

KERALA UNIVERSITY OF HEALTH SCIENCES

THRISSUR – 680 596, KERALA



**REGULATIONS, CURRICULUM, AND
SYLLABUS OF**

**BACHELOR OF PHYSIOTHERAPY
(B. P. T)**

(With effect from 2012-13 onwards)

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SECTION – 1

Aims and objectives of the course

As per WHO's International Classification of Health Workers*, based on the International Standard Classification of Occupations (ISCO, 2008 revision) - "Physiotherapists assess, plan and implement rehabilitative programs that improve or restore human motor functions, maximize movement ability, relieve pain syndromes, and treat or prevent physical challenges associated with injuries, diseases and other impairments. They apply a broad range of physical therapies and techniques such as movement, ultrasound, heating, laser and other techniques. They may develop and implement programmes for screening and prevention of common physical ailments and disorders."

This undergraduate course in Physiotherapy (BPT) is to impart in depth knowledge and skill to a student to become competent in the techniques and develop the proper attitude required for the independent practice of physiotherapy.

*www.who.int/hrh/statistics/workforce **HYPERLINK**
"http://www.who.int/hrh/statistics/workforce_statistics" statistics

Objective of the study

- i. Acquisition of adequate theoretical and the practical knowledge foundation in the basic medical subjects.
- ii. Proficiency in the skills of basic physiotherapy procedures and techniques with adequate theoretical basic of allied science.
- iii. Ability to detect patho-physiological impairment of structural and functional deviations by using methodology of physical diagnosis to evaluate the disability prognosis.
- iv. Competency in imparting the physiotherapeutic measure of specific choice towards preventive, curative, symptomatic and restorative or rehabilitative goals.
- v. Acquisition of moral and ethical codes and conduct of professional practice in a dedicated manner with the patient welfare as the primary responsibility.
- vi. After achieving competency and skill a physiotherapist should practice physiotherapy, and carry out treatment as an independent practitioner or in consultation & reference with other medical practitioners.

SECTION – 2

Regulations

2.1 Minimum qualification for the admission of the course

Candidates who have passed higher secondary examination of the Board of higher secondary education, Kerala or equivalent there to, 50% Marks in biology separately and 50% marks in physics, chemistry, and biology together are eligible.

2.2 Selection of Students

The selection of students for the BPT course shall be made strictly on merit as decided by the Govt of Kerala/Kerala University of Health Sciences and as per guidelines of the respective council.

2.3 Registration

A candidate on admission to the BPT course shall apply to the University for Registration

- By making a formal application in the prescribed format.
- Original mark lists of the qualifying examination.
- Transfer certificate from the previous institution.
- Allotment letter from the competent authority who conducted the admission process
- Equivalency and migration certificate where ever needed.
- Original SSLC/Equivalent Certificate.
- The fees prescribed for the registration.

2.4 Duration of the course and period of completion

The duration of the course shall be four and half years including Compulsory Internship of six months. A candidate seeking admission to Bachelor of physiotherapy course should have completed seventeen years of the age, as on 31st December of the year of the admission. Every candidate before admission to the course shall furnish to Principal of the institution a certificate of the medical fitness from the authorized government medical officer, to the effect, that the candidate is physically fit to undergo Physiotherapy course.

2.5 Medium of instruction and examinations

Medium of instruction and examinations shall be in English.

2.6 Attendance, progress and condonation

A candidate is required to put in at least 80% attendance in theory and practical subjects separately in a recognized institution approved by and affiliated to Kerala University of health sciences.

The candidate shall complete the prescribed course satisfactorily to be eligible to appear for the respective examination. The Condonation of attendance shall be done by the Principal in consultation with the college governing council. The condonation limited to Maximum of 10% attendance for a subject once in a course and for one time only.

2.7 Internal assessment marks

Three internal examinations shall be conducted in each subject during a year and average marks of two best performances shall be taken into consideration for the award of internal marks. Marks of Evaluation by other methods like assignments, seminars, projects etc.. can be added to the internal marks. A candidate must obtain 50% of marks in internal assessment to be eligible to write the university examination. The class average of internal assessment marks should not cross 75%.

2.8 Criteria for Pass

A candidate shall be declared as pass if he secures 50% of marks in each subject in theory and practical examinations separately. A candidate shall also secure a minimum aggregate of 50% marks in theory section which includes university theory examination, viva voce (if applicable) and internal assessment and in the practical section a candidate shall secure 50% aggregate marks which includes university practical and internal assessment. In all papers with section A and B only an aggregate total of 50% mark is needed to pass the paper. A candidate who fails in theory or practical exams in a subject shall appear for both theory and practical in that subject in the subsequent examination.

2.9 Practical Examination: Maximum number of candidates for practical examination shall not exceed 15 per day for the Physiotherapy Papers.

TABLE – 1

FIRST YEAR BPT (DURATION 0 – 12 MONTHS)						
Sl. No:	Subject	Teaching hours				
		Weekly class hrs. (approx)	Total	Theory	Practical	

<i>Main subjects: For University Examination</i>					
1.	Anatomy	8	240	150	90
2.	Physiology	8	240	150	90
3.	Biomechanics & Kinesiology	6.5	200	150	50
4.	Section A – Psychology	3	180	90	-
	Section B – Sociology	3		90	-
<i>Subsidiary subjects: Not for University Examination</i>					
5.	First Aid & Nursing	2	40	20	20
6.	Orientation to Physiotherapy	3	100	100	
7.	Section A - Biochemistry	2	100	40	10
	Section B - Nutrition	2		40	10
8.	Clinical Observation	5	150		
9.	Seminar	1	40		-
	Total	40	1370		

TABLE – II

SECOND YEAR BPT (DURATION 13 – 24 MONTHS)		
Sl. No:	Subject	Teaching hours

		Weekly class hrs.(approx)	Total	Theory	Practical	
<i>Main subjects: For University Examination</i>						
1	Electrotherapy	8	240	80	160	
2	Exercise therapy	8	240	80	160	
3	Pharmacology	3	90	90	-	
4	Section A – Microbiology	2	120	60	-	
	Section B – Pathology	2		60	-	
<i>Subsidiary subjects: Not for University Examination</i>						
8.	Computer Science	2	60	30	30	
7.	Supervised Clinical Observation	8.5	250	-	-	
9.	Medical Instrumentation	1	20			
10	Seminar	1	40			
	Total	42	1060			

TABLE – III

THIRD YEAR BPT (DURATION 25 – 36 MONTHS)						
Sl. No:	Subject	Teaching hours				
		Weekly class hrs.(approx)	Total	Theory	Practical	

<i>Main subjects: For University Examination</i>						
1.	General Medicine & General Surgery	3	90	90	-	
2.	Physiotherapy in General Medicine & General Surgery	8	240	90	150	
3.	Clinical Orthopedics & Sports Medicine	3	90	90	-	
4.	Physiotherapy in Orthopedics & Sports	8	240	90	150	
5.	Rehabilitation science	3	90	30	60	
<i>Subsidiary subjects: Not for University Examination</i>						
6.	Supervised Clinical Practice	16.5	500	-	-	
7.	Seminar	1	40	-	-	
8.	Research methodology & Biostatistics	1	30	-	-	
	Total	44	1320	-	-	

TABLE – IV

FORTH YEAR BPT (DURATION 37– 48 MONTHS)						
Sl. No:	Subject	Teaching hours				
		Weekly class hrs(approx).	Total	Theory	Practical	
<i>Main subjects: For University Examination</i>						

1.	Clinical Neurology & Neurosurgery	3	90	90	-	
2.	Physiotherapy in Neurology & Neurosurgery	8	240	90	150	
3.	Clinical Cardio-Respiratory disorders & Surgery	3	90	90	-	
4.	Physiotherapy in Cardio-Respiratory disorders & Intensive Care management	8	240	90	150	
5.	Physiotherapy in Community Health	8	240	90	150	
<i>Subsidiary subjects: Not for University Examination</i>						
6.	Ethics and Management	1	20	20	-	
7.	Supervised Clinical Practice and Project	16.5	500	-	-	
	Total	48	1420			

2.9. Schedule of the examination

There will be two examinations in a year (regular and supplementary), to be conducted as per notification issued by university from time to time. First, second, third and final Examinations of the BPT course shall be held at the end of first year, second year, third year and fourth year respectively. Supplementary examination shall be conducted by the university for the benefit of unsuccessful candidates. The supplementary examination shall be conducted within six months from the date of announcement of results.

The particulars of the subjects for various examinations and distributions of marks are shown separately in the scheme of examination.

2.10. Scheme of examinations

SCHEME OF EXAMINATION**I Year BPT**

S.No	Subject	Theory				Practical			Grand Total
		University Written	Viva	Internal assessment	Total	University exam	Internal Assessment	Total	
1	Anatomy	100	30	20	150	50	-	50	200
2.	Physiology	100	30	20	150	50	-	50	200
3.	Biomechanics and Kinesiology	100	-	20	120	-	-	-	120
4.	Section A Psychology	50	-	10	120	-	-	-	120
	Section B Sociology	50	-	10		-	-	-	

SCHEME OF EXAMINATION**II Year BPT**

S.No	Subject	Theory				Practical			Grand Total
		University Written	Viva	Internal assessment	Total	University exam	Internal assessment	Total	

2.	Electro therapy	100	30	20	150	80	20	100	250
3.	Exercise Therapy	100	30	20	150	80	20	100	250
4.	Pharmacology	50	-	10	60	-	-	-	60
4.	Section A Microbiology	50	-	10	60	-	-	-	120
	Section B Pathology	50	-	10	60	-	-	-	

SCHEME OF EXAMINATION

III Year BPT

S.No	Subject	Theory				Practical			Grand Total
		Univer sity Written	Viva	Internal assessment	Total	University exam	Internal assessment	Total	
1	General Medicine & General Surgery	50	-	10	60	-	-	-	60
2.	Physiotherapy in General Medicine & General Surgery	100	30	20	150	80	20	100	250
3.	Clinical Orthopaedics and Sports	50	-	10	60	-	-	-	60

	Medicine								
4.	Physiotherapy in Clinical Orthopaedics and Sports Medicine	100	30	20	150	80	20	100	250
5.	Rehabilitation Science	100	-	20	120	-	-	-	120

SCHEME OF EXAMINATION

IV Year BPT

S.No	Subject	Theory				Practical			Grand Total
		Univer sity Written	Viva	Internal assessment	Total	University exam	Internal assessment	Total	
1	Clinical Neurology and Neurosurgery	50	-	10	60	-	-	-	60
2	Physiotherapy in Clinical Neurology and Neurosurgery	100	30	20	150	80	20	100	250
3.	Clinical Cardio respiratory disorders and surgery	50	-	10	60	-	-	-	60

4.	Physiotherapy in Cardio respiratory and Intensive care management	100	30	20	150	80	20	100	250
5.	Physiotherapy in Community Health	100	-	20	120	-	-	-	120

PAPER SETTING PATTERN

Total Marks - 100, Time: 3Hrs

Q1. Structured Essays - Nos 2x14 marks = 28 Marks

Q2. Brief structured essay – Nos 4 x 8 marks = 32 Marks

Q3. Short Answers - No10 x 4marks = 40 Marks

Total - 100 Marks

Total Marks - 50, Time: 1 ½ Hrs

Q1. Structured Essays - Nos 1x14marks = 14 Marks

Q2. Brief Structured Essays – 2 Nos x 8 marks = 16 Marks

Q3. Short Answers - 5No x 4marks = 20 Marks

Total - 50 Marks

In the subject Anatomy - Essay Questions should be from the Musculoskeletal, Nervous system including sense organs and Cardio respiratory System

In the subject Physiology - Essay Questions should be from Musculoskeletal, Nervous system including sense organs, Cardio respiratory System, Exercise physiology

In Sociology & Psychology, Pathology, Microbiology, Pharmacology and all Clinical Subjects - Essay Questions should be from areas relevant to practice of Physiotherapy

BROAD GUIDELINES

Structured Essay should be explanatory. Brief structured Essay should be descriptive and short answers should be direct recollection based.

2.11. Conditions under which the candidates are permitted to proceed to the next higher class

A candidate is not permitted to appear in the final year examination unless he /she clear all I, II and III year BPT subjects. A candidate can however appear for II and III BPT examinations without passing previous examinations.

2. 12. Declaration of class

Class shall we awarded at the end of each university examination as follows:-

Distinction – 75% and above

First class - 60% and above and less than 75%

Second class – 50% and above and less than 60%

A candidate passing a university examination in more than one attempt shall be placed in Pass class only irrespective of the percentage of the marks secured by him/her in the examination

2. 13. Internship

Every candidate admitted BPT degree course shall undergo six months of the compulsory internship after passing of the final year examinations. No candidate shall be awarded degree certificate without successfully completing six months of internship.

The internship should be in rotatory essentially involving posting to Physiotherapy Out patient department , Community physiotherapy.

It should also cover clinical branches concerned with physiotherapy such as Orthopaedics and sports medicine, cardiothoracic, ICU's, neurology and neuro-surgery, paediatrics, general medicine, general surgery, OBG ,Prosthetics and orthotics as per institutional facilities.

*Submission of internal works such as journal presentation, case presentation, seminars as per the institutional guidelines is mandatory.

Successful completion- the student must maintain a log book. On completion of each posting the same will have to be certified by the faculty in-charge of the posting for both attendance as well as work done. On completion of all postings, the duly completed log book will be submitted to the Principal / Head of the Institution/programme to be considered as having successfully completed the internship programme.

2.14 Award of rank

Ranks and medals shall be awarded on the basis of aggregate of the all university examinations of the particular course however a candidate who fails in one or more subject during the course shall be not eligible for the award of ranks and medals.

2. 15 Award of degree

A candidate who passes entire subjects of the course and undergone internship satisfactorily for the specific period will be eligible for the award of degree during the ensuing convocation.

2. 16 Migration and transfer

Migration and transfer will not be permitted after student has registered with the course of study with the university, this will be applicable during the period of internship also.

2.17 Qualification for Teachers and Examiners in BPT course.

The teachers and examiners should possess the qualification acquired from University / Institution recognized by K.U.H.S. The teacher should possess post graduate degree from a university recognised by KUHS. To become external/internal examiner a teacher should possess a minimum of three years of post P.G teaching experience in the concerned subject.

The following are the faculty qualifications for teaching and becoming and Examiner.

No	Subject	Qualification
01	Anatomy	M D Anatomy / M Sc Anatomy
02	Physiology	MD Physiology/Msc Physiology
03	Psychology	MA Psychology
04	Sociology	MA Sociology
05	Pathology	MD Pathology/M Pharm
06	Microbiology	M Sc Microbiology/ MD Microbiology
07	Pharmacology	M Pharm / MD Pharmacology
08	Exercise Therapy	MPT
09	Electrotherapy	MPT
10	General Medicine and general surgery	MD/ MPT
11	Physiotherapy in General Medicine & General Surgery	MPT
11	Orthopaedics	M S Orthopaedics / D. Ortho / MPT (Ortho / Sports)
12	Orthopaedics and Sports Physiotherapy	MPT (Ortho / Sports)
13	Cardio respiratory & General Physiotherapy	MPT (Cardio Resp)

14	Cardiology & respiratory	MD Cardiology / MD Pulmonology/ MS Cardio thoracic Surgery / MPT (Cardio Resp)
15	Neurology & Neuro surgery	MD Neurology / MS Neurosurgery / MPT (Neuro)
16	Physiotherapy in Community Health	MPT
17	Biomechanics	MPT
18	Rehabilitation science	MPT/ MD or DNB Physiatrist, Masters in Prosthetics and Orthotics

2.18 Question Paper setting and evaluation for all papers in BPT course should be done by concerned subject experts with 2 years post PG experience OR MPT degree holders with minimum 3 years post P.G teaching experience in the concerned subject.

SECTION -3
Subject and course content

ANATOMY

Subject Title	:	Anatomy
Duration	:	0-12 Months
Total Hours	:	240
Theory	:	150 Hrs
Practical	:	90 Hrs
Total Hours/Week	:	8 Hrs

Course Description

It is designed to provide students with the working knowledge of the structure of the human body which is an essential foundation for their clinical studies. Studies are concerned with the topographical and functional anatomy of the limb's and thorax particular attention is fade to the muscles, bones and joints of the regions. The abdomen, pelvis, perineum, head and neck and central nervous system (CNS) are

studied with particular reference to topics of importance to physiotherapists. The study of the CNS includes detailed consideration of the control of motor function.

THEORY

1. Histology [5 Hours]

General histology, study of the basic tissues of the body;

Microscope, Cell, Classification of epithelial & connective tissues, Cartilage, Bone, Muscular Tissue-TS & LS, Circulatory system-Large sized artery, medium sized artery, large sized vein, Nervous tissues, Skin and its appendages.

2. Embryology [5 Hours]

- a) Ovum, Spermatozoa fertilization and formation of the Germ layers and their derivations (brief outline).
- b) Development of bones, axial and appendicular skeleton and muscles,
- c) Neural tube and spinal cord,
- d) Development of brain and brain stem structures.

3. Regional Anatomy

Thorax: [15 Hours]

a. Cardio-vascular System

Mediastinum: Divisions and contents

Pericardium : Thoracic Wall: position, shape and parts of the heart; conducting System; blood Supply and nerve supply of the heart; names of the blood vessels and their distribution in the body- region wise.

b. Respiratory system

Outline of respiratory passages

Pleura and lungs: position, parts relations, blood supply and nerve supply;

Lungs- emphasize on broncho-pulmonary segments.

Diaphragm: Origin, insertion, nerve supply and action, openings in the diaphragm.

Intercostals muscles and Accessory muscles of respiration: Origin, insertion, nerve supply and action.

Abdomen [5 Hours]

- c. Peritoneum: Parietal peritoneum, visceral peritoneum, folds of peritoneum, functions of peritoneum.
- d. Large blood vessels of the gut

- e. Location, size, shape, features, blood supply, nerve supply and functions of the following: stomach, liver, spleen, pancreas, kidney, urinary bladder, intestines, gall bladder.

Pelvis: [5 Hours]

- f. Position, shape, size, features, blood supply and nerve supply of the male and female reproductive system. Pelvic girdle (joints) and muscles at the pelvic floor, Comparison of female and male pelvis.

Endocrine glands (Brief outline): [5 Hours]

- g. Position, shape size function blood supply and nerve supply of the following glands: Hypothalamus and pituitary gland, thyroid glands, parathyroid glands, Adrenal glands, pancreatic islets, ovaries and testes, pineal glands, thymus.

4. Musculo Skeletal Anatomy-(All the topics to be taught in detail) [16 Hours]

- a) Anatomical positions of body, axes, planes, common anatomical terminologies (Groove, tuberosity, trochanters etc)
- c) Bones Composition & functions, classification and types according to morphology and development.
- d) Joints-definition-classification, structure of fibrous, cartilaginous joints, synorrial joints blood supply and nerve supply of joints.
- e) Muscles - origin, insertion, nerve supply and actions.
- f) Applied clinical anatomy related to the above topics.

5. Upper Extremity: [30 Hours]

- a. Osteology : Clavicles, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges. Ossification of individual bones.
- b. Soft parts: Breast, pectoral region, axilla, front of arm, back of arm, cubital fossa, front of fore arm, back of fore arm, palm, dorsum of hand, muscles, nerves, blood vessels and lymphatic drainage of upper extremity.
- c. Joints : Shoulder girdle, shoulder joint, elbow joints, radio ulnar joint, wrist joint and joints of the hand.
- d. Superficial & Deep palmer arches of hand, skin of the palm and dorsum of hand.
- e. Applied/Clinical anatomy related to the above topics.

