **Level 2**: Autogenic drainage
- **Level 3**: Advances in Pulmonary clearance techniques like CLRT, insufflation-exsufflation, IPV

c) **Peripheral Vascular Diseases**
i) Physiotherapy management of peripheral Arterial diseases including ulcers, amputation.
ii) Physiotherapy management of peripheral Venous diseases
iii) Physiotherapy management of Lymphatic conditions
iv) Prescription of appropriate footwear

d) **Intensive Care Unit**
Mechanical ventilation-Basic modes like Pressure/volume support, CMV, A/C, SIMV, PEEP, CPAP, weaning off the ventilator, Techniques and equipments for Manual hyperinflation, Intubations, Suctioning, Oxygen therapy, equipments for Continuous monitoring of patients, Measures to improve bronchial hygiene like breathing exercises, modified PD, Positioning for bronchial hygiene, equipments like Flutter, and General Mobilisation
- **Level 3**: Advanced modes of mechanical ventilation like NIPPV, Bi-level positive airway pressure, High frequency ventilation

e) **Integumentry conditions**
Physiotherapy management in Burns, Wound –Use and application of electrotherapeutic modalities for wound management, Vitiligo, Psoriasis, Scleroderma, Scar management, Skin care in neurological conditions

7) **Prescription of home programme & ergonomic advice / parent’s education in case of Paediatric cases with reference to energy cost.**

**CLINICAL**-
1] Skill to assess Cardiac & Pulmonary dysfunction – heart rate, pulse [quality, rate, rhythm & volume], B.P. measurement - Physiological variation, Ankle-Brachial Index, chest expansion and excursion, Skill of exercise testing – a) 6 minute walk test b) symptom limited
2] Interpretation of
   a) Treadmill & Ergo-cycle test findings
       b) ECG.-I.H.D.
       c) Biochemical analysis- serum enzymes, C.P.K levels, L.D.H., S.G.O.T., S.G.P.T. Lipid profile, electrolyte balance
       d) Chest X-ray
       e) P.F.T.- obstructive/ restrictive/reversibility
       f) A.B.G.
       g) R.P.E.- Borg’s scale

3] Evaluation & treatment planning, documentation & presentation of ONE case each in-
   a] Pulmonary Medical condition
   b] Pulmonary Paediatric condition
   c] Pulmonary Surgical condition
   d] Cardiac Medical condition
   e] Cardiac Surgical condition
   f] Cardiac paediatric condition
   g] Peripheral Vascular Disorders
   h] Amputation
   i] Wound
   j] Burns/Dermatological conditions

Textbooks:
1. Cash’s Textbook for Physiotherapists in Chest, Heart & Vascular diseases – Patricia Downie
2. Cash’s Textbook in Gen. Medical & Surgical conditions – Patricia Downie
4. Pulmonary Physiotherapy – Hass
5. Exercise Physiology - Mc Ardle
6. Physical Reahb – O’Sullivan
7. Exercise testing & Exercise prescription for special cases - J. Skinner
8. PT for Resp & cardiac problems - Pryor & Prasad
9. Cardiopulmonary physical Therapy - Irwin Scott

**Reference Books:**
1. ECG – P.J. Mehta
2. Mechanical Ventilation – Pierce
3. Braunwald’s heart disease - Libby, Peter
4. ACSM (set of 3 books)
5. Rehab Medicine-Part I/II - Delisa

**SCHEME OF EXAMINATION**

THEORY-80 MRKS; I.A.-20 MARKS; TOTAL =100MARKS
CLINICAL-80 MARKS; I.A -20 MARKS TOTAL =100MARKS

1]-THEORY-Pattern of Paper setting 80 marks

**Section-A-**
M.C.Q Q-1].-[20 X 1] Single best answer 20 marks

**Section-B**
S.AQ.- Q-2 |-To answer any FIVE out of Six—[5 x 3] 15 marks
  - Q-3 |-To answer any THREE out of Four-[3 x5 ] 15 marks

**Section-C**
L.AQ-.Q-4 ] 15 marks
Q-5] 15marks

OR 15 marks

15 marks
CLINICAL

1] One Long case

[Time-not more than-30 minutes for Student & 15 minutes for examiner]

Psychomotor & Affective- [a)Skill during Clinical examination & Skill of objective assessment, correlating with other investigation -10 marks  b) Demonstration of appropriate treatment skill [e.g. manipulative skill] 15 marks]

