

**KERALA UNIVERSITY OF HEALTH
AND ALLIED SCIENCES (KUHAS)**

B.P.T SYLLABUS

BACHELOR OF PHYSIOTHERAPY (B.P.T)
Regulation and Curriculum - 2011
4½ year Degree Course

CONTENTS

	PARTICULARS	
SECTION -1	Aims and objectives of the course	
SECTION -2	Regulations governing BPT course	
1	Minimum qualification for the admission of the course	
2	Duration of the course and period of the completion	
3	Medium of instruction and examinations	
4	Attendance and progress and condonation	
5	Internal assessment marks	
6	Course of study	
7	Schedule of examination	
8	Scheme of examination	
9	Criteria of pass	
10	Conditions under which candidates are permitted to proceed to other next higher class	
11	Declaration of the class	
12	Internship	
13	Award of rank	
14	Award of Degree	
15	Migration and transfer	
SECTION 3	Subject and Course Content	
	First Year BPT	
	Anatomy	
	Physiology	
	Biochemistry and Nutrition	
	Psychology	
	Sociology	
	First Aid & Nursing	
	Orientation to Physiotherapy	

	Communicative English	
	Computer Sciences	
	Second year BPT	
	Biomechanics	
	Electrotherapy	
	Exercisetherapy	
	Pharmacology	
	Microbiology	
	Pathology	
	Bio Statistics and Research Methodology	
	Clinical observation	
	Third year BPT	
	General Medicine and general Surgery	
	Physiotherapy in General Medicine and General Surgery	
	Clinical Orthopedics and Sports Medicine	
	Physiotherapy in Orthopedics and sports	
	Rehabilitation and Bio Engineering	
	Fourth year BPT	
	Clinical Neurology and Neuro Surgery	
	Physiotherapy in Neurology and Neuro surgery	
	Clinical Cardio respiratory disorder and surgery	
	Physiotherapy in Cardio respiratory disorder and intensive care management	
	Community based rehabilitation	
	Ethics administration and supervision	
	Project	

SECTION – 1

AIMS AND OBJECTIVES OF THE COURSE

An under graduate course in physiotherapy 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 practice of physiotherapy and carry out treatment.

OBJECTIVE OF THE STUDY

- Acquire adequate knowledge of the basic medical subjects in the practice of physiotherapy.
- Develop skills and techniques of exercise therapy, electro therapy and manual therapy for the management of various medical and surgical conditions.
- Development of proper attitude for compassion and concern for the individuals and welfare of the physically handicapped in the community.
- Demonstrate skills in teaching, management, research, guidance and counseling.
- Practice moral and ethical values.

SECTION -2
REGULATIONS GOVERNING BPT DEGREE COURSE

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, biology together are eligible.

2. Duration of the course and period of completion

The duration of the course shall be four and half years including 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.

3. Medium of instruction and examinations

Medium of instruction and examinations shall be in English.

4. Attendance, progress and condonation

A candidates 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 including internship

The candidate shall complete the prescribed course satisfactorily to be eligible to appear for the respective examination.

Condonation of attendance shall be done by the principal in consultation with the college governing council if any. Maximum 10% attendance for a subject once in a course and for one time only.

5. Internal assessment marks

Three internal examinations shall be conducted in each subject during a year and average marks of two performances shall be taken into consideration for the award of sessional marks.

A candidate must obtain 40% of marks in internal assessment to be eligible to write the university examination.

Class average of internal assessment marks should not cross 75%

5. Course of study

TABLE – 1

FIRST YEAR BPT (DURATION 0 – 12 MONTHS)							
Sl. No:	Subject	Teaching hours					
		Weekly class hrs.	Total	Theory	Practical	Clinics	
Main subjects: For University Examination						-	
1.	Anatomy	8	240	150	90		
2.	Physiology	8	240	150	90		
3.	Biochemistry& Nutrition	5	150	120	30		
4.	Section A – Psychology	3		180	90		-
	Section B – Sociology	3			90		-
Subsidiary subjects: Not for University Examination							
5.	First Aid & Nursing	2	60	30	30		
6.	Orientation to Physiotherapy	2	60	60			
7.	Communicative English	3	90	90	-		
8.	Computer Science	2	60	30	30		
				-	-		
	Total	36					

TABLE – II

SECOND YEAR BPT (DURATION 13 – 24 MONTHS)						
Sl. No:	Subject	Teaching hours				
		Weekly class hrs.	Total	Theory	Practical	Clinics
Main subjects: For University Examination						-
1.	Biomechanics	5	150	100	50	
2.	Electrotherapy	8	240	120	120	
3.	Exercise therapy	8	240	120	120	
4.	Pharmacology	3	90	90	-	
5.	Section A – Microbiology	2	120	45	15	
	Section B - Pathology	2		45	15	
Subsidiary subjects: Not for University Examination						
6.	Research methodology&biostatistics	1	30	-	-	
7.	Clinical observation	7	210	-	-	
	Total	36				