6. Lower Extremity: [30 Hours]

- a. Osteology : Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals and phalanges.
Ossification of individual bones.
- b. Soft parts: Gluteal region, front and back of the thigh (Femoral triangle, femoral canal and inguinal canal), medial side of the thigh (Adductor canal), lateral side of the thigh, popliteal fossa, anterior and posterior, compartment of leg, sole of the foot, lymphatic drainage of lower limb, venous drainage of the lower limb, arterial supply of the lower limb, arches of foot, skin of foot.
- c. Joints: Hip Joint, Knee joint, Ankle joint, joints of the foot.
- d. Applied/Clinical anatomy related to the above topics.

7. Head, Neck and Spine [16 Hours]

- a. Osteology : Mandible and bones of the skull, paranasal sinuses (Brief outline)
- b. Soft parts : Muscles of the face and neck and their nerve and blood supply-extra ocular muscles, triangles of the neck,
- c. Gross anatomy of eyeball, nose, ears and tongue (Brief outline).
- d. Spine. – Structure and function, Lumbo Pelvic Rhythm
 - a. Osteology: Cervical, thoracic, lumbar, sacral and coccygeal vertebrae and ribs
 - b. Soft tissue: Pre and Para vertebral muscles, intercostals muscles, anterior abdominal wall muscles, Inter-vertebral disc & joints.
- e. Applied/ Clinical related to Anatomy above topics.

8. Neuro Anatomy [18 Hours]

- a. Organization of Central Nervous system -Spinal nerves and autonomic nervous system mainly pertaining to cardiovascular, respiratory and urogenital system
- b. Cranial nerves
- c. Peripheral nervous system
 1. Peripheral nerves
 2. Neuromuscular junction
 3. Sensory end organs
- d) Central Nervous System
 1. Spinal segments and areas
 2. Brain Stem
 3. Cerebellum
 4. Inferior colliculi

- e. Superior Colliculi
- f. Thalamus
- g. Hypothalamus
- h. Corpus striatum
- i. Cerebral hemisphere
- j. Lateral ventricles
- k. Blood supply to brain
- l. Basal Ganglia
- m. The pyramidal system
- n. Pons, medulla, extra pyramidal systems
- o. Anatomical integration.
- p. Applied /Clinical Anatomy related to the above topics.

PRACTICAL [90 Hours]

List of Practical / Demonstrations *

Topics – With Emphasis on Structure and Function of Joints, Muscles and on Human body as a Kinematic chain.

- 1. Upper extremity Anatomy
- 2. Lower extremity Anatomy
- 3. Head & Spinal cord and Neck and Brain including surface Anatomy
- 4. Thorax including surface anatomy, abdominal muscles joints Diaphragm
- 5. Embryology- Histology-Elementary tissue including surface Anatomy
- 6. a. Demonstration of the muscles of the whole body and organs in Thorax and Abdomen in a cadaver
- b. Demonstration of movements & discuss about the range of motion (ROM) in important joints.
- c. Surface making of the lung, pleura, fissures and lobes of lungs, heart, liver, spleen,
- d. Kidney, cranial nerves, spinal nerves and important blood vessels.
- e. Identification of body prominences on inspection and by palpation especially of extremities.
- f. Points of palpation of Muscles, bones, Joints, nerves and arteries.

Recommended Text books:

1. SNELL [Richard S], Clinical Anatomy for Medical students : Ed. 5. Little Brown and Company Boston. 1995,
2. B.D CHAURASIA'S HUMAN ANATOMY -REGIONAL AND APPLIED; VOLUME 1, VOLUME II AND VOLUME III.
3. MOORE [Keith L], Clinically Oriented Anatomy. Ed. 3., Williams and Wilkins, Baltimore, 1992
4. DATTA [A.K], Essentials of human Anatomy: Thorax and Abdomen Ed 2. Vol. I Current. Book International, Calcutta 1994
DATTA..K.J, Essentials of human Anatomy: Head and Neck Ed 2. Vol. II, Current Book International, Calcutta 1995
5. SINGH [Inderbir], Text book of anatomy with color atlas: Introduction, Osteology, upper extremity, lower extremity. Vol I. P Brothers, New Delhi 1996
6. SINGH [Inderbir], Text book of anatomy with colour atlas: Thorax and abdomen. Vol II. JP Brothers, New Delhi 1996
7. SINGH [Inderbir], Text book of anatomy with color atlas: Head and Neck Central Nervous system. Vol III. JP Brothers, New Delhi 1996
8. SINGH [Inderbir], Human Osteology. JP Brothers, New Delhi 1990
10. Drake, Vogl & Mitinell, YRAY'S Anatomy for students, 2nd Edition, 2010 Church II Livingstone.
- 11 SNELL, Clinical Anatomy, 7th edition 2004 Lippincott, Williams & Wilkins.

PHYSIOLOGY

Subject Title	:	PHYSIOLOGY
Duration	:	0- 12 Months
Total Hours	:	240
Theory	:	150Hrs
Practical	:	90 Hrs
Total Hours / Week	:	8 Hrs

Course Description

The course in Physiology over the first year is designed to provide an understanding of the physiology of human body, with the ultimate aim to have a firm knowledge of physiological reactions to Exercise and Physical activity.

The major topics covered include the following: Basic Physiology of the Nervous Cardiovascular Respiratory Digestive Excretory Reproductive and Endocrine system with focus on the effects of various exercises and physical activities.

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

THEORY

General Physiology [3 Hrs]

- Cell: Morphology. Organelles: their structure and functions
- Transport Mechanisms across the cell membrane
- Body fluids: Distribution, composition. Tissue fluid - formation.

Blood [10 Hrs]

Introduction : Composition and functions of blood.

Plasma : Composition, formation, functions. Plasma proteins.

RBC : Count and its variations. Erythropoiesis-stages, factors regulating. Reticulo-endothelial system (in brief) Hemoglobin - Anaemia (in detail), types of Jaundice. Blood indices, PCV, ESR.

- WBC: Classification. Morphology, functions, count, its variation of each. Immunity
- Platelets: Morphology, functions, count, its variations
- Haemostatic mechanisms: Blood coagulation-factors, mechanisms. Their disorders. Anticoagulants.
- Blood Groups: Landsteiner's law. Types, significance, determination, Erythroblastosis foetalis.
- Blood Transfusion: Cross matching. Indications and complications.
- Lymph: Composition, formation, circulation and functions.

Nerve Muscle Physiology [25 Hrs]

- Introduction: Resting membrane potential. Action potential - ionic basis and properties.
- Nerve: Structure and functions of neurons. Classification, Properties and impulse transmission of nerve fibres. Nerve injury -degeneration and regeneration.
- Neuroglia: Types and functions.

- Muscle: Classification. Skeletal muscle: Structure. Neuromuscular junction : Structure. Neuromuscular transmission, myasthenia gravis. Excitation- Contraction coupling. Rigormortis. Motor unit. Properties of skeletal muscles, Strength- Duration curve, Length-tension relationship, fatigue, load.
- Smooth muscle: Structure, types, mechanism of contraction. Plasticity.

Cardiovascular System [15 Hrs]

- Introduction: Physiological anatomy and nerve supply of the heart and blood vessels. Organization of CVS. Cardiac muscles: Structure. Ionic basis of action potential and pacemaker potential. Properties.
- Conducting system: Components. Impulse conduction, Cardiac Cycle: Definition. Phases of cardiac cycle. Pressure and volume curves. Heart sounds - causes, character. ECG: Definition. Different types of leads. Waves and their causes. P-R interval. Heart block.
- Cardiac Output: Definition. Normal value. Determinants. Stroke volume and its regulation. Heart rate and its regulation. Their variations
- Arterial Blood Pressure: Definition. Normal values and its variations. Determinants. Regulation of BP.
- Arterial pulse.
- Shock - Definition. Classification-causes and features
- Regional Circulation: Coronary, Cerebral and Cutaneous circulation..

Respiratory System [15Hrs]

- Introduction: Physiological anatomy - Pleura, tracheo-bronchial tree, alveolus, respiratory membrane and their nerve supply. Functions of respiratory system. Respiratory muscles.
- Mechanics of breathing: Intrapleural and Intrapulmonary pressure changes during respiration. Chest expansion. Lung compliance: Normal value, pressure-volume curve, factors affecting compliance and its variations. Surfactant - Composition, production, functions. RDS
- Spirometry: Lung volumes and capacities. Timed vital capacity and its clinical significance. Maximum ventilation volume. Respiratory minute volume.
- Dead Space: Types and their definition.
- Pulmonary Circulation. Ventilation-perfusion ratio and its importance.
- Transport of respiratory gases: Diffusion across the respiratory membrane. Oxygen transport -Different forms, oxygen-hemoglobin dissociation curve.

Factors affecting it. P50, Haldane and Bohr effect. Carbon dioxide transport: Different forms, chloride shift.

- Regulation of Respiration: Neural Regulation. Hering-breuer's reflex. Voluntary control. Chemical Regulation.
- Hypoxia: Effects of hypoxia. Types of hypoxia, Hyperbaric oxygen therapy. Acclimatization Hypercapnoea. Asphyxia. Cyanosis - types and features. Dysbarism
- Disorders of Respiration: Dyspnoea. Orthopnoea. Hyperpnoea, hyperventilation, apnoea, tachypnoea. periodic breathing - types
- Artificial respiration

Digestive System [10 Hrs]

- Introduction: Physiological anatomy and nerve supply of alimentary canal. Enteric nervous system
- Salivary Secretion: Saliva: Composition. Functions. Regulation. Mastication (in brief)
- Swallowing : Definition Different stages, Functions.
- Stomach: Function, Gastric Juice: Gland, composition, function, regulation. Gastrin:

PRODUCTION, FUNCTION AND REGULATION. Peptic ulcer, Gastric motility. Gastric emptying. Vomiting.
- Pancreatic Secretion: Composition, production, function..
- Liver: Function of liver. Bile secretion: Composition, functions and regulation. Gall bladder: Functions.
- Intestine: Succus entericus: Composition, function of secretion. Intestinal motility and its function and regulation.
- Mechanism of Defaecation.

Renal System [10 Hrs]

- Introduction: Physiological anatomy, Nephrons – cortical, and juxtamedullary. Juxta glomerular apparatus. Glomerular membrane. Renal blood flow and its regulation. Functions of kidneys.
- Mechanism of urine Formation: Glomerular Filtration: GFR – normal value and factors affecting.. Renal clearance. Insulin clearance..

- Tubular Reabsorption: Reabsorption of Na^+ , glucose,, HCO_3^- . Urea and water. Filtered load
Renal tubular transport maximum. Glucose clearance. .Renal threshold for glucose.
- Tubular Secretion: Secretion of, H^+ and K^+ , PAH Clearance.
- Micturition: Mechanism of micturition. . Atonic bladder, automatic bladder.
- Acid – Base balance (very brief)
- Skin and temperature regulation.

Endocrine System [10 Hrs] (Emphasis on regulation and functions only)

- Introduction: Major endocrine glands. Hormone: classification, mechanism of action. Functions of hormones.
- Pituitary Gland: Anterior Pituitary and Posterior pituitary hormones: Secretory cells, action on target cells, regulation of secretion of each hormone.
Disorders: Gigantism, Acromegaly, Dwarfism,
- Diabetes Insipidus. Physiology of growth and development: hormonal and other influences.
- Thyroid Gland: Thyroid hormone and calcitonin: secretory cells, synthesis, storage, action and regulation of secretion. Disorders: Myxoedema, Cretinism, Grave's disease.
- Parathyroid hormones: secretory cells, action, regulation of secretion: Disorders: Hyperparathyroidism.
- Adrenal Gland: Adrenal Cortex: Secretory cells, synthesis, action, regulation of secretion of Aldosterone, Cortisol,. Disorders:: Addison's disease, Cushing's syndrome, Conn's syndrome, Adrenogenital syndrome. Adrenal Medulla: Secretory cells, action. Disorders: Pheochromocytoma.
- Endocrine Pancreas: Secretory cells, action,. Regulation of secretion of insulin and glucose, Glucose metabolism and its regulation. Disorder: Diabetes mellitus.

Reproductive System [10 Hrs]

- Introduction: Physiological anatomy reproductive organs. Sex determination. Sex differentiation. Disorder
- Male Reproductive System: Functions of testis. Pubertal changes in males. Spermatogenesis.
- Testosterone: action.
- Female Reproductive System: Functions of ovaries and uterus. Pubertal changes in females.

Oogenesis. Hormones: estrogen and progesterone-action.. Menstrual Cycle. Hormonal, basis. Menarche. Menopause. Pregnancy: Pregnancy tests. Physiological changes during pregnancy. Functions of placenta. Lactation. Contraception methods.

Special Senses [7 Hrs]

- Vision: Introduction: Functional anatomy of eye ball. Functions of cornea, iris, pupil, aqueous humor- glaucoma, lens- cataract, vitreous humor, rods and cones. Photopic vision. Scotopic vision.
- Visual pathway and the effects of lesions
- Refractive Errors: Myopia, Hypermetropia, presbyopia and astigmatism.
- Visual Reflexes. Accommodation, papillary and light. Visual acuity and Visual field. Light adaptation. Dark adaptation. Color vision –color blindness. Nyctalopia.
- Audition: Physiological anatomy of the ear. Functions of external ear, middle ear and inner ear Structure of Cochlea and organ of corti. Auditory pathway. Types of Deafness. Tests for, hearing. Audiometry.
- Taste: Taste buds. Primary tastes. Gustatory pathway.
- Smell: Olfactory membrane. Olfactory pathway.
- Vestibular Apparatus: Crista Ampullaris and macula. Functions and its Disorders.

Nervous System [25 Hrs]

- Introduction: Organization of CNS - central and peripheral nervous system. Functions of nervous system. Synapse: Functional anatomy, classification, Synaptic transmission. Properties.
- Sensory Mechanism: Sensory receptors: function, classification and properties. Sensory pathway: The ascending tracts — Posterior column tracts, lateral spinothalamic tract and the anterior spinothalamic tract - their origin, course, termination and functions. The trigeminal pathway. Sensory cortex. Somatic sensations: crude touch, fine touch, tactile localization, tactile discrimination, stereognosis, vibration sense, kinesthetic sensations. Pain sensation: mechanism of pain. Cutaneous pain -slow and fast pain, hyperalgesia. Deep pain. Visceral pain - referred pain. Gate control theory of pain, tabes dorsalis, sensory ataxia.
- Motor Mechanism: Motor Cortex. Motor pathway: The descending tracts - pyramidal tracts, extrapyramidal tracts - origin, course, termination and functions. Upper motor neuron and lower motor neuron. Paralysis, monoplegia, paraplegia, hemiplegia and quadriplegia.

- Reflex Action: components, Bell-Magendie law, classification and Properties.
Monosynaptic and polysynaptic reflexes, superficial reflexes, deep reflexes. Stretch reflex structure of muscle spindle, pathway, higher control and functions. Inverse stretch reflex. Muscle tone - definition, and properties hypotonia, atonia and hypertonia. UMN and LMN
- Spinal cord Lesions: Complete transection and Hemisection of the spinal cord.
- Cerebellum: Functions. Cerebellar ataxia.
- Posture and Equilibrium: Postural reflexes -spinal, medullary, midbrain and cerebral reflexes.
- Thalamus and Hypothalamus: Nuclei. Functions. Thalamic syndrome .
- Reticular Formation and Limbic System: Components and Functions.
- Basal Ganglia: Structures included and functions. Parkinson's disease.
- Cerebral Cortex: Lobes. Brodmann's areas and their functions. Higher functions of cerebral cortex - learning, memory and speech.
- EEG : Waves and features. Sleep: REM and NREM sleep.
- CSF: Formation, composition, circulation and functions. Lumbar puncture and its significance. Blood brain barrier. Hydrocephalus.
- ANS: Features and actions of parasympathetic and sympathetic nervous system.

Physiology of Exercise [25 Hrs]

- A. Effects of exercise and physical activities on
 - 1) O₂ transport
 - 2) Muscle strength/power/endurance
 - 3) B.M.R./R.Q.
 - 4) Hormonal and metabolic effect
 - 5) Cardiovascular system
 - 6) Respiratory system
 - 7) Body fluids and electrolyte
- B. Effect of gravity / altitude /acceleration / pressure on physical parameters
- C. Energy expenditure and fatigue
- D. Body Composition
- E. Physical Activity for Health and Fitness
- F. Physiology of Exercise in various age groups and diseases
- D. Criteria for prescription of exercises

Applied Physiology [5 Hrs]

More detailed study of the physiology and practical applications of the following selected topics with emphasis on aspects, which should help in understanding the nature and treatment of common clinical situations of interest in Physiotherapy.

a. Pulmonary Functions

1. Properties of gases, Mechanics of respiration, Diffusion capacity, special features of pulmonary circulation and their application.
2. Respiratory adjustments in exercises.
3. Artificial respiration
4. Breath sounds.

b. Cardio vascular Functions

1. Blood flow through arteries,, , arterioles, capillaries, veins and venuoles.
2. Circulation of Lymph, Oedema
3. Factors affecting cardiac Output
4. Circulatory adjustment in exercise and in postural and gravitational changes,
5. Patho physiology of fainting and heart failure.

c. Muscles and Nervous System Functions

1. Peripheral nervous system, Neuromuscular transmission, Types of nerve fibres.
2. Action potential, Strength-duration curve, ECG, EMG, VEP, NCV
3. Degeneration and regeneration of nerve, Reactions of denervations.
4. Synaptic transmission, Stretch reflex-Mechanism and factors affecting it.
5. Posture, Balance and Equilibrium/Coordination of voluntary movement
6. Voluntary motor action, clonus, Rigidity, Discordination,
7. Special senses- Vision, taste, hearing, vestibular, Olfaction
8. Sympathetic and Parasympathetic regulation, Thermoregulation.

d. Blood functions

1. Thalassemia Syndrome, Hemophilia, VWF

2. Anemia, Leucocytosis
3. Bone marrow transplant

e. Metabolic Functions

Diabetes Mellitus, Physiological basis of Peptic Ulcer, Jaundice, GIT disorders and Dietary fiber, Thyroid functions, Vitamins deficiency.

PRACTICAL 60 Hrs

I. Haematology 15 Hrs

To be done by the students

1. Study of Microscope and its uses
2. Determination of blood groups
3. Determination of bleeding time
4. Determination of clotting time

Demonstrations only

1. Determination of ESR
2. Determination of PC V

II. Clinical Examination 35 Hrs

To be done by the students

1. Examination of Radial pulse.
2. Recording of blood pressure
3. Examination of CVS
4. Examination of Respiratory system
5. Examination of sensory system
6. Examination of Motor System
7. Examination of reflexes

III. Demonstrations 10 Hours

1. Spirometry, Body Composition, Exercise testing.
2. Ergometry, Artificial Respiration
3. ECG, EEG

Recommended text books:

1. Text book of medical physiology - Guyton Arthur
2. Concise medical physiology - Chaudhuri Sujit K.
3. Human Physiology — Chatterjee C. C.
4. Text book of practical Physiology - Ranade.
5. Text of Physiology-A.K.Jain.
6. Basics of Medical histology- Venkatesh D & SudhakarHH
7. Manipal Manual of Physiology - Prof. C N Chandrashekar

Reference:

1. Review of Medical Physiology - Ganong William F.
2. Physiological basis of Medical practice - Best & Taylor

BIOMECHANICS

Syllabus BPT II Year

Title	: Biomechanics
Duration	: 13-24 Months
Total Hours	: 200Hrs
Theory	: 150 Hrs
Practical	: 50 Hrs
Total Hours/week	: 6.5

Course Description

Kinesiology and Biomechanics involves the study of basic concepts of human movement, and application of various biomechanical principles in the evaluation diagnosis and treatment of movement and structural disorders of musculoskeletal system. Students are taught to understand the various quantitative and qualitative methods of evaluation of movement. Mechanical principles of various treatment methods are studied. Study and management of deviations in posture, ADL and gait are also an integral part.