Cognitive [Ability of Clinical decision making, Planning Short & long term goals with scientific justification -10 marks ]

2] One short case –based on Planning of treatment 20 marks

[Time-Not more than 15 minutes for student + 10 minutes for the examiner]

3] Spots-[Four]- based on ABG; PFT; X-Ray Chest; Lipid profile; routine biochemical investigations ; ECG; equipments like AMBU, Pulse oximeter, , suction catheter etc; intubations ; Protocols/QOL questionnaire [5x4]

20 marks

INTERNAL ASSESSMENT -20 mks

One Terminal & one Preliminary exam. of 80 marks each in Theory & Clinical.

Marks to be calculated out of 20 each in Theory & Clinical.

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

1] The Theory examination will be as per University pattern

2] Clinical examination - as per University pattern.
**Objectives** - At the end of the course, the candidate will-

A] Be able to describe

1. The general concepts about Health, Disease & Physical fitness
2. National policies for the rehabilitation of disabled – role of IAP to promote physiotherapy as a health delivery system
3. the strategies to assess prevalence & incidence of various conditions responsible for increasing morbidity in the specific community, role of physiotherapy in reducing morbidity, expected clinical & functional recovery, reasons for non-compliance in specific community & environmental solution for the same
4. the evaluation of disability & planning for prevention & rehabilitation
5. C.B.R.- in urban & rural set up, WHO policies, concept of team work, role of multi-purpose health worker

B] Be able to identify with clinical reasoning the prevailing contextual (environmental & psycho-social, cultural) factors, causing high risk responsible for various dysfunctions & morbidity related to lifestyle & specific community like women, aged ,industrial workers & describe planning strategies of interventional policies to combat such problems

1. Woman & Child care - altered mechanics and Physiological function due to pregnancy, labor and parity, menopause,menarche, Nutritional Problems, Care of pre-term babies and adolescent age group
2. Geriatrics - physiology of aging & its influence on physical fitness
3. Industrial health - Accidents and Hazards
4. Health promotion – role of PT in health for all

C] Be able to conduct a project (Retrospective/survey) – collection of anthropometric
Data for morbidity assessment in various conditions, Interpretation and advise with clinical reasoning at Urban / Rural Community or Institutional level

**Syllabus**-

1) **Concepts of community health** [preventive, promotive, restorative and Rehabilitative]

2) **WHO definition of health and disease**

3) **Health delivery system** – 3 tier

4) **Disability types** (Physical & Psychological), evaluation, prevention & Legislation related to Persons with Disability (PWD)

5) **Community Health** – definition, principles, types (institutional, reach out and community), concepts,
   - Level 2: WHO policies, principles of Team work
   - Role of PT in team, Concept of multi-purpose health worker
   - Communication Strategies. Role of PT and strategies in 3 tier Health delivery system

6) **Health Care** – Prevention, Health Promotion and Restoration in various sectors of community
   a. **Age**: In Paediatric, adolescent, adult and geriatric population
   b. **Gender**: Males, Females
   c. **Occupation**
   d. **Sport Person** (Identify risk factor & type of training)
   e. **Women’s Health**
   f. **Lifestyle Disorders**:
      1. Stress
      2. Hypertension
      3. IHD
      4. Diabetes
      5. Over weight/ Obesity/
   g. **Diet and Nutrition**:
      1. Balanced Diet
      2. Diet in Hypertension, Diabetes, Pregnancy Lactation, Obesity, Sports
      3. Bone health in Adults & Paediatrics age group
7] **Woman and child care** –

I. Antenatal exercises, Specific Breathing exercises, Relaxation, Postural Training, Pelvic floor stretching and strengthening exercises with clinical reasoning

II. Physiotherapy during labor

III. Postnatal exercises program after normal labor / labor with invasive procedures with clinical reasoning

IV. Menopause - Osteoporosis, Mental health, Physiotherapy management

V. Preterm babies

VI. Adolescent age group

VII. **Level 2**: Nutritional disorders in women and children

8] **Geriatrics** – Physiology of Aging, Environmental changes and adaptations, Balance and falls, Physiotherapy management, Role of Physiotherapy in prolonged bed rest and in home for aged

9] **Industrial health** -

I. **Ability Management** -

Job analysis: - Job description, Job demand Analysis, Task Analysis, Ergonomic Evaluation including Anthropometric data collection, Injury Prevention, Employee Fitness Programme