TABLE – III

THIRD YEAR BPT (DURATION 25 – 36 MONTHS)						
Sl. No:	Subject	Teaching hours				
		Weekly class hrs.	Total	Theory	Practical	Clinics
Main subjects: For University Examination						540
1.	General Medicine & General Surgery	3	90	90	-	
2.	Physiotherapy in General Medicine & General Surgery	5	150	90	60	
3.	Clinical Orthopedics & Sports Medicine	2	60	60	-	
4.	Physiotherapy in Orthopedics & Sports	5	150	90	60	
5.	Rehabilitation & Bio-Engineering	3	90	60	30	
	Total	18	540			

TABLE – IV

FORTH YEAR BPT (DURATION 37– 48 MONTHS)						
Sl. No:	Subject	Teaching hours				
		Weekly class hrs.	Total	Theory	Practical	Clinics
Main subjects: For University Examination						540
1.	Clinical Neurology & Neurosurgery	2	60	60	-	
2.	Physiotherapy in Neurology & Neurosurgery	4	120	80	40	
3.	Clinical Cardio-Respiratory disorders & Surgery	2	60	60	-	
4.	Physiotherapy in Cardio-Respiratory disorders & Intensive Care management	4	120	80	40	
5.	Community Based Rehabilitation	4	120	80	40	
Subsidiary subjects: Not for University Examination						
6.	Ethics , Administration & Supervision	1	30	30	-	
7.	Project	1	30			
	Total	18	540			

7. Schedule of the examination

There will be two examinations in a year, 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. The particulars of the subjects for various examinations and distributions of marks are shown separately in the scheme of examination.

8. Scheme of examinations

Subjects and distribution of marks

SCHEME OF EXAMINATION

Ist Year BPT

SL. No.	Subject	Section	Sessional Mark		University Mark		Passing Minimum	Theory Duration	Grand Total For The Subject	
			Maximum	Passing Minimum	Maximum	Passing Minimum			Maximum	Passing Minimum
1	Anatomy	Theory	20	8	100	50	60	3 hr	200	100
		Oral	-	-	30	-	-	-		
		Practical	-	-	50	25	25	-		
2	Physiology	Theory	20	8	100	50	60	3 hr	200	100
		Oral	-	-	30	-	-	-		
		Practical	-	-	50	25	25	-		
3	Bio Chemistry Nutrition	Theory	20	8	100	50	60	3 hr	120	60
		Oral	-	-	-	-	-	-		
		Practical	-	-	-	-	-	-		
4	Section-4 Psychology	Theory	10	4	50	25	60	3 hr	120	60
		Oral	-	-	-	-				
		Practical	-	-	-	-				
	Section-B Sociology	Theory	10	4	50	25				
		Oral	-	-	-	-				
		Practical	-	-	-	-				

SCHEME OF EXAMINATION
IInd Year BPT

SL · No ·	Subject	Section	Sessional Mark		University Mark		Passing Minimum	Theory Durati on	Grand Total For The Subject	
			Maximu m	Passing minimu m	Maximu m	Passing Minimu m			Maximu m	Passing Minimum
1	Biomechanics	Theory	20	8	100	50	60	3 hr	120	60
		Oral	-	-	-	-	-	-		
		Practical	-	-	-	-	-	-		
2	Electro Therapy	Theory	20	8	100	50	60	3 hr	250	125
		Oral	-	-	30	-	-	-		
		Practical	20	8	80	40	50	-		
3	Exercise Therapy	Theory	20	8	100	50	60	3 hr	250	125
		Oral	-	-	30	-	-	-		
		Practical	20	8	80	40	50	-		
4	Section A Micro Biology	Theory	10	4	50	25	60	3 hr	120	60
		Oral	-	-	-	-				
		Practical	-	-	-	-				
	Section B Pathology	Theory	10	4	50	25				
		Oral	-	-	-	-				
		Practical	-	-	-	-				

SCHEME OF EXAMINATION

IIIrd Year BPT

SL. No.	Subject	Section	Sessional Mark		University Mark		Passing Minimum	Theory Duration	Grand Total For The Subject	
			Maximum	Passing Minimum	Maximum	Passing Minimum			Maximum	Passing Minimum
1	General Medicine & General Surgery	Theory	20	8	100	50	60	3 hr	120	60
		Oral	-	-	-	-	-	-		
		Practical	-	-	-	-	-	-		
2	Physiotherapy in General Medicine & General Surgery	Theory	20	8	100	50	60	3 hr	250	125
		Oral	-	-	30	-	-	-		
		Practical	20	8	80	40	50	-		
3	Clinical orthopedics & Sports Medicine	Theory	20	8	100	50	60	3 hr	120	60
		Oral	-	-	-	-	-	-		
		Practical	-	-	-	-	-	-		
4	Physiotherapy in Orthopedics & Sports	Theory	20	8	100	50	60	3 hr	250	125
		Oral	-	-	30	-	-	-		
		Practical	20	8	80	40	50	-		
5	Rehabilitation&Bio-Engineering	Theory	20	8	100	50	60	3 hr	120	60
		Oral	-	-	-	-	-	-		
		Practical	-	-	-	-	-	-		