THEORY***1. Basic Concepts in Biomechanics: Kinematics and Kinetics [25Hrs]***

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

2. Joint structure and Function [13 Hrs]

- a) Joint design
- b) Materials used in human joints
- c) General properties of connective tissues
- d) Human joint design
- e) Joint function
- f) Joint motion
- g) General effects of disease, injury and immobilization.

3. Muscle structure and function [12 Hrs]

- a) Mobility and stability functions of muscles
- b) Elements of muscle structure

- c) Muscle function
- d) Effects of immobilization, injury and aging

4. Biomechanics of the Thorax and Chest wall [10 Hrs]

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

5. The Temporomandibular Joint [5 Hrs]

- a) General features, structure, function and dysfunction

6. Biomechanics and kinesiology of the vertebral column [15Hrs]

- a) General structure and function
- b) Regional structure and function – Cervical region, thoracic region, lumbar region, sacral region
- c) Muscles of the vertebral column
- d) General effects of injury and aging

7. Biomechanics and kinesiology of the peripheral joints [45 Hrs]

- a) The shoulder complex: Structure and components of the shoulder complex and their integrated function.
- b) The elbow complex: Structure and function of the elbow joint – humeroulnar and humeroradial articulations, superior and inferior radioulnar joints; mobility and stability of the elbow complex; the effects of immobilization and injury.
- c) The wrist and hand complex: Structural components and functions of the wrist complex; structure of the hand complex; prehension; functional position of the the wrist and hand.

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

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

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

8. Biomechanics and kinesiology of Posture, ADL and Gait [25 Hrs]

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

PRACTICAL: [50 Hrs]

Shall be conducted for various joint movements and analysis of the same. Demonstration may also be given as how to analyze posture and gait. The student shall be taught and demonstrated to analysis for activities of daily living – ADL – (like sitting to standing, throwing, lifting etc.) The student should be able to explain and demonstrate the movements occurring at the joints, the muscles involved, the movements or muscle action produced, and mention the axis and planes through which the movements occur. The demonstrations may be done on models or skeleton.

Recommended Text books:

1. *Joint Structure and Function – A comprehensive Analysis, JP Bros Medical Publishers, New Delhi.*

2. *Brunnstrom, Clinical Kinesiology, JP Bros Medical Publishers, Bangalore, 5th Ed 1996, 1st Indian Ed 1998*

3. *Clinical Kinesiology for Physical Therapist Assistants, JP Bros Medical Publishers, Bangalore, 1st Indian Ed 1997*

4. *Textbook on kinesiology by D.A. Neuman*

PSYCHOLOGY & SOCIOLOGY

Subject Title	: PSYCHOLOGY&SOCIOLOGY
Duration	: 0-12 Months
Total Hours	: 180
Theory	: 90/90
Total Hours/week	: 3+3Hrs

Course description

Human Psychology involves the study of various behavioural patterns of individuals, theories of development, normal and abnormal aspects of motor, social, emotional and language development, communication and interaction skills appropriate to various age groups. Sociology will introduce student to the basic sociology concepts, principles and social , emotional and language development, communication and interaction skills appropriate to various age groups. Sociology will introduce student to the basic sociology concepts, principles and social process social institutions [in relation to the individual, family and community] and the various social factors affecting the family in rural and urban communities in India will be studied.

The study of these subjects will help the student to understand their clients while assessment and while planning appropriate treatment method.

Theory (Psychology)

1. Introduction to Psychology [10 Hrs]

a. Schools : Structuralism, functionalism, behaviorism, psychoanalysis.

- b. Methods : Introspection, observation, inventory and experimental method.
- c. Branches : Pure psychology and applied psychology
- d. Psychology and physiotherapy

2. Growth and Development [5 Hrs]

- a. Life span : different stages of development (Infancy, childhood, adolescence, adulthood, middle age, old age).
- b. Heredity and environment: role of heredity and environment in physical and psychological development, “Nature v/s Nature controversy”

3. Sensation, attention and perception [10 Hrs]

- a. Sensation : Vision, Hearing, Olfactory, Gustatory and Coetaneous sensation, movement, equilibrium and visceral sense.
- b. Attention :Types of attention, Determinants and objective determinants
- c. Perception: Gestalt principles of organization of perception (principle of figure ground and principles of grouping), factors influencing perception (past experience and context)
- d. Illusion and hallucination: different types

4. Motivation [5 Hrs]

- a. Motivation cycle (need, drive, incentive, reward).
- b. Classification of motives.
- c. Abraham Maslow’s theory of need hierarchy

5. Frustration and conflict [5 Hrs]

- a. Frustration : Sources of frustration.
- b. Conflict : types of conflict.
- c. Management of frustration and conflict.

6. Emotions [5 Hrs]

- a. Three levels of analysis of emotion (physiological level, subjective state, and overt behavior).

- b. Theories of emotion
- c. Stress and management of stress.

7. Intelligence [10 Hrs]

- a. Theories of intelligence.
- b. Distribution of intelligence.
- c. Assessment of intelligence.

8. Thinking [10 Hrs]

- a. Reasoning : deductive and inductive reasoning
- b. Problem solving : rules in problem solving (algorithm and heuristic)
- c. Creative thinking : steps in creative thinking, traits of creative people

9. Learning [10 Hrs]

- a. Factors effecting learning.
- b. Theories of learning : trial and error learning, classical conditioning, Operant conditioning, insight learning, social learning theory.
- c. The effective ways to learn: Massed/Spaced, Whole/Part, Recitation/Reading, Serial/ Free recall, Incidental/Intentional learning, Knowledge of results, association, organization, and mnemonic methods.

10. Personality [10 Hrs]

- a. Approaches to personality: type & trait, behavioristic, psychoanalytic and humanistic approach.
- b. Personality assessment: observation, situational test, questionnaire, rating scale, interview, and projective techniques.
- c. Defense Mechanisms: denial of reality, rationalization, projection, reaction formation, identification, repression, regression, intellectualization, undoing, introjections, acting out.

11. Social psychology [10 Hrs]

- a. Leadership: Different types of leaders. Different theoretical approaches to leadership.
- b. Attitude: development of attitude. Change of attitude

Recommended text books:

1. Feldman, R.H (1996). Understanding psychology. New Delhi: Tata McGraw hill.
2. Morgan et al (2003). Introduction to psychology. New Delhi: Tata McGraw hill.
3. Lefton Psychology. Boston: Alwin & Bacot Company.
4. Mongol, S.K (2002). Advanced educational psychology. New Delhi: prentice hall.
5. Atkinson (1996). Dictionary of psychology.

THEORY (SOCIOLOGY)**1. Introduction: [10 Hrs]**

1. Meaning- Definition and scope of sociology
2. Its relation to Anthropology, Psychology, Social Psychology.
3. Methods of Sociological investigations- Case study, social survey, questionnaire, Interview and opinion poll methods.
4. Importance of its study with special reference to Health Care Professionals.

2. Social Factors in Health and disease situations: [5 Hrs]

1. Meaning of social factors
2. Role of social factors in health and illness

3. Socialization: [5 Hrs]

1. Meaning and nature of socialization
2. Primary, Secondary and Anticipatory socialization
3. Agencies of socialization

4. Social Groups: [5 Hrs]

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

5. Family: [10 Hrs]

1. The family, meaning and definitions.
2. Functions of types of family
3. Changing family patterns
4. Influence of family on the individuals health, family and nutrition, the effects of sickness in the family and psychosomatic disease and their importance to physiotherapy.

6. Community: [5 Hrs]

1. Rural community: Meaning and features -Health hazards of ruralities, health hazards to tribal community.
2. Urban community: Meaning and features-Health hazards of urbanities.

7. Culture and Health: [10 Hrs]

1. Concept of Health
2. Concept of Culture
3. Culture and Health.
4. Culture and Health Disorders

8. Social Change : [10 Hrs]

1. Meaning of social changes.
2. Factors of social changes.
3. Human adaptation and social change

4. Social change and stress.
5. Social change and deviance.
6. Social change and health programme
7. The role of social planning in the improvement of health and rehabilitation.

9. Social Problems of disabled: [15 Hrs]

Consequences of the following social problems in relation to sickness and disability, remedies to prevent these problems.

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

10. Social Security : [5 Hrs]

Social security and social legislations in relation to the disabled.

11. Social worker: [10Hrs]

1. Meaning of Social Work
2. The role of a Medical Social Worker

Recommended Text Books

1. Sachdeva and Vidyabushan, Introduction to the study of sociology
2. INDRANI T K, Text Books of Sociology for Graduates Nurses and Physiotherapy Students, JP Brothers, New Delhi, 10

Course Description

At the completion of this course the student of First Aid and CPR must be able to identify and manage situation of common emergencies.

Subject Title	:	First Aid & Nursing
Duration	:	0-12 Months
Total Hours	:	60
Theory	:	30Hours
Practical	:	30 Hours
Total Hours/week	:	2 Hours

THEORY (FIRST AID) [20 Hrs]

1. Importance of First Aid in Physiotherapy,
2. Examination of Vital Signs.
3. First Aid in cardiac arrest.
4. First Aid in Respiratory failure.
5. First Aid in Burns.
6. First Aid in Electric shock.
7. First Aid in Drowning.
8. First Aid in Spinal cord injuries.
9. First Aid in Hypovolemic Shock.
10. First Aid in Poisoning
11. Instrumentation used in First Aid (First Aid kit).
12. First Aid in RTA.
13. Indication of CPR.
14. Assessment and technique of CPR.
15. Artificial ventilation.

THEORY (NURSING) [10 Hrs]

1. What is Nursing ? Nursing principles. Inter-Personnel relationships. Bandaging :
Basic turns; Bandaging extremities; Triangular Bandages and their application.

2. Nursing Position: Environment safety; Bed making, prone, lateral, dorsal, dorsal recumbent, Flower's positions, comfort measures, Aids and rest and sleep,
3. Lifting and Transporting Patients : Lifting Patients up in the bed. Transferring from bed to wheel chair. "Transferring from bed to stretcher".
4. Bed side Management : Giving and taking Bed pan, Urinal : Observation of stools, urine. Observation of sputum, Understand use and care of catheters, enema giving.
5. Methods of Giving Nourishment: Feeding, Tube feeding, drips, transfusion
6. Care of Rubber Goods: Observation, Reporting and Recording Temperature, Respiration and Pulse, Simple aseptic Technique, Sterilization and Disinfection.
7. Surgical Dressing : Observation of dressing
8. Procedures

Recommended Textbooks

1. First aid in emergency - St-john. Ambulance Association.
2. Physiotherapy for burns & Reconstruction -Glassey.
3. Surgical & Medical Procedures for Nurses & Paramedical staff- Nathan.
4. First aid & management of general injuries & common ailments-Gupta & Gupta

ORIENTATION TO PHYSIOTHERAPY

COURSE DESCRIPTION

Subject Title	:	Orientation to Physiotherapy
Duration	:	0 - 12 Months
Total Hours	:	90
Theory	:	90 Hrs
Total Hours/week	:	2Hr

THEORY**I Patterns of Health Care Delivery:**

- a. National Trends and resources
- b. Local trends and resources
- c. Overview of Health Science Professions

II Components of Physiotherapy Profession:

- a. History of Medical Therapeutics
- b. History of Physiotherapy
- c. Overview of Health Science Professions

III Role of Physiotherapy in meeting Health Care Needs in India.

- a. Needs versus Demands of
- b. Physiotherapist as 'Educator'
- c. Typical Job settings
- d. Common problems and solutions.

Introduction of Physical Assessment, Physical Diagnosis and Differential Diagnosis

IV. Responsibility Characteristics of being a professional**BIOCHEMISTRY AND NUTRITION**

Subject	:	BIOCHEMISTRY & NUTRITION
Duration	:	0 – 12 months
Total hours	:	120
Theory	:	60 + 60
Total hours/ week	:	2.5 + 2.5 hours

Course Description

At the completion of this course the student will have a basic knowledge about the importance of Biochemistry and an understanding of Principles of Nutrition. Such that he/ she shall be able to utilize it in the practice of physiotherapy.

THEORY**BIOCHEMISTRY****Total Hours 60****1. Cell (6 hours)**

Introduction, Cell structure, Cell membrane structure & function, various types of absorption. Intracellular & their function.

2. Carbohydrates (8 hours)

Definition General Classification with examples, Sources & Functions, Digestion and absorption, metabolism of carbohydrates, with emphasis on glycolysis, gluconeogenesis, HMP shunt pathway. Inborn errors associated with carbohydrates metabolism, regulation of blood glucose level, diabetes mellitus(aetiology, biochemical abnormalities, biochemical basis of complications, lab diagnosis)

3. Lipid chemistry (6 hours)

Definition General Classification with examples, Sources & Functions, Digestion and absorption, metabolism of Lipids(fatty acid oxidation-beta and alpha oxidation,cholesterol synthesis,) Phospholipids, inborn errors, Atherosclerosis.

4. Proteins and amino acids (6 hours)

Definition General Classification with examples, & Functions, Digestion and absorption, metabolism of Proteins glycin, phenylalanine,tyrosine,,Aminoacidurias

5. Integration of metabolism and ETC(2 hours)**6. Vitamins (4 hours)**

Definition, classification according to solubility, Major Individual vitamins – sources digestion, absorption, deficiency.

7. Mineral metabolism (3 hours)

Definition, Digestion, absorption, function. Examples of Disorders of individual Minerals Iron Copper.

8. Water and Electrolyte Balance (6 hour)

Water distribution in the body, Body water, water turn over, Regulation of water balance, Distribution of electrolytes Electrolyte balance, Acid-base balance

9. Nucleotide ,nucleic acid chemistry: Nucleotide chemistry, nucleotide composition and function of free nucleotides in the body, nucleic acid(DNA and RNA)chemistry, difference between DNA and RNA,structure of DNA ,function of RNA,structure and function of RNA.(2 hours)

10. Clinical Bio chemistry (6 hours)

Normal level of blood & urine constituents, Relevance of blood & urine level of glucose, , Renal and Liver function tests

10.Detoxification(2 hours)

11.Enzymes:Definition ,classification,factors affecting enzyme activity, diagnostic enzymology(2 hours)

12.Hormones:Definition,classification,mechanism of action(2 hours).

13. Procedures in Bio chemistry (3 hours)

Electrophoresis Chromatography, RIA ,ELISA

14. Radioactivity (2 hours)

Diagnostics, Research & therapeutic applications Radiation hazards

NUTRITION

Subject	:	Nutrition
Duration	:	0 – 12 months
Theory	:	60
Total hours/ week	:	2.5 hours

1. Introduction to nutrition, Role of nutrition in maintaining health. Nutritional problems in India. Factors affecting food and nutrition: socio - economic,

cultural, tradition, production, system of distribution, life style and food habits etc. **(10 Hrs)**

2. Classification of foods. Food standards. Elements of nutrition: macro and micro.

Energy, Unit of Energy – Kcal. Energy requirements of different categories of people.

Measurements of energy. Body Mass Index (BMI). Basal Metabolic Rate (BMR) –

determination and factors affecting. Respiratory Quotient (RQ), Specific Dynamic Action

(SDA). **(5 hrs)**

3. Carbohydrates : Caloric Value, Recommended daily allowances. Dietary sources. Functions. Malnutrition: Deficiencies and Over consumption.**(5 hrs)**

4. Fats: Caloric Value, Recommended daily allowance. Dietary sources, Functions. Malnutrition: Deficiencies and Over consumption.**(5 hrs)**

5. Proteins: Caloric Value, Biological Value (BV), Recommended daily allowance. Dietary sources. Functions. Malnutrition: Deficiencies and Over consumption.**(5 hrs)**

6. Vitamins: Caloric Value, Biological Value (BV), Recommended daily allowance. Dietary sources. Functions. Malnutrition: Deficiencies and Over consumption.**(5 hrs)**

7. Minerals Caloric Value, Biological Value (BV), Recommended daily allowance. Dietary sources. Functions. Malnutrition: Deficiencies and Over consumption.**(5 hrs)**

8. Balanced diet: Elements, Food groups. Recommended Daily Allowance. Nutritive value of foods. Understanding of balanced diet for different categories of people and patients Planning menu. **(5Hrs)**

9. Assessment of nutritional status- Objectives. Diet survey – objectives and methods.(5 hrs)
10. Introduction to therapeutic diets : Types of Modification in diets Diets in fever Diarrhoea Constipation Ulcers Diabetese atherosclerosis Renl Failure and Obesity (10 hrs)

Recommended books:

1. Text of Biochemistry for Medical students by Vasudevan & Sreekumari.
2. Text book of Dietetics by Sreelexmi. B
3. Harper’s Biochemistry by Robert K. Murray, Daryl K. Granner and Victor W. Rodwell.
4. Handbook of food& Nutrition, Dr. Swaminathan M. The Bangalore Printing & Publishing Co, Lts.
5. Food & Nutrition facts & figures, Gupta L C, et al. New Delhi, Jaypee.
6. Nutrition & Dietetics for Health care. Barrer M Helen.
7. Text book of Foods, Nutrition & Dietetics, Raheena Beegam.M. A .New Delhi, Sterling Publishers Pvt. Ltd.

COMUNICATIVE ENGLISH

Subject Title	:	ENGLISH
Duration	:	0 - 12 Months
Total Hours	:	60
Theory	:	60 Hrs
Total Hours/week	:	3Hr

Course description:

This course is designed to help the student acquire a good command and comprehension of the English language through individual, papers and conferences.

THEORY

Behavioral Objectives:

The student at the end of training is able to

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

Unit-I:

Introduction: [5 Hrs]

Study Techniques

Organization of effective note taking and logical processes of analysis and synthesis

The use of the dictionary Enlargement of vocabulary Effective diction

Unit - II: [5 Hrs]

Applied Grammar:

Correct usage

The structure of sentences

The structure of paragraphs

Enlargements of Vocabulary

Unit - III: [5 Hrs]

Written Composition:

Precise writing and summarizing

Writing of bibliography

Enlargement of Vocabulary

Unit – IV [5 Hrs]

Reading and comprehension

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

Enlargement of Vocabulary. .

Unit -V[5 Hrs]

The Study of Various Forms of Composition Paragraph, Essay, Letter,

Summary, Practice in writing

Unit – VI[35 Hrs]

Verbal communication:

Discussions and summarization, Debates, Speech and Oral Verbal Communication: Discussions and report making and their use in teaching.

Recommended Books

1. English Grammar Collins, Birmingham University, International Language Data Base, Rupa & Co. 1993

2. Wren and Martin - Grammar and Composition, 1989, Chanda.& Co, Delhi
3. Letters for all Occassions.A S Myers. Pub - Harper Perennial
4. Spoken English V Shasikumar and P V Dhanija_ Pub. By: Tata Mcgraw Hill, New Delhi
5. Journalism Made Simple , D Wainwright
6. Writers Basic Bookshelf Series, Writers Digest series
7. Interviewing by Joan Clayton Platkon
8. Penguin Book of Interviews.

BPT IInd YEAR

ELECTROTHERAPY

Course Description

In this course the student will learn the Principles, Techniques, Effects, Indications, Contra-indication and the dosage parameters for various electro therapeutic modalities in the restoration of physical function. The objective of this course is that after specified hours of lectures, demonstration, practical and clinics the student will be able to independently prescribe and carry out the Physiotherapy treatment using electrotherapy aids in various clinical conditions.

Subject title	ELECTROTHERAPY
Duration	13 - 24 Months
Total Hours	240
Theory	120 Hrs
Practical	120 Hrs
Total Hours/week	8 Hrs

THEORY

Section I – Introductory Physics. [10 Hrs]

1. Electricity definition, types

2. Static electricity

- a. Production of electrical charges.
- b. Characteristics of charged body.
- c. Characteristics of lines of force.
- d. Potential difference and EMG.