Disability Management: - Acute care, Concept of Functional Capacity Assessment, Work Conditioning, Work Hardening

II. **Environmental stress in the industrial area** –

A. **Level 2**: Physical agents e.g. heat / cold, light, noise, vibration, UV radiation, ionizing radiation

B. **Level 2**: Chemical agents-inhalation, local action and ingestion

C. Mechanical hazards-overuse/fatigue injuries due to ergonomic alternation and Mechanical stresses

Mechanical stresses in –

i. Sedentary table work – executives, clerks

ii. Vehicle drivers - Inappropriate seats, Vibrations

iii. Constant standing-watchmen, defense forces, surgeons etc.

iv. Labourers- Overexertion

D. **Level 2**: Psychological hazards- monotonicity and dissatisfaction in job, anxiety of work completion with quality, Multi-task activities

III. Preventive and Rehabilitative Role of PT in II A, B, C & D
CLINICAL:

Visits to Urban Health Centre & Primary Health Centre.

Project – Survey/Retrospective study in community. Prospective studies with simple assessment techniques such as anthropometric measurements, BP, HR, RR.

Documentation of 2 cases each in a) Women’s Health b) Geriatrics & c) Industrial Health (Musculoskeletal / Pulmonary conditions)
d) Health promotion – 1 case each in i) Obesity ii) Peri-pubertal age group iii) Sports person iv) Diabetes / Cardio-Pulmonary conditions

Textbooks:

1. Therapeutic exercise – Kisner
2. Industrial Therapy – Glenda Key
4. Geriatric Physical therapy - Andrew Guccione
5. ACSM (set of 3 books)
6. P.S.M. - Park
7. Textbook of Women’s Health – Ruth Sapsford
8. Legal Rights of Disabled – RCI
9. Locomotor disabled – RCI

Reference Books:

1. Physiotherapy in obstetrics & Gynecology -J. Mantle
2. Textbook of Work Physiology – Astrand
3. Exercise Physiology - Mc Ardle
4. Ergonomics: Man in working environment – Mural
5. Ergonomics- Karen Jacobs
6. Occupational disorders – Hunter
7. Occupational injuries – Herrington
8. Msk disorders in the work place – Nordin
10. Exercise testing & Exercise prescription for special cases - J. Skinne
11. Sports Injuries – Zuluaga
12. Methods in Biostatistics – Mahajan
13. Rehab Medicine-Part I/II - Delisa
INTERNAL ASSESSMENT -20 mks

One Terminal & one Preliminary exam. of 80 marks each in Theory & Clinical.

Marks to be calculated out of 20 each in Theory & Clinical.

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

1] The Theory examination will be as per University pattern
2] Clinical. exam. for P.T. in Community Health shall include

Terminal (80 marks)

1] Any two cases from a to d – 35 marks each
a) Woman & child care
b] Geriatrics
c) Industrial Health
d] Health promotion

2] Viva on project questionnaire 10 marks

Preliminary (80 marks)

1] 1 long case of 35 marks from a to d
   a) Woman & child care
   b) Geriatrics
   c) Industrial Health
d) Health promotion

2] Project presentations 40 marks
   (15 marks for content + 10 marks for Audio visual + 15 marks for Question Answers)

3] Documentation of cases 5 marks
SCHEME OF EXAMINATION

PHYSIOTHERAPY IN COMMUNITY HEALTH

THEORY-80 MRKS; I.A.-20 MARKS; TOTAL= 100 MARKS

CLINICAL-80 MARKS; I.A -20 MARKS TOTAL=100 MARKS

1] THEORY-Pattern of Paper setting 80 marks

Section-A
M.C.Q Q-1].[20 X 1] Single best answer 20 marks

Section-B
S.AQ.- Q-2] To answer any FIVE out of Six—[5 x 3] 15 marks
Q-3]-To answer any THREE out of Four-[3 x 5 ] 15 marks

Section-C
L.AQ-.Q-4] 15 marks
Q-5] 15marks

OR
Q-6] 15 marks

CLINICAL

a] A Long Case based on Women’s Health/ Geriatrics/ Health Promotion / Industrial Health 35 marks

b] Project presentation [15 marks for content + 10 marks for audiovisual + 15 marks for question answers ] 40marks

c] Documentation 5 marks
Objectives-

At the end of the course, the candidate shall

1] Acquire knowledge about biomechanical principles, of application of variety of aids & appliances used for ambulation, protection & prevention