3. Current Electricity

- a. Units of Electricity, Faraday, volt, ampere, coulomb, watt.

- b. Resistance in series and parallel.
- c. Ohms law and its application to DC/AC.
- d. Fuse.
- e. Shock: Micro/Macro shocks, safety precaution and management, earthing techniques&precautions.
- f. Burns: electrical & chemical burns, prevention and management.
- g. Condensators: definition, principles, types construction, working and uses.
- 4.Magnetism:** Definition, properties, electromagnetic induction, electromagnetic spectrum.
- 5. Valves, transformers,** types, principles, construction and working.
- 6.Ionization:** Principles, effects of various technique of medical ionization.

Section II – Therapeutic Electricity

Section II A – Low frequency Currents [35 Hrs]

1. Basic types of current. [5 Hrs]

- a. Direct Current: types, physiological & therapeutic effects.
- b. Alternating Current

2. Types of current used in therapeutics

- Modified DC
- Faradic Current
- Galvanic Current
- Modified AC
- Sinusoidal Current
- Diadynamic Current

3. Faradic Current; Definition, Modifications, Techniques of application of individual, muscle stimulation, Physiological & Therapeutics effects of faradic Current, Precautions, Indications, & Contra indications, Dangers.

4. Galvanic Currents: Definition, Modifications, Physiological & Therapeutics effects of Galvanic Current, Indications, & Contraindications, Dangers. Effects of Interrupted galvanic current on normally innervated and denervated muscles and partially denervated muscles

5. Sinusoidal Current & diadynamic Current in Brief.

6. HVPGS - Parameters & its uses.

7. Ionization / Iontophoresis : Techniques of Application of Iontophoresis, Indications, Selection of Current, Commonly used Ions (drugs) for pain, hyperhidrosis, wound healing, calcium deposits, sclerolytic action, fungal infection, edema reduction, inflammation & plantar warts. Current Amplitude and Treatment duration iontophoresis

8. Cathodal/ Anodal galvanism.

9. Micro Current & Macro Current

10. Types of Electrical Stimulators

NMES- Construction component.

Neuro muscular diagnostic stimulator-construction component.

Components and working Principles.

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

12. Nerve Muscle Physiology: Action Potential, Resting membrane potential, Propagation of Action Potential, Motor unit. Synapse, Accommodation- Stimulation of Healthy Muscle. Stimulation of Denervated Muscle, Stimulation for Tissue Repair.

13. TENS: Define TENS, Types of TENS, Conventional TENS, Acupuncture TENS. Burst TENS, Brief & Intense TENS, Modulated TENS. Types of Electrodes & Placement of Electrodes, Dosage parameters, Physiological & Therapeutic effects, Indications & Contraindications.

14. Pain: Define Pain. Theories of Pain (Outline only), Pain Gate Control theory in detail.

Section II B - Electro-diagnosis [15hrs]

- 1. FG Test**
- 2. SD Curve:** Methods of Plotting SD Curve. Apparatus selection, Characters of Normally innervated Muscle. Characters of Partially Denervated Muscle, Characters of Completely denervated Muscle. Chronaxie & Rheobase.
- 3. Nerve conduction velocity studies**
- 4. EMG:** Construction of EMG equipment.
- 5. Bio-feed back.**

Section II C - Medium Frequency [7 Hrs]

- 1. Interferential Therapy:** Define IFT. Principle of Production of Interferential current, Static Interference System, Dynamic Interference system. Dosage Parameters for IFT, Electrode placement in IFT. Physiological & Therapeutic effects, Indications & Contraindications.
- 2. Russian Current**
- 3. Rebox type Current**

Section III - Thermo & Actinotherapy (High Frequency Currents) [35 Hrs]

- 1. Physical Principles of Thermal energy:** Specific heat, Modes of heat transfer, Effects, contraindications, precautions & adverse effects of Thermotherapy
- 2. Electro Magnetic Spectrum.**
- 3. SWD:** Define short wave, Frequency & Wavelength of SWD, Principle of Production of SWD, Circuit diagram &: Production of SWD. Methods of Heat Production by SWD treatment. Types of SWD Electrode, Placement & Spacing of Electrodes, Tuning- Testing of SWD Apparatus, Physiological & Therapeutic effects, Indications & Contraindications, Dangers, Dosage parameters.
- 4. Pulsed Electro Magnetic Energy:** Principles, Production & Parameters of PEME. Uses of PEME.
- 5. Micro Wave Diathermy:** Define Microwave, Wavelength & Frequency, Production of MW Applicators, Dosage Parameters. Physiological Therapeutic effects. Indications & Contraindications. Dangers of MWD.
- 6. Ultrasound:** Define Ultrasound. Frequency, Piezo Electric effects: Direct. Reverse, Production of US, Treatment Dosage Parameters: Continuous & Pulsed mode

Intensity. US Fields: Near Field- Far Field Half Value distance. Attenuation, Coupling Media Thermal Effects. Non-thermal effects.Principles - Application of US: Direct contact. Water bag, Water bath. Solid sterile gel pack method for wound. Uses of US, Indications & Contraindications. Dangers of Ultrasound. Phonophoresis: Define Phonophoresis, Methods of application, Commonly used drugs. Uses. Dosages of US.

7. IRR: Define IRR, wavelength & parameters Types of IR generators, Production of IR, Physiological & Therapeutic effects, Duration frequency of treatment. Indication & Contraindication,

8. UVR: Define UVR- Types of UVR, UVR generators:Types of lamps, Theraktin tunnel. Psoralen Photochemotherapy, Mechanism of action, PUVA apparatus, PUVA regimen. Physiological & Therapeutic Effects.

9. LASER: Define LASER. Types of LASER . Principles of Production. Production of LASER by various methods. Methods of application of LASER. Dosage of LASER. Physiological & Therapeutic effects of LASER. Safety precautions of LASER. Classifications of LASER. Energy density & power density.

Section IV - Superficial heating Modalities. [18 Hrs]

1. Wax Therapy: Principle of Wax Therapy application - latent Heat. Composition of Wax Bath Therapy unit Methods of application of Wax, Physiological & Therapeutic effects Indications & Contraindications. Dangers.

2.Contrast Bath: Methods of application. Therapeutic uses, Indications & Contraindications.

3.Moist Heat Therapy: Hydro collator packs - in brief, Methods of applications. Therapeutic: uses. Indications & Contraindications.

4.Cyclotherm: Principles of production. Therapeutic uses, Indications & Contraindications.

5. Fluidotherapy: Construction, Method of application. Therapeutic uses, Indications & Contraindications

6.Whirl Pool Bath: Construction Method of Application, Therapeutic Uses. Indications & Contraindications.

7. Magnetic Stimulation. Principles Therapeutic uses. Indications & contraindications.

8. Cryotherapy: Define- Cryotherapy. Principle- Latent heat of fusion. Physiological Therapeutic effects, Techniques of Applications, Indications Contraindications & Dangers. Methods of application with dosages.

PRACTICAL [120 Hrs]

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

1. Demonstrate the technique for patient evaluation - receiving the patient and positioning the patient for treatment using electrotherapy.
2. Collection of materials required for treatment using electrotherapy modalities and testing of the apparatus.
3. Demonstrate placement of electrodes; for various electrotherapy modalities
4. Electrical stimulation for the muscles supplied by the peripheral nerves
5. Faradism under Pressure for UL and LL
6. Plotting of SD curve with chronaxie and rheobase.
7. Demonstrate FG test
8. Application of Ultrasound for different regions various methods of application
9. Demonstrate treatment techniques using SWD. IRR and Microwave diathermy
10. Demonstrate treatment method using IFT for various regions
11. Calculation of dosage and technique of application of LASER
12. Technique of treatment and application of Hydrocollator packs, cryotherapy, contrast bath. Wax therapy
13. Demonstrate the treatment method using Whirl pool bath
14. Winding up procedure after any electrotherapy treatment method.
15. Demonstration of methods for basic maintenance and repair of all Electrotherapy Equipments.

Recommended Textbooks

1. *Claytons Electrotherapy by Forster Plastangs*
2. *Electrotherapy Explained by Low & Reed*
3. *Clinical Electrotherapy by Nelson*
4. *Electrotherapy Evidence based practice by Sheila Kitchen*
5. *Physical agents by Michile Cameroon*
6. *Principles of Electrotherapy by Michile Cameroon*
7. *Thermal agents by Susan Michlovitz.*
8. *Therapeutic modalities for physical therapists by William E Prentice*

EXERCISE THERAPY

Course Description

In this course, the student will learn the principles and effects of exercise as a therapeutic modality and will learn the independent prescription of exercises for restoration maintenance and enhancement of physical function among healthy individuals, among diseased and disabled, across various age groups be it individual, group or mass prescription of therapeutic and fitness exercises.

Subject Title	:	EXERCISE THERAPY
Duration	:	13-24 Months
Total hours	:	240
Theory	:	120 hrs
Practical	:	120 hrs

THEORY

1. Mechanical Principles: [3 Hrs]

Force, Mechanics of Positions – gravity, COG, LOG, base, equilibrium, fixation, stabilization. Mechanics of movement – axis, plane, speed, velocity, work, energy, power, acceleration, momentum, inertia, friction.

Simple machines, Pendulums& Elasticity – levers, pulleys, elasticity

2. Introduction to Exercise Therapy [7 Hrs]

The aims of exercise therapy

The techniques of exercise therapy

Approach to patients problems

Assessment of patients condition

Measurements of vital parameters

Starting positions- Fundamental positions & derived positions

Planning of treatment

3. Methods of testing [10 Hrs]

a) Functional tests

b) Measurement of joint range: ROM-Definition. Normal ROM for all peripheral joints & spine, Goniometer-parts, types, principles, uses measurements of ROM for all peripheral joints

c) Test for neuromuscular deficiency

- * Electrical tests
- * Manual muscle testing: introduction to MMT principles and aims. Indications and limitation. Techniques of MMT for group and individual muscles: techniques of MMT for upper limb/techniques of MMT for lower limb, techniques of MMT for spine
- * Anthropometric measurements: Muscle girth- biceps, triceps, forearm, quadriceps, calf
- * Static Power Test
- * Dynamic power test
- * Endurance test
- * Speed test

d) Test for co-ordination

e) Tests for sensations

f) Pulmonary function tests

g) Measurement of Limb Length: True limb length, apparent limb length, segmental limb length.

h) Measurement of the angle of pelvic inclination

4. Relaxation [5 Hrs]

Definitions: Muscle tone, postural tone, voluntary movement, degrees of relaxations, pathological tension in muscle, stress mechanics, types of stresses, effect of stress on the body mechanism, Indications of Relaxations, methods and techniques of relaxation- principles and uses, General, local, Jacobson's, Mitchell's. Traditional Indian methods of Meditation as per Yoga.

5. Passive movements[5 Hrs]

Causes of immobility, classification of passive movements, specific definitions related to passive movements, Principles of giving passive movements, Indications, contraindications, effects of uses, techniques of giving passive movements.

6. Active movements [13 Hrs]

Definition of strength, power and work, endurance, muscle actions.

Physiology of muscle performance: structure of skeletal muscle, chemical & mechanical events during contraction and relaxation, muscle fiber type, motor unit, force gradation.

Causes of decreased muscle performance

Physiologic adaptations to training: strength and power, endurance

Facilitation and Inhibition Techniques

Types of active movements;

Free exercise: Classification, principles, techniques, indications, contraindications, effects and uses.

Active assisted exercise: principles, techniques, indications, contraindications, effects and uses.

Assisted-resisted exercise: principles, techniques, indications, contraindications, effects and uses.

Resisted exercise: Definition, principles, indication, contra indications, precaution and techniques, effect and uses.

Graded re-education technique on different groups of muscle

Types of resisted exercise: Manual and mechanical resistance exercise, isometric exercise, Dynamic exercise: concentric and exentric dynamic exercise: constant versus variable resistance, isokinetic exercise, open-chain and closed-chain exercises. Delayed onset muscle soreness.

Breathing Exercises: definition, types, indications & contraindications

Forced Expiratory Techniques

Postural Drainage: Types, Positions, indications, contraindications, modifications & manual techniques

Specific exercise Regimens: Isotonic- de Lormes, oxford, Macqueen, circuit weight training, Isometric: BRIME (Brief Resisted Isometric Exercise), Multiple ankle isometric. Isokinetic regimens

Plyometric Exercises

7. Proprioceptive Neuromuscular Facilitation [10 Hrs]

Definitions and goals

Basic neurophysiologic principles of PNF: Muscular activity, diagonal patterns of movement: upper limb lower limb

Procedure: components of PNF

Techniques of facilitation

Mobility: contract relax, hold relax, rhythmic initiation.

Strengthening: Slow reversals, repeated contractions, timing for emphasis, rhythmic stabilization.

Stability: Alternating isometric, rhythmic stabilization.

Skill: timing for emphasis, resisted progression Endurance: slow reversals, agonist reversal

8. Suspension Therapy [5 Hrs]

Definition, principles, equipments & accessories, Indications & contraindications, Benefits of suspension therapy

Types of suspension therapy: axial, vertical, pendular. Techniques of suspension therapy for upper limb

Techniques of suspension therapy for lower limb

9. Functional Re-education [10 Hrs]

Lying to sitting: Activities on the Mat/Bed, Movement and stability at floor level; Sitting activities and gait; Lowerlimb and Upperlimb activities.

10. Aerobic Exercise [5 Hrs]

Definition and key terms; Physiological response to aerobic exercise, Examination and evaluation of aerobic capacity - Exercise Testing, Determinants of an Exercise Program. The Exercise Program, Normal and abnormal response to acute aerobic exercise, Physiological changes that occur

with training, Application of Principles of an Aerobic conditioning program for patients - types and phases of aerobic training.

11. Stretching [8 Hrs]

Definition of terms related to stretching; Tissue response towards immobilization and elongation, Determinants of stretching exercise. Effects of stretching, inhibition and relaxation procedures. Precautions and contraindications of stretching, Techniques of stretching. Facilitated stretching

12. Manual Therapy & Peripheral Joint, Soft tissue & Neural tissue Mobilization [10 Hrs]

Schools of Manual Therapy, Principles, Grades, Indications and Contraindications, Effects and Uses - Maitland, Kaltenborn, Mulligan
Biomechanical basis for mobilization, Effects of joint mobilization. Indications and contraindications, Grades of mobilization, Principles of mobilization, Techniques of mobilization for upper limb, lower limb. Precautions.

Concepts of Mckenzie exercise protocol.

Introduction to Muscle Energy Technique.

Basics of Neurodynamics, Nerve tension testing & Neural tissue Mobilization

Basics of Myofascial Release & Trigger Point Release: Indications, Contraindications, Precautions & Protocol

History and Classification of Massage Technique Principles, Indications and Contraindications Technique of Massage Manipulations

Physiological and Therapeutic Uses of Specific manipulations

13. Balance [3 Hrs]

Definition

Physiology of balance: contributions of sensory systems, processing sensory information,

generating motor output Components of balance (sensory, musculoskeletal, biomechanical)

Causes of impaired balance, Examination & evaluation of impaired balance. Activities or treating impaired balance: mode, posture, movement, Precautions & contraindications, Types Balance retraining.

14. Co-ordination Exercise [3 Hrs]

Anatomy & Physiology of cerebellum with its pathways

Definitions: Co-ordination, Inco-ordination Causes for Inco-ordination, Test for co-ordination: equilibrium test, non equilibrium test Principles of co-ordination exercise Frenkel's Exercise, Tai Chi etc progression, home exercise.

15. Posture [2 Hrs]

Definition, Active and Inactive Postures, Postural Mechanism, Patterns of Posture, Principles of reeducation: corrective methods and techniques. Patient education.

16. Walking Aids [5 Hrs]

Types, Measurements, Prescription, Training & Evaluation: Crutches, Canes, Frames

17. Hydrotherapy [5 Hrs]

Definitions, Goals and indications. Precautions and Contraindications, Properties of water. Use of special equipments, techniques. Effects and uses, merits and demerits

18. Individual and Group Exercises [1 Hrs]

Advantages and Disadvantages, Organisation of Group exercises. Recreational Activities and Sports for groups and mass gathering.

19. Introduction to Yoga [8 Hrs]

Asanas - Classification Principles methods and Techniques
Pranayamas – Classification Principles. Methods and Techniques
Meditation - Classification Principles. Methods and Techniques

PRACTICALS [120 Hrs]

The students of exercise therapy are to be trained in Practical Laboratory work for all the topics discussed in theory. The student must understand how to evaluate and apply judiciously the different methods of exercise therapy techniques on the Patients. They must be able to;

1. Demonstrate the technique of measuring using goniometry
2. Demonstrate muscle strength using the principles and technique of MMT
3. Demonstrate – Basic Asana, Pranayama and Meditation methods
4. Demonstrate the PNF techniques
5. Demonstrate exercises for training co-ordination – Frenkel's exercises
6. Demonstrate the techniques of massage manipulations
7. Demonstrate technique for functional re-education
8. Assess and train for using walking aids
9. Demonstrate mobilization of individual joint regions
10. Demonstrate to use the technique of suspension therapy for mobilizing and strengthening joints and muscles
11. Demonstrate the techniques for muscle stretching
12. Assess and evaluate posture and gait

13. Demonstrate to apply the technique of passive movements
14. Demonstrate various techniques of active movements
15. Demonstrate techniques of strengthening muscles using resisted exercises
16. Demonstrate techniques for measuring limb length and body circumference

Desirable –

Individual and group exercises in Hydrotherapy Pool.

Recommended Textbooks

1. *Therapeutic exercises by Barbara Bandi*
2. *Therapeutic exercise by Carolyn Kisner*
3. *Principles of exercise therapy by M. Dena Gardiner*
4. *Practical exercises therapy by Hollis Margaret*
5. *Therapeutic exercises by Sydney Litch*
6. *Therapeutic exercises by Hall & Brody*
7. *Therapeutic exercises by Basmajian*
8. *Physical rehabilitation by O. Sullivan*
9. *Beard's Massage: Principles and Practice of Soft Tissue Manipulation, Giovanni DeDomenico*
10. *Principles of muscle testing by Hislop*
11. *Manual Therapy "NAGS", "SNAGS", "MWMS" etc by Brian R. Mulligan*
12. *Myofascial Release Manual by Carol J. Manheim*
13. *Mobilization of Nervous System by David Butler*
14. *The Cervical and Thoracic spine Mechanical Diagnosis and Therapy by R A McKenzie*
15. *The Lumbar spine Mechanical Diagnosis and Therapy by R A McKenzie*
16. *Muscle energy techniques by Leon Chaitow*

17. *Manual mobilization of the Joints: the kaltenborn method of Joint Examination and treatment; Vol.1 – Extremities, Vol.2 – Spine: by F kaltenborn and Olaf Evjenth*

18. *Facilitated Stretching by Robert E McAtee and Jeff Charland*

Subject title	PHARMACOLOGY
Duration	13 - 24 Months
Total Hours	90
Theory	90 Hrs
Total Hours/week	3 Hrs

19. *Light on Yoga by BKS Iyengar*

20. *Muscles: Testing and Function, with Posture and Pain: by Kendall & Kendall*

PHARMACOLOGY

Course Description

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

THEORY

1. General Pharmacology [15 Hrs]

Introduction, Definition, Classification of drugs, Source of drugs, Routes of drug administration, Distribution of drugs, Metabolism and Excretion of drugs, Pharmacokinetics, pharmacodynamics, Factors modifying drug response, Adverse effects.

2. Autonomic Nervous System [10 hrs]

General considerations - The Sympathetic and Parasympathetic System, Receptors, Somatic Nervous System Cholinergic and Anti-Cholinergic drugs, Adrenergic and Adrenergic blocking drugs, Peripheral muscle relaxants.

3. Cardiovascular Pharmacology [14 Hrs]

Drugs used in the Treatment of Heart Failure: Digitalis, Diuretics,

Vasodilators, ACE inhibitors, Antihypertensive drugs: Diuretics, Beta blockers, Calcium Channel Blockers. ACE inhibitors, Vasodilators & Antiarrhythmic Drugs.

Drugs used in the Treatment of Vascular Disease and Tissue Ischemia: Vascular drugs- Hemostasis Lipid-Lowering agents, Antithrombotics, Anticoagulants and Thrombolytics

Drugs used in the treatment of Ischemic Heart Disease- Nitrates, Beta-Blockers, Calcium Channel Blockers

Drugs used in the treatment of Cerebral Ischemia & Peripheral Vascular Disease

4. Neuropharmacology [10 Hrs]

Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines

Antianxiety Drugs: Benzodiazepines, Other Anxiolytics

Drug used in Treatment of Mood Disorders: Monoamine Oxidase Inhibitors, Tricyclic, Antidepressants, Lithium, Antipsychotic drugs

5. Disorders of Movement [8 Hrs]

Drugs used in Treatment of Parkinson's Disease

Antiepileptic Drugs

Spasticity and Skeletal Muscle Relaxants

6. Inflammatory/Immune Diseases [15 Hrs]

Non- narcotic Analgesic and Nonsteroidal Anti-Inflammatory Drugs: Acetaminophen, NSAIDs. Aspirin, Non aspirine NSAIDs,

Glucocorticoids: Pharmacological uses & Physiologic uses of Glucocorticoids, adverse effects.

Drugs used in Treatment of Arthritic Disease: Rheumatoid Arthritis, Osteoarthritis, Gout

Drug used in the Treatment of Neuromuscular Immune/Inflammatory Diseases; Myasthenia gravis, Idiopathic Inflammatory Myopathies, Systemic Lupus Erythmatosus, Scleroderma, Demyelinating Disease

Respiratory Pharmacology: Obstructive Airway Diseases, Drugs used in Treatment of Obstructive airway Diseases, Allergic Rhinitis

7. Digestion and Metabolism [10 Hrs]

Gastrointestinal Pharmacology: Peptic Ulcers Disease, Constipation, Diarrhoea

Drug used in Treatment of Diabetes Mellitus: Insulin, Oral Hypoglycaemic

drugs.

8. Geriatrics [8 Hrs]

Pharmacology and the geriatrics effects of special concern in the Elderly, Dementia, Postural hypotension.

Recommended Textbooks

1. *Lippicott's Pharmacology.*
2. *Essential of Medical Pharmacology by Tripathi*
3. *Text book of Medical Pharmacology by Padmaja Udayakumar*
4. *Pharmacology by N. Murugesh*
5. *Pharmacology & Pharmacotherapeutics by Sadoskar.*

MICROBIOLOGY & PATHOLOGY

Course Description

This subject follows the basics of anatomy, physiology and biochemistry and it forms a vital link between preclinical subjects and clinical subjects. Pathology involves the study of causes and mechanism of diseases. Microbiology involves the study of common organisms causing diseases including nosocomial infections and precautionary measures to protect one from acquiring infections. The knowledge and understanding of microbiology & pathology of diseases is essential to institute appropriate treatment or suggest preventive measures to the patient. Particular effort is made in this course to avoid burdening the student.

MICROBIOLOGY & PATHOLOGY

Subject Title	:MICROBIOLOGY
Duration	: 13-24 Months
Total Hours	: 60 Hrs
Theory	: 60Hrs
Total Hours/week	: 2 Hrs

THEORY**1. General Microbiology [7 Hrs]**

Definitions: infections, parasite, host, vector, fomite, contagious disease, infectious disease, epidemic, endemic, pandemic, Zoonosis, Epizootic, Attack rate.

Normal flora of the human body.

Routes of infection and spread endogenous and exogenous infections source at reservoir of infections.

Bacterial cell Morphology limited to recognizing bacteria in clinical samples Shape, motility and arrangement. Structures, which are virulence, associated

Essentials of bacterial growth requirements.

Sterilization, disinfection and universal precautions in relation to patient care and disease prevention.

Definition of asepsis, sterilization, disinfection. Antimicrobials: Mode of action, interpretation of susceptibility tests, resistance spectrum of activity.

2. Immunology [5 Hrs]

Basic principles of immunity immunobiology : lymphoid organs and tissue Antigen, Antibodies, antigen and antibody reactions with relevance to pathogenesis and serological diagnosis. Humoral immunity and its role in immunity Cell mediated immunity and its role in immunity. Immunology of hypersensitivity. Measuring immune functions.

3. Bacteriology [15 Hrs]

To be considered under the following headings Morphology, classification according to pathogenicity, mode of transmission, methods of prevention, transport of samples, interpretation of laboratory reports

Staphylococci.

Streptococci and Pneumococci,

Mycobacteria: Tuberculosis. M.leprae. atypical mycobacteria, Enterobacteriaceae

Vibrios : V. cholerae and other medically important vibrios, and

Pseudomonas

Bacillus anthracis

Sporing and non-sporing anaerobes Clostridia,

Bacteroides and Fusobacteria,

4. General Virology [8 hrs]

General properties: basic structure and broad classification of viruses Immunity and prophylaxis of viral diseases. Principles of laboratory diagnosis of viral diseases. List of commonly used antiviral agents.

5. Mycology: [3 Hrs]

General properties of fungi. Classification based on disease: superficial, subcutaneous, deep mycoses opportunistic infections including Mycotoxins, systemic mycoses. General principles of fungal diagnosis... Antifungal agents.

6. Clinical/Applied Microbiology [14 Hrs]

Streptococcal infections: Rheumatic fever and Rheumatic heart disease. Meningitis.

Tuberculosis, Pyrexia of unknown origin, leprosy.

Sexually transmitted diseases.

Poliomyelitis.
 Hepatitis,
 Acute-respiratory infections.
 Central nervous System infection
 Urinary tract infections.
 Pelvic inflammatory disease.
 Wound infection.
 Opportunistic infections,
 HIV infection.
 Malaria,
 Filariasis,
 Zoonotic diseases.

Laboratory Works only: [8Hrs]

1. Observation and study of common culture media
2. Observation and study of some clinically important bacteria – Staphylococcus, Streptococcus, E.coli , Mycobacterium
3. Observation of equipments and procedures used for sterilization and disinfection
4. Demonstration of stain Gram staining KOH preparation

Acid Fast staining

Recommended Textbooks:

1. Short text book of Medico! Microbiology by Sathish Gupta
2. Text book of Microbiology by Jayaram Panicker
3. Microbiology Parasitology by Rajeshwar Reddy
4. Text book of Microbiology by Anantha Narayanan
5. Microbiology by Baveja
6. Text book of microbiology by Chakraborty

Subject Title	PATHOLOGY
Duration	13-24 Months
Total Hours	60
Theory	60 Hrs
Total Hours/week	2 Hrs

THEORY

General Pathology

1. Introduction to pathology [1hrs]

2. Cell injuries : [4 hrs]

Aetiology and pathogenesis with a brief recall of important aspects of normal cell structure. Reversible cell injury: Types, sequential changes, cellular swellings, vacuolation, hyaline changes, mucoid changes. Irreversible cell injury: Types of necrosis and gangrene. Autolysis. Pathological calcification: Dystrophic and metastatic, intra cellular accumulations – fatty changes, protein accumulations, glycogen accumulations. Extra cellular accumulations: Amyloidosis – classification, pathogenesis, pathology including special stains.

3. Inflammation and repair: [3Hrs]

Acute inflammation: Features, causes, vascular & cellular events. Inflammatory cells and mediators. Chronic inflammation: Causes, types, classification non specific and granulomatous with examples. Repair wound healing by primary and secondary unions, factors promoting and delaying the process. Healing in specific site including bone healing.

4. Immunopathology: [2 Hrs]

Immune system; General concepts. Hypersensitivity: type and examples, antibody and cell mediated tissue injury with examples. Secondary immune deficiency including HIV infection auto immune disorder: Basic concepts and classification, SLE. AIDS – etiology, modes of transmission, diagnostic procedures, handling of infected material and health education.

5. Infectious disease: [4 Hrs]

Mycobacterial diseases: Tuberculosis, leprosy and syphilis. Bacterial disease: Pyogenic, diphtheria, gram negative infection, bacillary dysentery. Viral diseases: poliomyelitis, herpes, rabies, measles, , HIV infection. Fungal disease and. Parasitic diseases: Malaria, filaria, amoebiasis.

6. Circulatory disturbances: [3 hrs]

Hyperemia/Ischemia and haemorrhage. Edema: Pathogenesis and types. Chronic venous congestion: Lung, liver, spleen. Systemic pathology thrombosis and embolism; Formation fate and defects. Infarction; Types, common sites. Shock: Pathogenesis, types, morphologic changes.

7. Growth disturbances and neoplasia: [3 Hrs]

Neoplasia: Definition, classification, biological behavioral benign and malignant, carcinoma and sarcoma. Malignant neoplasia: Grades and stages, local and distant spread. Carcinogenesis: Environmental carcinogens, chemical, viral, occupational, heredity and cellular oncogens and prevention of cancer.

8. Urinary system: [1 Hrs]

Glomerular nephritis, Nephrotic Syndrome, Urinary tract infection, Renal calculi, Renal carcinomas

9. Nutritional disorders: [1 Hrs]

Protein energy malnutrition: Marasmus, kwashiorkor, and vitamin deficiency disorders, Obesity. Bulimia.

10. Genetic disorders: [2 Hrs]

Basic concepts of genetic disorders and some common examples and congenital malformation.

11. Hematology: [4 Hrs]

Constituents of blood & bone marrow. Regulation of homeopoesis

Anemia: Classification, clinical features & lab diagnosis.

Nutritional anemia: Iron deficiency anemia, Folic acid, Vit B 12 deficiency anemia including pernicious anemia. Hemolytic

Anaemias: Classification and Investigations. Hereditary hemolytic anaemias: Thalessemia, Sickle cell anemia, Spherocytosis and Enzyme deficiencies.

Leukocytic disorders: Leukocytosis, Leukopenis, Leukemoid reaction.

Leukemia: Blood transfusion; Grouping and cross matching, untoward reactions, transmissible infections including HIV & hepatitis. Blood-components & plasma-pheresis.

12. Respiratory System [3 Hrs]

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

13. Cardiovascular Pathology [3 hrs]

Congenital Heart disease: Atrial septal defect, Ventricular septal defect, Fallot's tetralogy. Patent ductus artcriosus. Endocarditis. Rheumatic Heart disease. Vascular diseases: Atherosclerosis, Aneurysm and Arteritis and tumours of Blood vessels. Ischemic heart Disease: Myocardial infarction. Hypertension and hypertensive heart Disease.

14. Alimentary tract [2 Hrs]

Oral Pathology: Ulcers, leukoplakia, Esophagus inflammatory, functional disorders. Stomach: Gastritis, Ulcer. large Intestine: Polyps, carcinoid, carcinoma, Lymphoma.

15. Hepato-biliary pathology [2 Hrs]

Jaundice: Types, aetio-pathogenesis and diagnosis. Hepatitis: Acute, Chronic, neonatal. Alcoholic liver disease common clinical conditions

16. Lymphatic System [2 Hrs]

Lymphadenitis Causes of Lymph Node enlargements common clinical conditions

17. Musculoskeletal System [6 Hrs]

Osteomyelitis, Metabolic diseases: Rickets/Osteomalacia, osteoporosis, Hyperparathyroidism, Paget's disease. Tumours Classification: Benign, Malignant, Metastatic and synovial sarcoma. Acute, chronic, Arthritis: Suppurative, Rheumatoid. Osteoarthritis, Gout, Tuberculous. Heamarthropathies Diseases of Muscles.

18. Endocrine pathology [3 Hrs]

Diabetes Mellitus: Types, Pathogenesis, Pathology Non-neoplastic lesions of Thyroid: Iodine deficiency goiter, autoimmune Thyroiditis, Thyrotoxicosis, myxedema. Hashimoto's thyroiditis..

19. Neuropathology: [5 Hrs]

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

CNS Tumors, Astrocytoma, Neuroblastoma, Meningioma, Medulloblastoma

Vascular lesions of CNS Poliomyelitis

Perpheral neuropathies including Diabetic neuropathies,

Parkinsonism

Dementia - Alzheimer's disease
Disorders of spinal cord – SCD, Trauma, Syringomyelia, Tabes dorsalis

Practical [5 Hours]

Demonstration of relevant slides and demonstration of the Lab evidences of common Neuro Musculoskeletal and Cardio Vascular and pulmonary Diseases.

Recommended Textbooks

1. *Text book of pathology by Harshmohan*
2. *Text book of pathology by Robbins*
3. *Pathological Implications for Physical Therapists by Catherine Cavallaro Goodman , Kenda S Fuller*

Medical Instrumentation

Course Description.

The Subject is designed to provide an overview in the basics of the medical equipments that are seen by the students in their clinical practice. The student is to be able to understand the mechanism of Physiotherapeutic instruments and its repair and Maintenance.

Subject Title	: MEDICAL INSTRUMENTATION
Duration	: 13-24 Months
Total Hours	: 20
Theory	: 20 Hours
Total Hours / Week	: 1 Hour/ Week

Theory

1. Micro & Macro shock, source of shock, monitoring & interrupting circuit from shock
2. Maintenance of equipments – Preventive maintenance, break down maintenance
3. Short wave diathermy
4. Microwave diathermy
5. Muscle and nerve stimulator
6. UV Rays
7. Stimulators including IFT (Interferential Therapy)
8. Laser

9. Ultrasound, Cathode Ray, Oscilloscope
10. ECG Equipment & Technique
11. EMG Equipment & Technique
12. EEG Equipment & Technique
13. Pacemakers, Defibrillators, Ventilators
14. Audiometer, Fiber Optic light source
15. pH Meter
16. Endoscopy

References:

1. Handbook Of Analytical Instruments – R.S Khnadpur.
2. Handbook Of Biomedical Instrumentation – R.S Khnadpur.
3. Biomedical Instrumentation – Dr. M. Arumugham.
4. Biomedical Instruments and Measurements - Cromwell

COMPUTER SCIENCE

Course Description

At the completion of this course the student will have a basic knowledge about computers and how to deal with different types of programmes, and how to use Computers in education and clinical practice.

Subject Title	:	Computer Science
Duration	:	0-12 Months
Total Hours	:	60
Theory	:	30 Hours
Practical	:	30Hours
Total Hours/week	:	2 Hr

I. [2Hrs]

1. History of computers
2. Type of computer Generation
3. Digital computer Organization
4. Binary number System

II [2 Hrs]

- i. Database Management System concepts
- ii. Introduction to computer programming and application software
- iii. Computer Networks

- a. LAN
- b. WAN
- c. MAN
- d. Internet Concept

III [5 Hrs]

1. Current Operating systems

2. Application Software MS OFFICE 2000 (MS WORD, EXCEL, MS POWERPOINT)

IV [11 Hrs]

1. Application of computers in Health Education Training and Administration.
2. Application to various aspects of Physiotherapy Practice – Biofeedback, Simulations and virtual reality etc.

V. Practical [40 Hrs]

Recommended Books

1. Computer Network - Andrew S. Tanenbaum
2. Health Information management of a Strategic Resource - Mervat Abdelhak

BPT III YEAR

GENERAL MEDICINE & GENERAL SURGERY

Subject Description

This subject follows the basic science subjects to provide the knowledge about relevant aspects of general medicine and surgery. The student will have a general understanding of the diseases and surgeries that the therapist would encounter in their practice. The objective of this course is that after 120 hrs of lectures and discussion the student will be able to list the etiology, pathology, clinical features and treatment methods for various medical conditions and shall be able to enlist the indications for surgery, etiology, clinical features and surgical methods for various conditions.

Subject Title	:	General Medicine & Surgery
Duration	:	25 – 36 Months
Total Hours	:	90
Theory / Lecture	:	3 Hours / Week
Method of Assessment	:	Written

1. Infection: Effects of Infection on the body –source and spread of infection – vaccinations – generalized infections – rashes and infection – food poisoning and gastroenteritis – sexually transmitted diseases [3 Hours]

2. Food and Nutrition : Assessment – Nutritional and Energy requirements; Deficiency diseases – clinical features and treatment; Protein – Energy Malnutrition : Clinical features and treatment; Obesity and its related disorders : Causes – Complications – benefits of weight loss – management of Obesity – diet, exercise and medications.[6 Hours]

3. Endocrine diseases: Common presenting symptoms of Endocrine disease – common classical disease presentations, clinical features and its management; Diabetes Mellitus : Etiology and pathogenesis of diabetes – clinical manifestations of the disease – management of the disease – Complications of diabetes. [4 Hours]

4. Diseases of the blood : Examinations of blood disorders – Clinical manifestations of blood disease; Anemia – signs and symptoms – types and management ; Hemophilia - Cause – clinical features severity of disease – management – complications due to repeated haemorrhages – complications due to therapy. [6 Hours]

6. Diseases of the digestive system : Clinical manifestations of gastrointestinal disease – Aetiology, clinical features, diagnosis, complications and treatment of common conditions. Infections of Alimentary Tract ; Clinical manifestations of liver diseases - Aetiology, clinical features, diagnosis, complications and treatment of the common conditions [7 Hours]

7. Cardiovascular Disease : Examination of the Cardiovascular System – Investigations : ECG, Exercise Stress Testing, Radiology ; Clinical manifestations of Cardiovascular disease ; Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases and disorders of the heart : Pericarditis, Myocarditis, Endocarditis, Rheumatic Fever – resulting in valve disorders, Ischemic Heart Disease, Coronary Valve Disease, Congenital disorders of

the Heart, Cardiac Arrest ; Examination and Investigations of diseases of arteries and veins ; Hypertension : Definition, causes, classification, types, assessment, investigations and management. [8 Hours]

8. Respiratory Disease : Examination of the Respiratory System – Investigations : Chest Radiographs, Pulmonary Function Testing, Arterial Blood Gas Analysis ; Clinical manifestations of Lung disease ; Patterns of lung disease – Chronic Obstructive Lung Disease and Restrictive Lung Disease ; Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following Obstructive and restrictive lung diseases [9 Hours]

9. Diseases of the Skin: Examination and clinical manifestations of skin diseases; Causes, clinical features and management of the following skin conditions: Leprosy, Psoriasis, Vasomotor disorders, Dermatitis, Coccal and Fungal Parasitic and Viral infections. [4 Hours]

10. Pediatrics: Problems and management of LBW infants, Perinatal problems and management, Congenital abnormalities and management, Respiratory conditions of childhood, Cerebral Palsy – causes, complications, clinical manifestations, treatment ; Spina Bifida – management and treatment, Epilepsies – types, diagnosis and treatment; Recognizing developmental delay, common causes of delay ; Orthopedic and Neuromuscular disorders in childhood, clinical features and management ; Sensory disorders – problems resulting from loss of vision and hearing ; Learning and behavioural problems – Hyperactivity, Autism, Challenging behaviours, Educational delay, The Clumsy Child. [8 Hours]

11. Psychiatric Disorders: Classifications, Causes, Clinical manifestations and treatment methods used in Psychiatry. [5 Hours]

Recommended books:

1. Davidson's Principles and Practice of Medicine
2. Harrison's Internal Medicine
3. Braunwald Text of Cardiology
4. Text Book of Cardiology by Hurst