2] Acquire in brief knowledge about various materials used for splints/orthoses & prostheses and selection criteria for the aid

3] Acquire the skill of fabrication of simple splints made out of low cost material

Syllabus—

1] Classification of Aids & Appliances

2] Biomechanical principles in designing of appliances & assessment procedures for static & dynamic alignment of the following Aids & Appliances - Splints /Orthoses for spine and upper & lower extremities/ Prostheses for Upper and Lower limbs

3] Project- Following temporary splints to be fabricated by using P.O.P/ aluminum strips /sheets /wires / rubber bands / rexin / Orfit etc
   I. cock up [dorsal/volar,
   II. outrigger,
   III. Opponens splint
   IV. Anterior and posterior guard splints,
   V. Foot drop splint
   VI. Facial splint
   VII. Mallet Finger Splint
   VIII. C bar for 1st web space of hand

Textbooks:

1. Atlas of Orthotics - AAOS

2. Orthotics and Prosthetic in Rehab – Lusardi

Reference Books:

1. Hand Splinting – Wilton
SCHEME OF EXAMINATION - *(COLLEGE EXAMINATION)*

THEORY - 20 MCQs, 20 MARKS (20 Minutes)

PROJECT - 30 MARKS

TOTAL - 50 MARKS
PROFESSIONAL ISSUES /ADMINISTRATION /MANAGEMENT & MARKETING

SECTION-I-PROFESSIONAL ISSUES

Objectives

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

Contents


2] Constitution & Functions of the Indian Association of Physiotherapists

3] Functioning of the World Confederation of Physical therapy [WCPT] & its various branches, Special Interest groups in brief

4] Role of WHO & WCPT

SECTION-II-ADMINISTRATION/MANAGEMENT & MARKETING

Objectives

At the end of the course the student will acquire the knowledge of the basics in Managerial & Management skills, use of Information Technology in professional Practice

Contents-

1] Management studies related to local health care organization, Management & Structure, Planning delivery with quality assurance & funding of service delivery, Information Technology, Time Management , Career development in physiotherapy

2] Administration-principles based on the Goal & Functions at large hospital set up / domiciliary services/ private clinic /academic institute

3] Methods of maintaining records

4] Budget planning
5] Performance analysis - physical structure, reporting system [man power, status functions, quantity & quality of services, turn over, cost benefit, revenue contribution

Textbooks:

1. Textbook of management - Philip Kotler

**SCHEME OF EXAMINATION**

* [COLLEGE EXAMINATION] TIME-2 hrs

THEORY - SECTION I - 25 MARKS + SECTION II-25 MARKS = 50 MARKS
RESEARCH METHODOLOGY & BIOSTATISTICS (25 HRS)

Objectives

At the end of the course the student will acquire the knowledge of the basics in Research Methodology & Biostatistics

Syllabus


2) Data Collection: Collection of primary data, observation method, interview method, data through questionnaires & schedules, collection of secondary data, selection of appropriate method of data collection, guidelines for developing questionnaire, Interview methods, Survey vs Experimental method

3) Processing & Analysis of data: Data analysis, Statistics & Research, measures of central tendency, Dispersion, Asymmetry, Relationship, and Regression Analysis.

4) Testing of Hypothesis: Parametric tests, Non Parametric tests (Distribution free tests), Design & Analysis of Experiments.

5) Ethical Concepts in Research

6) Role of Computer in Research

Text book

1] Methods in Biostatistics - B.K. Mahajan
2] Research for Physiotherapists, project design & Analysis- Hicks, Carolyn D.M.
3] Foundations of clinical research: Applications to practices – L.G. Portney

Scheme of examination

*College examination Time – 2 Hrs

Theory – section 1 – 25mks (Research methodology) section 2 – 25 mks (Biostatistics) = 50 mks
## PATTERN OF EXAMINATION- IV B.P.T.

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<tr>
<th>Sr. No</th>
<th>Subject</th>
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<td>P.T. in Musculoskeletal conditions</td>
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*-COLLEGE EXAMINATION* passing in each college examination is mandatory to appear for university examination. The marks obtained in the respective college examination shall be converted in to GRADES

#GRADE - A+: 75 % & above, A: 66 to < 75%, B+: 55 to <66%, B: 50 to <55%, C: <50% [FFF]