General Surgery

1. Fluid, Electrolyte and Acid-Base disturbances – diagnosis and management ; Nutrition in the surgical patient ; Scars – types and treatment. Hemostasis – components, hemostatic disorders, factors affecting bleeding during surgery. Transfusion therapy in surgery – blood components, complications of transfusion ; Surgical Infections ; General Post – Operative Complications and its management [6 Hours]
2. Reasons for Surgery ; Types of anaesthesia and its affects on the patient ; Types of Incisions ; Clips Ligatures and Sutures ; General Thoracic Procedures – Radiologic Diagnostic procedures, Endoscopy – types, Biopsy – uses and types. Overview and Drainage systems and tubes used in Surgery.[3 Hours]
3. Causes, Clinical Presentation, Diagnosis and treatment of the following Thoracic Trauma situations – Airway obstruction, Pnuemothorax, Hemothorax, Cardiac Tamponade, Tracheobronchial disruption, Aortic disruption, Diaphragmatic disruption, Esophageal disruption, Cardiac and Pulmonary Contusions. [4 Hours]
4. Surgical Oncology – Cancer – definition, types, clinical manifestations of cancer, Staging of Cancer, surgical procedures involved in the management of cancer. [3 Hours]
5. Disorders of the Chest Wall, Lung and Mediastinum – Definition, Clinical features, diagnosis and choice of management for the following disorders – chest wall deformities, Spontaneous Pneumothorax, Pleural Effusion, Empyema Thoracis, Lung abscess, Bronchiectasis, Tuberculosis, tracheal Stenosis, Carcinoma of the female breast. [5 Hours]
6. Disorders of the Heart – Definition, Clinical features, diagnosis and choice of management for the following disorders : Congenital Heart diseases – Acyanotic congenital heart disease & Cyanotic congenital heart disease : Patent Ductus Arteriosus, Coarctation of Aorta, Atrial Septal Defect, Ventricular Septal Defect, Tetraology of Fallot, Transposition of Great

Vessels ; Acquired Heart Disease – Mitral Stenosis & Insufficiency, Aortic Stenosis and Insufficiency, Ischemic Heart Disease – Coronary Artery Disease, Cardiac tumors. [6 Hours]

7. Thoracic surgeries – Thoracotomy – Definition, Types of Incisions with emphasis to the site of incision, muscles cut and complications. Lung surgeries Pneumonectomy, Lobectomy, segmentectomy – Indications, Physiological changes and Complications ; Thoracoplasty, Pleurectomy, Pleurodesis and Decortication of the Lung. Cardiac surgeries – An overview of the Cardio-Pulmonary Bypass Machine – Extracardiac Operations, Closed Heart surgery, Open Heart surgery. Transplant Surgery – Heart, Lung and Kidney – Indications, Physiological changes and Complications. [6 Hours]

8. Diseases of the Arteries and Veins : Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases : Arteriosclerosis, Atherosclerosis, Aneurysm, Buerger's disease, Raynaud's Disease, Thrombophlebitis, Deep Vein Thrombosis, Pulmonary Embolism, Varicose Veins. [5 Hours]

9. Definition, Indication, Incision, Physiological changes and Complications following Common operations like Cholecystectomy, Colostomy, Ileostomy, Gastrectomy, Hernias, Appendectomy Mastectomy, Nephrectomy, Prostatectomy. [4 Hours]

10. Burn: Definition, Classification, Causes, Prevention, Pathological changes, Complications, Clinical Features and Management. Skin Grafts – Types, Grafting Procedures, Survival of Skin Graft ; Flaps – Types and uses of Flaps. [4 Hours]

11. Womens Health : Menstrual cycle and its disorders. Hormonal disorders of females-obesity and female hormones. Cancer of the female reproductive organs-management Infections and sexually transmitted disease in female Menopause - its effects on emotions and musculoskeletal system. Malnutrition and deficiencies in females. Maternal physiology in pregnancy. Musculo skeletal disorders during pregnancy. Prenatal complications-investigations- management. Child birth- Stages complications-investigations-management – Pain relief in labour - Puerperium - Post Natal care. Surgical procedures involving child birth. Incontinence – Types, Causes,

Assessment and Management. Definition, Indications and Management of the following surgical procedures – Hysterosalphyngography, Dilatation and Curettage, Laparoscopy, Colposcopy, Hysterectomy. [8 Hours]

12. ENT: Common problems of ear, otitis media, Otosclerosis, functional achonia and deafness, management facial palsy classification, medical and surgical management of lower motor neuron type of facial palsy. [3 Hours]

13. Ophthalmology: Ophthalmologic surgical conditions, refraction's, conjunctivitis, glaucoma, corneal ulcer, iritis, cataract, retinitis, detachment of retina, defects of extra-ocular muscles surgical management [3 Hours]

Recommended books:

1. General Surgical Operations – by Kirk / Williamson
2. Surgery by Nan
3. Bailey and Love's – Short Practice of Surgery
4. Chest Disease by Crofton and Douglas.
5. Patricia A Downie, Text book of Heart, Chest Vascular Disease for physiotherapists, JP Bros.

PHYSIOTHERAPY IN GENERAL MEDICINE AND SURGERY

Subject Description

The subject is designed to provide knowledge in assessing and planning physiotherapy interventions for various General, Medical and Surgical conditions. The student must be able to reassess the patient as necessary, to monitor the patient in regard to treatment, to monitor the patient's vital signs , and to provide appropriate interventions to the patient considering current evidence based guidelines.

Subject Title	: Physiotherapy in General Medicine & Surgery
Duration	: 25 – 36 Months
Total Hours	: 240Hrs
Theory	: 150 Hours
Practical	: 90 Hours
Total Hours / Week	: 5 Hrs
Lecture	: 3 Hours / Week
Practicals	: : 2 Hours / Week

Method of Assessment: Written, Oral, Practical

1. Bedside assessment of the patients –ADULT AND PAEDIATRIC [8Hours]
2. Investigations and tests-Exercise tolerance testing-cardiac&pulmonary ,radiographs,PFT,ABG,ECG,,hematological and biochemical tests.(5 Hours)
3. Management of wound ulcers- Care of ulcers and wounds - Care of surgical scars using electro therapeutics for healing of wounds, prevention of Hyper granulated Scars Keoloids,
Electrotherapeutics measures for relief of pain during mobilization of scars tissues. [8 Hours]
4. Physiotherapy in dermatology - Documentation of assessment, treatment and follow up skin conditions. U.V.R therapy in various skin conditions; Vitiligo; Hair loss; Pigmentation; Infected wounds ulcers. Faradic foot bath for Hyperhydrosis. Massage maneuvers for cosmetic purpose of skin Care of anesthetic hand and foot; (8 Hours)
5. Evaluation, planning and management of leprosy-prescription, fitting and training of devices and prevention of disability [8 Hours]
6. Introduction toICU:ICU monitoring-apparatus, airways and tubes used in the ICU,physiotherapy in ICU,dealing with emergency situation in ICU(8 hours)
7. Burns management - Role of physiotherapy in the management of burns, post grafted cases- Mobilization and Musculo-skeletal restorative exercises following burns [8 Hours]
8. Physiotherapy management following PVD [6 Hours]
9. Abdominal Surgeries - Management of Pulmonary Restorative function following Surgical procedures on Abdomen and Thorax [10 Hours]
10. Physiotherapy techniques to increase lung volume-controlled lung mobilization,positioning,breathing exercises, Mechanical aids- IPPB,CPAP,IPPB(10 Hours)
11. . Management of Amputations following Diabetes, PVD - Prosthesis in amputations of lower limbs following ulcers and gangrenes [10 Hours]
12. Physiotherapy intervention in the management of Medical, Surgical and Radiation Oncology Cases [8 Hours]
13. Physiotherapy techniques to clearing secretions- hydration,humidification,&nebulization, mobilization and breathing exercises,

postural drainage, manual techniques ACBT ,autogenic drainage, mechanical aids like PEP ,IPPB,facilitation of cough and huff

14. Physiotherapy for Plastic surgery and Organ transplantations [5 Hrs]
15. Home program and education of family members in patient care [8 Hours]
16. Physiotherapy in Obstetrics – Physiotherapy in pregnancy. Electrotherapy and Exercise Therapy measures for the Women’s health issues [10 Hours]
17. Treatment, Response to exercise and Implications of Physiotherapy in the following disease conditions: Hypertension, Diabetes, Renal Failure and Obesity. [8 Hours]
18. .Health Fitness and Promotion : Fitness Evaluation, Analysis of Body composition, Evaluation and prescription of Exercise, Factors affecting exercise Performance, Exercise Prescription for Specific groups : Elderly, Women and Children. [10 Hours]
19. Role of P.T in management of age related diseases and disorders such as – Osteoporosis, Dementia, Fall prevention and fitness programmes. [10 Hours]
20. Outcome measurement in General surgical and medical Physiotherapy care[10 Hrs]

Recommended books:

Tidy's physiotherapy.

Physical Rehabilitation Assessment and Treatment – O’Sullivan Schmitz

Cash’s Text book of General Medicine and Surgical conditions for Physiotherapists.

Physical Therapy for the Cancer patient by M.C Garvey

Physiotherapy in Obstetrics and Gynecology by Polden

CLINICAL ORTHOPEDICS & SPORTS MEDICINE

Subject Description This subject follows the basic science subjects to provide the knowledge about orthopedic conditions the therapists would encounter in their practice. The objective of this course is that after 60 hrs of lectures and discussion the student will be able to demonstrate an understanding of orthopedic conditions causing disability, list the etiology, clinical features and methods of Investigations and management.

Subject Title	: CLINICAL ORTHOPEDICS & SPORTS MEDICINE
Duration	: 25 – 36 Months
Total Hours	: 60
Theory / Lecture	: 2 Hours / Week
Method of Assessment:	Written

1. Introduction [3 Hours]

Introduction to orthopaedics. Clinical examination in an Orthopedic patient. Common investigative procedures. Radiological and Imaging techniques in Orthopaedics. Inflammation and repair, Soft tissue healing.

2. Traumatology [3 Hours]

Fracture: definition, types, signs and symptoms. Fracture healing. Complications of fractures. Conservative and surgical approaches. Principles of management – reduction (open/closed, immobilization etc). Subluxation/ dislocations – definition, signs and symptoms, management (conservative and operative).

3. Fractures and Dislocations of Upper Limb [6 Hours]

Fractures of Upper Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures:

Fractures of clavicle and scapula. Fractures of greater tuberosity and neck of humerus. Fracture shaft of humerus. Supracondylar fracture of humerus. Fractures of capitulum, radial head, olecranon, coronoid, and epicondyles. Side swipe injury of elbow. Both bone fractures of ulna and radius. Fracture of forearm – Monteggia, Galeazzi fracture – dislocation. Chauffeur's fracture. Colle's fracture. Smith's fracture. Scaphoid fracture. Fracture of the metacarpals. Bennett's fracture. Fracture of the phalanges. (Proximal and middle.) Dislocations of Upper Limb - Anterior dislocation of shoulder – mechanism of injury, clinical feature, complications, conservative management (Kocher's and Hippocrates maneuver), surgical management (Putti-Platt, Bankart's) etc. Recurrent dislocation of shoulder. Posterior dislocation of

shoulder – mechanism of injury, clinical features and management. Posterior dislocation of elbow – mechanism of injury, clinical feature, complications & management.

4. Fracture of Spine [4 Hours] Fracture of Cervical Spine - Mechanism of injury, clinical feature, complications (quadriplegia); Management- immobilization (collar, cast, brace, traction); Management for stabilization, management of complication (bladder and bowel, quadriplegia). Clay shoveller's fracture. Hangman's fracture. Fracture odontoid. Fracture of atlas. Fracture of Thoracic and Lumbar Regions - Mechanism of injury, clinical features, management —conservative and surgical of common fractures around thoracic and lumbar regions. Fracture of coccyx. Fracture of Rib Cage - Mechanism of injury, clinical features, management for Fracture Ribs, Fracture of sternum.

5. Fractures and Dislocations of Lower Limb [5 Hours] Fracture of Pelvis and Lower Limb - causes, clinical features, mechanism of injury, complications, conservative and surgical management of the following fractures: Fracture of pelvis. Fracture neck of femur – classification, clinical features, complications, management - conservative and surgical. Fractures of trochanters. Fracture shaft femur—clinical features, mechanism of injury, complications, management-conservative and surgical. Supracondylar fracture of femur. Fractures of the condyles of femur. Fracture patella. Fractures of tibial condyles. Both bones fracture of tibia and fibula. Dupuytren's fracture. Pott's fracture – mechanism of injury, management. Bimalleolar fracture Trimalleolar fracture Fracture calcaneum – mechanism of injury, complications and management. Fracture of talus. Fracture of metatarsals—stress fractures jone's fracture. Fracture of phalanges. Dislocations of Lower Limb - mechanism of injury, clinical features, complications, management of the following dislocations of lower limb. Anterior dislocation of hip. Posterior dislocation of hip. Central dislocation of hip. Dislocation of patella. Recurrent dislocation of patella.

6. Soft Tissue Injuries [3 Hours] - Define terms such as sprains, strains, contusion, tendinitis, rupture, tenosynovitis, tendinosis, bursitis. Mechanism of injury of each, clinical features, managements- conservative and surgical of the following soft tissue injuries: Meniscal injuries of knee. Cruciate injuries of knee. Medial and lateral collateral injuries of knee. Lateral ligament of ankle. Wrist sprains. Strains-

quadriceps, hamstrings, calf, biceps, triceps etc. Contusions- quadriceps, gluteal, calf, deltoid etc. Tendon ruptures-Achilles, rotator cuff muscles, biceps, pectorals etc.

7. Hand Injuries [2 Hours]- mechanism of injury, clinical features, and management of the following - Crush injuries. Flexor and extensor injuries. Burn injuries of hand.

8. Amputations [2 Hours] - Definition, levels of amputation of both lower and upper limbs, indications, complications.

9. Traumatic Spinal Cord Injuries [2 Hours] - Clinical features, complications, medical and surgical management of Paraplegia and Quadriplegia.

10. Deformities [6 Hours] - clinical features, complications, medical and surgical management of the following Congenital and Acquired deformities. Congenital Deformities - CTEV. CDH. Torticollis. Scoliosis. Flat foot. Vertical talus. Hand anomalies- syndactyly, polydactyly and ectrodactyly. Arthrogryposis multiplex congenita(amyoplasia congenita). Limb deficiencies- Amelia and Phocomelia. Klippel feil syndrome. Osteogenesis imperfecta(fragile ossium). Cervical rib. Acquired Deformities - Acquired Torticollis. Scoliosis. Kyphosis. Lordosis. Genu varum. Genu valgum. Genu recurvatum Coxa vara. Pes cavus. Hallux rigidus. Hallux valgus. Hammer toe. Metatarsalgia.

11. Disease of Bones and Joints [4 Hours]: Causes, Clinical features, Complications, Management- medical and surgical of the following conditions Infective conditions: Osteomyelitis (Acute / chronic). Brodie's abscess. TB spine and major joints like shoulder, hip, knee, ankle, elbow etc. □Arthritic conditions: Pyogenic arthritis. Septic arthritis. Syphilytic infection of joints. □Bone Tumors: classification, clinical features, management - medical and surgical of the following tumors : Osteoma. Osteosarcoma, Osteochondroma. Enchondroma. Ewing's sarcoma. Gaint cell tumor. Multiple myeloma. Metastatic tumors. Perthes disease, Slipped Capital Femoral Epiphysis and Avascular Necrosis. Metabolic Bone Diseases: Rickets. Osteomalacia, Osteopenia. Osteoporosis.

12. Inflammatory and Degenerative Conditions [4 Hours]: causes, clinical feature, complications, deformities, radiological features, management- conservative and surgical for the following conditions :Osteoarthritis. Rheumatoid arthritis. Ankylosing spondylitis Gouty arthritis. Psoriatic arthritis. Hemophilic arthritis. Still's disease (juvenile rheumatoid arthritis). Charcot's joints. Connective Tissue Disorders- Systemic Lupus Erythematosus, Scleroderma, Dermatomyositis, Poliomyelitis, Mixed connective tissue Disease (MCTD)

13. Syndromes [3 Hours]: Causes, Clinical features, complications, management- conservative and surgical of the following : Cervico brachial syndrome. Thoracic outlet syndrome. Vertebro- basilar syndrome. Scalenus syndrome. Costo clavicular syndrome. Levator scapulae syndrome. Piriformis syndrome

14. Neuromuscular Disorders [3 hours]: Definition, causes, clinical feature, complications, management. (Multidisciplinary approach) medical and surgical of the following conditions :Cerebral palsy. Poliomyelitis. Spinal Dysraphism. Leprosy.

15. Cervical and Lumbar Pathology [3 Hours]: Causes, clinical feature, pathophysiology, investigations, management-Medical and surgical for the following : Prolapsed intervertebral disc (PID), Spinal Canal Stenosis. Spondylosis (cervical and lumbar) Spondylolysis. Spondylolisthesis. Lumbago/ Lumbosacral strain. Sacralisation. Lumbarisation. Coccydynia. Hemivertebra.

16. Orthopedic Surgeries [3 Hours]: Indications, Classification, Types, Principles of management of the following Surgeries :Arthrodesis. Arthroplasty (partial and total replacement). Osteotomy , External fixators. Spinal stabilization surgeries(Harrington's, Luque's, Steffi plating) etc , Limb re-attachments.

17. Regional Conditions [4 Hours]: Definition, Clinical features and management of the following regional conditions

- Shoulder: Periarthritic shoulder (adhesive capsulitis). Rotator cuff tendinitis. Supraspinatus Tendinitis. Infraspinatus Tendinitis. Bicipital Tendinitis. Subacromial Bursitis.

- Elbow: Tennis Elbow. Golfer's Elbow. Olecranon Bursitis (student's elbow). Triceps Tendinitis.
- Wrist and Hand: De Quervain's Tenosynovitis. Ganglion. Trigger Finger/ Thumb. Mallet Finger, Carpal Tunnel Syndrome, Dupuytren's Contracture.
- Pelvis and Hip : IT Band Syndrome. Piriformis Syndrome. Trochanteric Bursitis.
- Knee: Osteochondritis Dissecans. Prepatellar and Suprapatellar Bursitis. Popliteal Tendinitis. Patellar Tendinitis. Chondromalacia Patella. Plica Syndrome. Fat Pad Syndrome (Hoffa's syndrome).
- Ankle and Foot: Ankle Sprains. Plantar Fasciitis / Calcaneal Spur. Tarsal Tunnel Syndrome. Achilles Tendinitis. Metatarsalgia. Morton's Neuroma.

Books Recommended:

1. Outline of Fractures—John Crawford Adams.
2. Outline of Orthopedics.— John Crawford Adams.
3. Text book of Orthopedics.—Maheswari.
4. Apley's Orthopedics.
5. Textbook of Orthopedics and Traumatology— M.N.Natarajan

PHYSIOTHERAPY IN ORTHOPEDICS & SPORTS

Subject Description The subject serves to integrate the knowledge gained by the students in orthopedics and traumatology with skills to apply these in clinical situations of dysfunction and musculoskeletal pathology. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify, assess and diagnose movement dysfunction and functional limitations due to musculoskeletal diseases, independently plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore musculoskeletal function considering current evidence based guidelines.

Subject Title	: PHYSIOTHERAPY IN ORTHOPEDICS & SPORTS
Duration	: 25 – 36 Months
Total Hours	: 150
Theory	: 90 Hours
Practical	: 60 Hours
Total Hours / Week	: 5 Hrs
Lecture	: 3 Hours / Week
Practical	: 2 Hours / Week
Method of Assessment: Written, Oral, Practical	

1. PT assessment for Orthopedic conditions - SOAP format. Subjective - history taking, informed consent, personal, past, medical and socioeconomic history, chief complaints, history of present illness. Pain assessment- intensity, character, aggravating and relieving factors, site and location. Objective- on observation - body built swelling, muscle atrophy, deformities, posture and gait. On palpation- tenderness-grades, muscle spasm, swelling-methods of swelling assessment, bony prominences, soft tissue texture and integrity, warmth and vasomotor disturbances. On examination – ROM – active and passive, resisted isometric tests, limb length- apparent, true and segmental , girth measurement, Muscle imbalance and muscle length testing-tightness, contracture and flexibility, manual muscle testing, peripheral neurological examination dermatomes, myotomes and reflexes, special tests and functional tests. Physical diagnosis and differential diagnosis, Prescription of home program. Documentation of case records, and follow up. Various methods of Measurement of outcomes [8 Hours]

2. Fractures - Physiotherapy assessment in fracture cases. Aims of PT management in fracture cases - short and long term goals. Principles of PT management in fractures - Guidelines for fracture treatment during period of immobilization and guidelines for treatment after immobilization period. PT management in complications - early and late - shock, compartment syndrome, VIC, fat embolism, delayed and mal union, RSD, myositis ossificans, AVN, pressure sores etc. [4 Hours]

3. Specific fractures and dislocations : PT assessment and management of upper limb fractures and dislocations. PT assessment and management of lower limb fractures and dislocations including pelvis. PT assessment and management spinal fractures. [4 Hours]

4. Selection and application of physiotherapeutic techniques, maneuver's, modalities for preventive, curative and rehabilitative means in all conditions. [5 Hours]

5. Principles of application of various schools of thought in manual therapy. (Briefly Maitland and Mc kenzie). [3 Hours]

6. Degenerative and Inflammatory conditions: Definition, signs and symptoms, clinical features, patho physiology, radiological features, deformities, medical, surgical management. Describe the PT assessment and management and home program for the following conditions – Osteoarthritis - emphasis mainly on knee, hip and hand, Rheumatoid Arthritis, Ankylosing spondylitis, Gout, Perthes disease, Periarthritic shoulder. [3 Hours]

7. Infective conditions: Definition, signs and symptoms, clinical features, pathophysiology, radiological features, medical, surgical management. Describe PT assessment and management for following conditions – Osteomyelitis – acute and chronic, Septic arthritis, Pyogenic arthritis, TB spine and major joints - knee and hip. [2 Hours]

8. Define, review the postural abnormalities of spinal column, clinical features, deformities, medical and surgical management. Describe PT assessment and management and home program. [3 Hours]

9. Deformities: Review in detail the causes, signs and symptoms, radiological features, medical and surgical management. Describe the PT. assessment and management of the following conditions : Congenital : CTEV, CDH, Torticollis, pes planus, pes cavus and other common deformities. Acquired: scoliosis, kyphosis, coxa vara, genu varum, valgum and recurvatum. [3 Hours]

10. Poliomyelitis: Definition, etiology, types, pathophysiology, clinical features, deformities, medical and surgical management. PT. assessment and management after surgical corrections and reconstructive surgeries - emphasis on tendon transfer and home program. [2 Hours]

11. Leprosy: Definition, cause, clinical features, medical and surgical management. PT assessment, aims, and management after surgical procedures such as tendon transfer both pre and post operatively. [2 Hours]

12. Amputations: Definition, levels, indications, types, PT assessment, aims, management pre and post operatively. PT management with emphasis on stump care and bandaging. Pre and post prosthetic training, checking out prosthesis, complications of amputations and its management. [5 Hours]

13. Spinal conditions: Review the causes, signs and symptoms, investigations, radiological features, neurological signs. PT assessment, aims, and management and home program of the following conditions: Cervical spondylosis, Lumbar spondylosis, Spondylolisthesis, Spinal canal stenosis, Spondylolysis, Sacro-iliac joint dysfunction, Sacralisation, Lumbarisation, Intervertebral disc prolapse, Coccydynia, Spina bifida occulta. [8 Hours]

14. Effects of spinal traction, types of traction, modes of application, indications for spinal traction, contraindications, precautions, limitations of traction. [2 Hours]

15. Osteoporosis- causes, predisposing factors, investigations and treatment. [1 Hour]

16. Orthopedic surgeries: Pre and post operative PT assessment, goals, precautions and PT management of following surgeries such as : Arthrodesis, Osteotomy, Arthroplasty-partial and total - Excision arthroplasty, excision arthroplasty with implant, interpositional arthroplasty and total replacement; Tendon transplant, Soft tissue release- tenotomy, myotomy, lengthening; Arthroscopy, Spinal stabilization, Re-attachment of limbs, External fixators, Synovectomy. [6 Hours]

17. Shoulder joint : Shoulder instabilities, TOS, RSD, Impingement syndrome – conservative and Post operative PT management. Total shoulder replacement and Hemi replacement. - Post operative PT management. AC joint injuries - rehabilitation. Rotator cuff tears conservative and surgical repair. Subacromial decompression - Post operative PT management. [3 Hours]

18. Elbow and forearm: Excision of radial head - Post operative PT management. Total elbow arthroplasty- Post operative PT management. [2 Hours]

19. Wrist and Hand: Total wrist arthroplasty. Repair of ruptured extensor tendons. Carpal tunnel syndrome. Flexor and extensor tendon lacerations - Post operative PT management. [3 Hours]

20. Hip: Joint surgeries - hemi and total hip replacement - Post operative PT management Tendonitis and bursitis. - Management. [2 Hours]

21. Knee: Lateral retinacular release, chondroplasty- Post operative management. Realignment of extensor mechanism. ACL and PCL reconstruction surgeries - Post operative rehabilitation. Meniscectomy and meniscal repair - Post operative management. Plica syndrome, patellar dysfunction and Hoffa's syndrome- conservative management. TKR- rehabilitation protocol. Patellar tendon ruptures and Patellectomy- rehabilitation. [5 Hours]

22. Ankle and foot: Ankle instability. Ligamentous tears- Post operative management. [2 Hour]

23. Sports Physiotherapy : Physical fitness. Sports diet, Stages of soft tissue healing. Treatment guidelines for soft tissue injuries- Acute, Sub acute and chronic stages. Repair of soft tissues- rupture of muscle, tendon and Ligamentous tears. Soft tissue injuries- prevention and rehabilitation of, Lateral ligament sprain of ankle. Rotator cuff injuries. Collateral and Cruciate injuries of knee. Meniscal injuries of knee. Supraspinatus and Bicipital tendonitis . Pre patellar and Subacromial bursitis. Tennis and Golfer's elbow. Hamstring strains, Quadriceps contusion, TA rupture.

Dequervain's tenosynovitis. Trigger and Mallet finger. Plantar fasciitis. Wrist sprains. Prevention of sports injuries, Doping [12 Hours]

Practical: 60 Hours

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

- Bedside case presentations and case discussions in the wards
- Demonstration of application of Physiotherapeutic techniques on patients in Physiotherapy O.P.D
- Participation under faculty guidance in management.
- Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

Desirable – Participation in management on sports field

Recommended books:

1. Tidy's physiotherapy.
2. Textbook of orthopedics- Cash.
3. Clinical orthopedic rehabilitation- Brotzman.
4. Orthopedic physiotherapy - Jayant Joshi.
5. Physical Rehabilitation Assessment and Treatment – O'Sullivan Schmitz
6. Sports physiotherapy- Maria Zuluaga
7. Differential Diagnosis for Physical Therapists-Goodman & Snyder
8. Orthopedic Physical Assessment-David J Magee
9. Management of Common Musculoskeletal Disorders- Hertling D, Kessler RM

REHABILITATION SCIENCE

The subject serves to integrate the knowledge gained by the students in rehabilitation sciences and Prosthetics and Orthotics with skills to apply these in clinical situations of disability prevention and rehabilitation. The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify rehabilitation methods to prevent and reduce the limitations caused by disabilities and dysfunctions resulting from various disease conditions and to plan and set treatment goals considering current evidence based guidelines and apply the skills gained in rehabilitating and restoring functions.

Subject Title	:	Rehabilitation Science
Duration	:	25 – 36 Months
Theory	:	60 Hours
Practical	:	30 Hours
Total Hours	:	90 Hrs
Lecture	:	3 Hours / Week
Method of Assessment:		Written, Oral, Practical

REHABILITATION

1. Introduction to rehabilitation
 - Philosophy and need of rehabilitation.
 - Principles of Physical medicine.
 - Role of members of rehabilitation team
 - Basic principles of administration and organization
7. Disability prevention and rehabilitation :
 - Concept of impairment, Disability and Handicap or Functional Limitation
 - Disability evaluation methods and purpose
3. Disabled and the society ,Legal aspects of disability in terms of compensation and benefits. Government's policies and rehabilitation Council. Concept of Barrier free environment
 - Role of voluntary Organizations in CBR: Charitable Organizations, Voluntary health agencies –National level and International NGO's, Multilateral and Bilateral agencies. International Health Organizations. [4 hours]
 - National District Level Rehabilitation Programme: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker [5 hours]
 - Vocational training in rehabilitation: Introduction, Need, Vocational evaluation, Vocational rehabilitation services [2 hours]
4. Occupational therapy : Introduction to Occupational therapy, Philosophy and principles of Occupational Therapy, Therapeutic Media and Modalities in O.T, Role of O.T in Mental Health Physical Function and well being.

5. Speech and Language disorders and rehabilitation: Brief description of Anatomy and physiology, Classification of the disorders and respective management strategies.
6. Principles of Orthotics: Indications Prescription and training in usage Lower Extremity Orthotic, Upper Extremity Orthotic Spinal Orthotic
7. Principles of Prosthetics: Indications Prescription and training in usage Lower Extremity Prosthetics and Upper Extremity Prosthetics
8. Mobility aids and assistive devices: Principles involved in prescribing, Classification, and Levels and Methods of training in use.

Practical: 30 Hours

The student should be provided exposure to the basics of Prosthesis and Orthosis measurements, construction, checkout and methods of training in their usage, including that of Wheel chairs.

They should become capable of designing and making basic splints and Assistive devices with locally available materials.

They must visit Institutes if repute for Rehabilitation.

Recommended books:

1. Rehabilitation Medicine by Howard A Rusk.
2. Rehabilitation Medicine by Joel A De lisa
3. Text book of O.T – Pedretti
4. Normal Human Locomotion - Published by ALIMCO
5. Atlas of Prosthetics and Orthotics - ALIMCO

RESEARCH METHODOLOGY AND BIOSTATISTICS

Course Description

This course will introduce to the student the basic research methodology, statistical concepts:

methods of statistical analysis: and interpretation of data.

Subject Title	:	RESEARCH METHODOLOGY & BIostatistics
Duration	:	13 – 24 Months
Total Hours	:	30
Theory	:	30
Lecture	:	1 Hours / Week
Method of Assessment	:	Written

I. Research Methodology [15 Hrs]

1. Introduction to Research methodology: Meaning of research, objectives of research, Motivation in research, Types of research & research approaches, Research methods vs methodology, Criteria for good research, Problems encountered by researchers in India.
2. Research problem: Statement of research problem., Statement of purpose and objectives of research problem, Necessity of defining the problem
3. Research design: Meaning of research design, Need for research design, Features for good design, Different research designs, Basic principles of research design
4. Sampling Design: Criteria for selecting sampling procedure, Implications for sample design, steps in sampling design, characteristics of good sample design, Different types of sample design
5. Measurement & scaling techniques: Measurement in research- Measurement scales, sources of error in measurement, Technique of developing measurement tools, Meaning of scaling, its classification., Important scaling techniques.
6. Methods of data collection: collection of primary data, collection data through questionnaires & schedules, Difference between questionnaires & schedules.
7. Sampling fundamentals, need for sampling & some fundamental definitions, Important sampling distributions
8. Processing & analysis of data: Processing operations, problems in processing, Types of analysis, Statistics in research, Measures of central tendency, Dispersion, Asymmetry, relationship.

9. Testing of hypothesis: What is hypothesis? Basic concepts concerning testing of hypothesis, Procedure of hypothesis testing, measuring the power of hypothesis test, Tests of hypothesis, limitations of the tests of hypothesis 66
10. Computer technology: Introduction to Computers, computer application in research, computers & researcher.

III. Biostatistics [15 Hrs]

1. Introduction: Meaning, definition, characteristics of statistics., Importance of the study of statistics, Branches of statistics, Statistics and health science including physiotherapy, Parameters and Estimates, Descriptive and inferential statistics, Variables and their types, Measurement scales.
2. Tabulation of Data: Basic principles of graphical representation, Types of diagrams histograms, frequency polygons, smooth frequency polygon, cumulative frequency curve., Normal probability curve.
3. Measure of Central Tendency: Need for measures of central Tendency, Definition and calculation of mean – ungrouped and grouped, Meaning, interpretation and calculation of median ungrouped and grouped., Meaning and calculation of mode, Comparison of the mean, median and mode, Guidelines for the use of various measures of central tendency.
4. Probability and Standard Distributions: Meaning of probability of standard distribution, The binominal distribution, The normal distribution, Divergence from normality – skew ness, kurtosis.
5. Sampling techniques: Need for sampling - Criteria for good samples, Application of sampling in community, Procedures of sampling and sampling designs errors, Sampling variation and tests of significance.
6. Analysis of variance & covariance: Analysis of variance (ANOVA), what is ANOVA?s Basic principle of ANOVA, ANOVA technique, Analysis of Co variance (ANACOVA)

Recommended Textbooks:

1. *Elements of Health Statistics* by Rao.N.S.N
2. *An introduction of Biostatistics* by Sunder Rao.P.S.S.
3. *Methods in Bio-Statistics 6th Edn. 1997* by B.K. Mahajan
4. *Biostatistics : A manual of Statistics Methods* by K. Visweswara Rao
5. *Elementary Statistics 1st Edn, 1990. in Medical Workers* by Inderbir Singh
6. *Statistics in Psychology and education* by Great and Henry
7. *An Introduction to Gupta C.B. Statistical Methods, 1972* by Ram Prasad & Sons
8. *Basic Statistics, 3rd Edn* by Simpsory G. Kaftha. P
9. *Research; Principles and Methods* by L Denise F. Poli & Hungler
10. *Fundamentals of Research, 4th Edn.* By David J. fox

BPT IV YEAR**CLINICAL NEUROLOGY AND NEURO SURGERY****Subject Description**

The subject is to provide the knowledge about relevant aspects about neurological disorders and surgery. The student will have a general understanding of the diseases, The therapists would encounter in their practice .The objective of the course is that after specified hours of lectures and discussions the student will be able to list the etiology, pathology, clinical features and decide the Physiotherapy treatment methods for various neurological conditions

Subject Title	:	Clinical Neurology and Neuro Surgery
Duration	:	37-48 months
Total Hours	:	90
Theory	:	90 hours
Total Hours/ week	:	3 hours
Method of Assessment:		Written

Theory:

1. Basic Neuro Anatomy and Neurophysiology including Development of nervous system. **(5 hours)**
2. Clinical symptomatology in Neurology **(7 hours)**
 - a. Pain and Sensory symptoms
 - b. Motor
 - c. Symptoms from the special organs

- d. Higher brain functions
 - e. Autonomic Nervous System
 - f. Neurogenic Bladder and Bowel
3. Application of Neuro Physiology in clinical evaluation, investigations, differential diagnosis of Neurological conditions. **(10hours)**
4. Definitions, Etiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication and Medico – Surgical Management of

Pediatric Neurological Disorders (10Hours)

- a. Cerebral Palsy
 - b. Mental Retardation
 - c. Developmental Delay
 - d. Autism Spectrum Disorders
 - e. Down's syndrome
 - f. Spina Bifida
 - g. Hydrocephalus
 - h. Infantile Hemiplegic
 - i. Epilepsy
 - j. Poliomyelitis
 - k. Muscular Dystrophies
5. Definitions, Etiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication and Medico – Surgical Management of **Infections and Inflammation of the Nervous System (10Hours)**
- a. Meningitis
 - b. Encephalitis
 - c. Neuro Syphilis
 - d. Poliomyelitis
 - e. Peripheral Neuritis
 - f. Tetanus
 - g. Infective and Post Infective Neuropathies
 - h. Infective Myelopathies
 - i. Spinal Arachonditis

- j. Tabes Dorsalis
 - k. Transverse Myelitis
6. Definitions, Etiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication and Medico – Surgical Management of **Degenerative and Demyelination of CNS (10Hours)**
- a. Basal ganglia: Parkinsonism, Huntington Disease, Associated Dyskinesia, Dystonia, Rett's Syndrome etc
 - b. Cerebellar: Friedrich's and Cerebellar ataxia
 - c. Cerebrum: Alzheimer's Disease, Dementia, Multiple Sclerosis
 - d. Spinal Cord: Non compressive Myelopathy
 - e. Peripheral Nerve: Diabetic, Metabolic Neuropathies, NMJ disorders, Motor Neuron Disease
7. Definitions, Etiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication and Medico – Surgical Management of **Trauma of Nervous System (10 Hours)**
- a. Head Injury
 - b. Spinal Cord Injury
 - c. Peripheral Nerve Injury
8. Definitions, Etiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication and Medico – Surgical Management of **Compression of Nervous System (10Hours)**
- a. Brain Tumor
 - b. Cranio Vertebral Junction anomalies
 - c. Spinal Cord Tumor
 - d. Syringomyelia
 - e. Inter Vertebral Disc Prolapse
 - f. Tumors on the peripheral nervous system
 - g. Entrapment Neuropathies
9. Definitions, Etiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication

and Medico – Surgical Management of **Vascular Insult to Nervous System**

(10Hours)

- a. CVA
- b. Vertebral Stroke
- c. Moya Moya Disease
- d. VBI

10. Definitions, Etiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication and Medico – Surgical Management of Nervous system due to Toxic, Metabolic injuries and Nutritional disorders **(8 Hours)**

- a. Metabolic encephalopathies
- b. B12 Deficiency
- c. Alcohol related disorders
- d. Nutritional Polyneuropathies
- e. Neurolathyrism

Reference:

1. Victor Adams-neurology
2. Haerer: Neurological examinations
3. Davidson: Principle and practice in medicine
4. John Walton: Brains Diseases of the nervous system
5. Baily & Love : Short practice of surgery
6. Hutchisons clinical methods.
7. Neurological examination made easy

PHYSIOTHERAPY IN NEUROLOGY & NEURO SURGERY

Subject Description

The subject is designed to provide knowledge in assessment, diagnosis and planning physiotherapy interventions in various Neurological disorders and Neuro surgical conditions. The student must be able to assess the patient as necessary, to monitor the patient's vital signs, to monitor the patient in regard to treatment, and to independently provide appropriate interventions to patient considering current evidence based guidelines.

Subject	:	Physiotherapy in Neurology and neurosurgery
Duration	:	37-48 months
Total Hours	:	240
Theory	:	150 hours
Practical	:	90 hours
Total Hours per week	:	8 hours
Lecture	:	5 hours/week
Practical	:	3 hours/week
Method of Assessment:		Written, Oral, Practical

1. Introduction to Motor Control & Motor Learning, Introduction to Neural Plasticity **(15Hours)**

2. Introduction to various Neuro Developmental Approaches including Bobath, Roods, PNF, Brunstorm, MRP, CIMT, Muscle Strengthening Approach, Virtual Reality, Mental Imagery, Robotics, Body Weight Supported Treadmill Training Techniques, Sensory Integration, Biofeedback in Neuro Rehabilitation, FNMS, Sensory Reeducation etc **(35Hours)**.

3. Physiotherapy Evaluation including Neuro developmental Screening, differential diagnosis of Pediatric Nervous system and Practical application of various motor control theories in **(25Hours)**
 - a. Cerebral Palsy
 - b. Mental Retardation

- c. Autism Spectrum Disorders
- d. Down's syndrome
- e. Spina Bifida
- f. Hydrocephalus
- g. Infantile Hemiplegic
- h. Epilepsy
- i. Poliomyelitis
- j. Muscular Dystrophies

4. Physiotherapy Evaluation, outcome measurements, differential diagnosis, Investigations (including Radiodiagnosis, electro physiology, lab studies, non invasive procedures) of Nervous system Practical application of Physiotherapeutics in :

Inflammation of the Nervous System(10 hours)

- Meningitis
- Encephalitis
- Neuro Syphilis
- Poliomyelitis
- Perefheral Neuritis
- Tetanus
- Infective and Post Infective Neuropathies
- Infective Myelopathies
- Spinal Arachonditis
- Tabes Dosrsalis
- Transverse Myelitis

Degenerative and Demyelination of CNS(12 hours)

- Basal ganglia: Parkinsonism, Huntington Disease, Associated Dyskinesia, Dystonia, Rett's Syndrome etc
- Cerebellar: Friedrich's and Cerebellar ataxia
- Cerebrum: Alziemers Disease, Demetia, Multiple Sclerosis
- Spinal Cord: Non compressive Myelopathy

- Perefpheral Nerve: Diabetic, Metabolic Neuropathies, NMJ disorders, Motor Neuron Disease

Trauma of Nervous System(15 hours)

- Head Injury
- Spinal Cord Injury
- Perefpheral Nerve Injury

Compression of Nervous System(15 hours)

- Brain Tumor
- Cranio Vertebral Junction anomalies
- Spinal Cord Tumor
- Syringomyelia
- Inter Vertebral Disc Prolapse
- Tumors on the peripheral nervous system
- Entrapment Neuropathies

Vascular Insult to Nervous System(13 hours)

- CVA
- Vertebral Stroke
- Moya Moya Disease
- VBI

Toxic, Metabolic injuries and Nutritional disorders(5 hours)

- Metabolic encephalopathies
- B12 Deficiency
- Alcohol related disorders
- Nutritional Polyneuropathies
- Neurolathyrism

5. Practical application of Physiotherapeutics in Neurogenic Bowl and Bladder disorders (5 Hours)**PRACTICALS: 90 hours**

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

- Bedside case presentations and case discussions in the wards

- Demonstration of application of Neuro Physiotherapeutic techniques on patients in Physiotherapy O.P.D
- Participation under faculty guidance in management.
- Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

Reference:

1. 1.Patrica Downie: Cash's book of neurology.
2. 2.Ida Bromely : Tetraplegia & Paraplegia
3. Thomson – Tidy's Physiotherapy
4. Susan B O' Sullivan – Physical rehabilitation
5. Darcy Umphred – Neurological rehabilitation
6. Braddom – Physical medicine & rehabilitation
7. Swaner – Brunnstorms movement therapy
8. Berta Bobath – Adult hemiplegia
9. Robbert Carr & Shapperd – Motor relearning Programme
10. Robbert Carr & Shapperd- Neurological rehabilitation
11. Ecker- Elements of pediatric physiotherapy
12. Barbara- physiotherapy for cerebral palsy children.
13. Adal Cunning – Key Issues in neurological physiotherapy.
14. Physical management in neurological rehabilitation- Stokes M
15. Physical Therapy for Children- Campbell SK, Palisano RJ, Orlin M
16. Motor Control: Theory and Practical Applications- Anne Shumway-Cook ,
Marjorie H. Woollacott
17. Differential Diagnosis for Physical Therapists-Goodman & Snyder

CLINICAL CARDIO-RESPIRATORY DISORDERS & SURGERY

Subject Description

This subject follows the basic science subjects to provide the knowledge about relevant aspects about cardio-respiratory disorders and surgery. The student will have a general understanding of the diseases, that the therapist would encounter in their practice. The objective of the course is that after specified hours of lectures and discussion the student will be able to list the aetiology, pathology, clinical features and treatment methods for various cardio-respiratory conditions.

Subject Title	: CLINICAL CARDIO-RESPIRATORY DISORDERS & SURGERY
Duration	: 37 – 48 Months
Total Hours	: 90
Theory	: 90 Hours
Total Hours / Week	: 3Hours
Method of Assessment:	Written

Theory:

1. Cardiovascular Disease : Examination of the Cardiovascular System – Investigations : ECG, Exercise Stress Testing, Radiology ; Clinical manifestations of Cardiovascular disease ; Definition, Aetiology, Clinical features, signs and symptoms, complications, management and treatment of following diseases and disorders of the heart : Pericarditis, Myocarditis, Endocarditis, Rheumatic Fever – resulting in valve disorders, Mitral Stenosis & Insufficiency, Aortic Stenosis and Insufficiency, Cardiac tumors. [**10Hours**]
 2. Ischemic Heart Disease, Coronary Valve Disease, Congenital Heart diseases – Acyanotic congenital heart disease & Cyanotic congenital heart disease : Patent Ductus Arteriosus, Coarctation of Aorta, Atrial Septal Defect, Ventricular Septal Defect, Tetralogy of Fallot, Transposition of Great Vessels, Cardiac Arrest ; Examination and Investigations of diseases of arteries and veins ; Hypertension : Definition, causes, classification, types, assessment, investigations and management. [**12 Hours**]
 3. Respiratory Disease : Examination of the Respiratory System –Investigations: Chest Radiographs, Pulmonary Function Testing, Arterial Blood Gas Analysis ; Clinical manifestations of Lung disease ; Patterns of lung disease – Chronic Obstructive Lung Disease and Restrictive Lung Disease ; Definition, Etiology, Clinical features, signs and symptoms, complications, management and treatment of following lung diseases : Chronic Bronchitis, Emphysema, Asthma, Bronchiectasis, Cystic Fibrosis, Upper Respiratory Tract Infections, Pneumonia, Tuberculosis, Fungal Diseases, Interstitial Lung Diseases, Diseases of the pleura, diaphragm and chest wall, ARDS ; Respiratory failure – Definition, types, causes, clinical features, diagnosis and management. [**12 Hours**]
 4. Paediatrics: Respiratory conditions of childhood – causes, complications, clinical manifestations, diagnosis and treatment. [**5 Hours**]
1. Disorders of the Chest Wall, Lung and Mediastinum – Definition, Clinical features, diagnosis and choice of management for the following disorders – chest wall deformities, chest wall tumors, Pleural Effusion, Empyema Thoracis, Lung abscess, Bronchiectasis, Tuberculosis, Bronchogenic Carcinoma, Bronchial Adenomas, Metastatic tumors of the Lung, tracheal

Stenosis, Congenital tracheomalacia, Neoplasms of the trachea, Lesions of the Mediastinum. Carcinoma of the female breast. **[5 Hours]**

2. Causes, Clinical Presentation, Diagnosis and treatment of the following Thoracic Trauma situations – Airway obstruction, Pneumothorax, Hemothorax, Cardiac Tamponade, Tracheobronchial disruption, Aortic disruption, Diaphragmatic disruption, Esophageal disruption, Cardiac and Pulmonary Contusions. **[10 Hours]**
3. Reasons for Surgery; Types of anaesthesia and its effects on the patient ; Types of Incisions ; Clips Ligatures and Sutures ; General Thoracic Procedures – Radiologic Diagnostic procedures, Endoscopy – types, Biopsy – uses and types. Overview and Drainage systems and tubes used in Surgery. **[5Hours]**
4. Thoracic surgeries – Thoracotomy – Definition, Types of Incisions with emphasis to the site of insision, muscles cut and complications. Lung surgeries: Pnumonectomy, Lobectomy, segmentectomy – Indications, Physiological changes and Complications; Thoracoplasty, Pleurectomy, Pleurodesis and Decortication of the Lung. Cardiac surgeries – An overview of the Cardio-Pulmonary Bypass Machine – Extracardiac Operations, Closed Heart surgery, Open Heart surgery. Transplant Surgery – Heart, Lung and Kidney – Indications, Physiological changes and Complications. **[15 Hours]**
5. Occupational Lung diseases. **[2 Hours]**
6. Drug therapy – Drugs to prevent and treat inflammation, Drugs to treat Bronchospasm, Drugs to treat Breathlessness, Drugs to help sputum clearance, Drugs to inhibit coughing, Drugs to improve ventilation, Drugs to reduce pulmonary hypertension, Drug delivery doses, Inhalers and Nebulisers.**[2 Hour]**
7. Intensive and Emergency care: First Aid: Trauma – Accidents: explosions, riots, gunshots, burns, septicaemia, acute respiratory failure, pulmonary embolism/pulmonary oedema, cardiac failure/myocardial infarction, unconsciousness/coma, drug overdose, poisoning, tetanus, respiratory paralysis(polio – G. B. Syndrome). **[5 Hours]**
8. Cardio Pulmonary Resuscitation and Airway care. **[5 Hours]**
9. Mechanical ventilators and Medical gas therapy. **[2 Hours]**

Recommended books:

1. General Surgical Operations – by Kirk / Williamson
2. Surgery by Nan
3. Bailey and Love's – Short Practice of Surgery
4. Chest Disease by Crofton and Douglas.

5. Text book of Heart, Chest Vascular Disease for physiotherapists- Patrica A Downie, JP Bros.

**PHYSIOTHERAPY IN CARDIO-RESPIRATORY DISORDERS &
INTENSIVE CARE MANAGEMENT**

Subject Description

The subject is designed to provide knowledge in assessing and planning physiotherapy interventions for various cardio-respiratory disorders and surgical conditions. The student must be able to assess the patient as necessary, to monitor the patient's vital signs, to monitor the patient in regard to physiotherapy treatment, and to independently provide appropriate interventions to the patient considering current evidence based guidelines.

Subject Title	: PHYSIOTHERAPY IN CARDIO-RESPIRATORY DISORDERS & INTENSIVE CARE MANAGEMENT
Duration	: 37 – 48 Months
Total Hours	: 240
Theory	: 150 Hours
Practical	: 90 Hours
Total Hours / Week	: 8
Lecturer	: 5 Hours / Week
Practical	: 3 Hours / Week
Method of Assessment:	Written, Oral, Practical

Theory: 150 Hours

1. Bedside assessment of the patient – Adult & Paediatric [**10 Hours**]
2. Investigations and tests – Exercise tolerance Testing – Cardiac & Pulmonary, Radiographs, PFT, ABG, ECG, Haematological and Biochemical Tests [**12 Hours**]
3. Physiotherapy techniques to increase lung volume – Controlled mobilization, Positioning, Breathing exercise, Neurophysiological Facilitation of Respiration, Mechanical AIDS – Incentive Spirometry, CPAP, IPPB [**10 Hours**]

4. Physiotherapy techniques to decrease the work of breathing – Measures to optimize the balance between energy supply and demand, positioning, Breathing re-education – Breathing control techniques, Mechanical aids – IPPB, CPAP, BiPAP [**10Hours**]
5. Physiotherapy techniques to clear secretions – Hydration, Humidification & Nebulisation, Mobilisation and Breathing exercise, Postural Drainage, Manual techniques – Percussion, Vibration and Shaking, Rib Springing, ACBT, Autogenic Drainage, Mechanical aids – PEP, Flutter, IPPB, Facilitation of Cough and Huff, Suctioning [**12Hours**]
6. Neonatal and Paediatric Physiotherapy – Chest physiotherapy for children, The neonatal unit, Modifications chest physiotherapy for specific neonatal disorders, Emergencies in the neonatal unit [**7 Hours**]
7. Physiotherapy in Obstructive lung conditions [**10Hours**]
8. Physiotherapy in Restrictive lung conditions [**10 Hours**]
9. Physiotherapy for Peripheral vascular diseases [**3 Hours**]
10. Pulmonary Rehabilitation [**8 Hours**]
11. Physiotherapy following Lung surgeries [**6 Hours**]
12. Respiratory failure – Oxygen Therapy and Mechanical Ventilation [**5 Hours**]
13. Introduction to ICU : ICU monitoring – Apparatus including Mechanical Ventilators, Airways and Tubes used in the ICU, Physiotherapy in the ICU – Common conditions in the ICU – Tetanus, Head Injury, Lung Disease, Pulmonary Oedema, Multiple Organ Failure, Neuromuscular Disease, Smoke Inhalation, Poisoning, Aspiration, Near Drowning, ARDS, Shock; Dealing with emergency situation in the ICU [**10 Hours**]
14. Physiotherapy management following cardiac surgeries [**8 Hours**]
15. Cardiac Rehabilitation [**7 Hours**]
16. Home program and education of family members in patient care [**3 Hours**]
17. Treatment, Response to exercise and Implication of Physiotherapy in the following disease conditions: Hypertension, Diabetes, Renal Failure and Obesity. [**8 Hours**]
18. Health Fitness and Promotion: Fitness Evaluation, Analysis of Body Composition, Evaluation and Prescription of Exercise, Factors affecting exercise performance, Exercise Prescription for Specific groups : Elderly, Women and Children. [**5Hours**]

19. Cardio Pulmonary Resuscitation [**3 Hours**]

20. Applied Yoga in Cardio-respiratory conditions. [**3 Hours**]

Practical: 90 Hours

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

- Bedside case presentations and case discussions in the wards
- Demonstration of application of Neuro Physiotherapeutic techniques on patients in Physiotherapy O.P.D
- Participation under faculty guidance in management.
- Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

Recommended books:

1. Tidy's physiotherapy.
2. Cash's Text Book of Chest, Heart, Vascular Disorders for Physiotherapists.
3. The Brompton Guide to chest physiotherapy DU Gasket [Completed]
4. Physical Rehabilitation Assessment and Treatment – O'Sullivan Schmitz
5. Elements in Paediatric Physiotherapy – Pamela M Eckersley
6. Essentials of Cardio Pulmonary Physical Therapy by Hillegass and Sadowsky
7. Cardio pulmonary Symptoms in physical Therapy practice Cohen and Michel
8. Chest Physiotherapy in Intensive Care Unit by Mackenzi
9. Cash's Text book of General Medicine and Surgical conditions for Physiotherapists.
10. Cardiopulmonary Physical Therapy: a guide to practice- Irwin S, Techlin JS
11. Essentials of Cardiopulmonary Physical Therapy- Hillegass, Ellen

PHYSIOTHERAPY IN COMMUNITY HEALTH

Subject Description

The subject serves to integrate the knowledge gained by the students in community medicine and other areas, with physiotherapy skills to apply these in clinical situations of health and disease and its prevention.

The objective of the course is that after the specified hours of lectures and demonstrations the student will be able to identify physiotherapy methods to promote health, fitness and to prevent ill health, disabilities and dysfunctions due to various

disease conditions and plan, set, prescribe and implement treatment goals considering current evidence based guidelines.

Subject Title	:	PHYSIOTHERAPY IN COMMUNITY HEALTH
Duration	:	37 – 48 Months
Total Hours	:	240
Theory	:	150 Hours
Practical	:	90 Hours
Total Hours / Week	:	8
Lecturer	:	5 Hours / Week
Practical	:	3 Hours / Week
Method of Assessment:		Written, Oral, Practical

1] Concepts of community health [preventive, promotive, restorative and rehabilitative] **[5Hour]**

2] Principles of Community based Rehabilitation.:- WHO definition of health and disease, Health delivery system – strategies of 3 tier health delivery system, Disability types (Physical & Psychological) , evaluation, prevention & Legislation related to Persons With Disability (PWD) **[10 hours]**

3] Introduction to CBR – definition, principles, types {institutional, reach out and community), concepts, WHO policies, principles of Team work of medical practitioner, Physiotherapist, Occupational Therapist, Speech & Audiology Therapist, Prosthetist & Orthotist, Clinical psychologist, vocational counsellor and social worker, Role of PT in team, concept of multi –purpose health worker. **[10 hours]**

4] Role of Physiotherapy in CBR: Screening for disabilities, Prescribing exercise programme, Prescribing and devising low cost locally available assistive aids, Modifications physical and architectural barriers for disabled, Disability prevention, Strategies to improve ADL, Rehabilitation programmes for various neuromusculoskeletal and cardiothoracic disabilities. **[10 hours]**

5] Communication Strategies. National District level rehabilitation Programmes [**15 Hours**]

6] Community Health Care – [**30 Hours**]

Prevention, Promotion & Restoration

I. In Peri Pubertal age group

II. In women-pregnancy, menopause

III. Neuromusculoskeletal, Cardiovascular, Pulmonary, metabolic and degenerative conditions

IV. In Obese / Over weight

V. In Cardiovascular conditions

VI. In Diabetes

VII. In Sport Person (Identify risk factor & type of training)

VIII. Health Promotion for All

7] Woman and child care – [**30 Hours**]

I. Antenatal exercises , Specific Breathing exercises, Relaxation, Postural Training, Pelvic floor stretching and strengthening exercises with clinical reasoning

II. Physiotherapy during labour

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. 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. Active aging and Aging with disabilities – WHO, Care for People with Dementias [**20 hours**]

9] Industrial health and Occupational Diseases– [**15 hours**]

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. Physical agents e.g. heat / cold, light, noise, vibration, UV radiation, ionizing
radiation

B. 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. 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

10] Vocational training in rehabilitation: Introduction, Need, Vocational evaluation,
Vocational rehabilitation services [5 hours]

Practical: 90 Hours

Project – Survey/Retrospective study in community

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

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

Textbooks/ Reference Books:

1. Industrial Therapy – Glenda Key
2. Geriatric Physical therapy - Andrew Guccione
3. ACSM (set of 3 books)
4. P.S.M. - Park
5. Textbook of Women’s Health – Ruth Sapsford
6. Legal Rights of Disabled – RCI
7. Physiotherapy in obstetrics & Gynecology -J. Mantle
8. Textbook of Work Physiology – Astrand
9. Exercise Physiology - Mc Ardle
10. Ergonomics: Man in working environment – Mural
11. Ergonomics- Karen Jacobs
12. Occupational injuries – Herrington
13. Musculoskeletal disorders in the work place – Nordin
14. Textbook of preventive & Social Med – Gupta & Mahajan
15. Exercise testing & Exercise prescription for special cases - J. Skinner
16. Sports Injuries - Zuluaga
17. Rehab Medicine-Part I/II – Delisa

ETHICS&MANAGEMENT

Subject Title	:	ETHICS & MANAGEMENT
Duration	:	37 – 48 Months
Total Hours	:	20
Theory / Lecture	:	1 Hour / Week
Method of Assessment:		Written

ETHICS

1. History of physiotherapy, Ethical principles in health care, Ethical principles related to physiotherapy, Scope of practice, Enforcing standards in health profession-promoting quality care, Professional ethics in research, education and patient care delivery, Informed consent issues, Medical ethics and Economics in clinical decision-making. [**3 hours**]
2. Rules of professional conduct [**3hours**]

- Physiotherapy as a profession
- Relationship with patients
- Relationship with health care institutions
- Relationship with colleagues and peers
- Relationship with medical and other professional.

3. Confidentiality and Responsibility, Malpractice and negligence, Provision of services and, advertising, Legal aspects: Consumer protection act, Legal responsibility of physiotherapist for their action in professional context and understanding liability and obligations in case of medico-legal action [**2 hours**]

IAP, CSP, APTA, WCPT– Aims Objectives and Methods of functioning for the betterment of Physiotherapy Profession [**2 hours**]

MANAGEMENT

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 [4 hours]

2].Public relations in hospital and human resource management. [3 hours]

3] Planning and implementation of commercial projects [3 hours]

Recommended books:

1. Medical Ethics by C M Francis.
2. George V Lobo – Current Problems in Medical Ethics
3. Consumer Protection Act – 1986, Government of India, New Delhi.
4. Francis C M – Hospital Administration
5. Davies, R and Macaulay, BMC – Hospital Planning and Administration
6. Health Services Management, Analysis & Application , Wadsworth Publishing Company,
Belmont
7. Management principals and application for physiotherapists.

PROJECT

Subject Title	:	PROJECT
Duration	:	37 – 48 Months
Total Hours	:	-
Method of Assessment:		Oral, Practical

Project, submitted by the candidate will be verified and a viva will be conducted. The project will be a clinical assignment on given topic or condition. This may be done in the form of a literature review. This will give the student a background on research methods and recent advances.