SCHEME OF EXAMINATION

IVth Year BPT

SL. No.	Subject	Section	Sessional Mark		University Mark		Passing Minimum	Theory Duration	Grand Total For The Subject	
			Maximum	Passing Minimum	Maximum	Passing Minimum			Maximum	Passing Minimum
1	Clinical Neurology & Neurosurgery	Theory	20	8	100	50	60	3 hr	120	60
		Oral	-	-	-	-	-	-		
		Practical	-	-	-	-	-	-		
2	Physio Therapy in Clinical Neurology & Neurosurgery	Theory	20	8	100	50	60	3 hr	250	125
		Oral	-	-	30	-	-	-		
		Practical	20	8	80	40	50	-		
3	Clinical Cardio Respiratory Disorders and surgery	Theory	20	8	100	50	60	3 hr	120	60
		Oral	-	-	-	-	-	-		
		Practical	-	-	-	-	-	-		
4	Physiotherapy in Cardio-Respiratory and intensive care management	Theory	20	8	100	50	60	3 hr	250	125
		Oral	-	-	30	-	-	-		
		Practical	20	8	80	40	50	-		
5	Community Based Rehabilitation	Theory	20	8	100	50	60	3 hr	250	125
		Oral	-	-	30	-	-	-		
		Practical	20	8	80	40	50	-		

Sample Question Paper for BPT course – Directions

Total Marks - 100, Time : 3Hrs

Q1. Essays	-	2Nos	2x10	=	20 Marks
Q2. Short Answers	-	10Nos	10x5	=	50 Marks
Q3. Short Notes	-	10Nos	10x3	=	30 Marks
Total			-	=	100 Marks

9. Criteria for pass

Candidates who have secured a minimum of 50% marks in theory and practical separately in any subjects, the same examination shall be declared to have passed in that subject.

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

A candidate is not permitted to attend the second year examinations unless he/she clears the entire first year subjects. He/she is not permitted to appear the final year examination (IVth year) unless he/she clears all Ist, IInd and IIIrd year subjects.

11. Declaration of class

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

- A. Distinction – 75% and above
- B. First class - 60% and above and less than 75%
- C. 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

12. Internship

Every candidate admitted BPT degree course shall undergo six months of the compulsory internship after successful completion as prescribed by the institution after successful completion of the final examinations.

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

The internship should be in rotatory and cover clinical branches concerned with physiotherapy such as Orthopedics, cardiothoracic including ICU, neurology and neuro-surgery, pediatrics, general medicine, general surgery, OBG.

The six months of rotational posting must be covered in the following pattern

- | | |
|---|-----------|
| 1. Physiotherapy OPD (Including pediatrics and OBG ward) | - 1 month |
| 2. Orthopaedic ward | - 1 month |
| 3. General medicine wards including (MICU&CCU) | - 1 month |
| 4. General surgery wards including CTS Wards CTS- ICU, Burns) | - 1 month |
| 5. Neurology and neurosurgery wards (including neuro ICU) | - 1 month |
| 6. Community posting –PHC | - 1 month |

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 six posting, the duly completed log book will be submitted to the principal/Head of the programme to be considered as having successfully completed the internship programme.

13. 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.

14. Award of degree

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

15. 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.

SECTION -3

Subject and course content of the whole course

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 paid 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

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, lymphoid tissue, Skin and its appendages.

2. Embryology

- a. Ovum, Spermatozoa fertilization and formation of the Germ layers and their derivations (brief outline).

- b. Development of skin, Fascia, blood vessels, lymphatic(brief outline).
- c. Development of bones, axial and appendicular skeleton and muscles,
- d. Neural tube, brain vessels and spinal cord,
- e. Development of brain and brain stem structures.

3. *Regional Anatomy*

Thorax:

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:

- 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:

- 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):

- 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)

- 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, synovial 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 :

- 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 palmar arches of hand, skin of the palm and dorsum of hand.
- e. Applied/Clinical anatomy related to the above topics.

6. Lower Extremity :

- 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

- 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.
 - 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.
 - c. Pelvic girdle and muscles of the pelvic floor
 - e. Applied/clinical related to Anatomy above topics.

8. Neuro Anatomy

- 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
 - 1. 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

List of Practical / Demonstrations *

Topics

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
5. Histology-Elementary tissue including surface Anatomy
6. Embryology-models, charts & X-rays
 - 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 nerves and arteries.

Recommended Text books:

1. SNELL [Richard S], Clinical Anatomy for Medical students : Ed. 5. Little Brown and Company Boston. 1995,p898, \$26.50
2. B.D CHAURASIA'S HUMAN ANATOMY -REGIONAL AND APPLIED;
VOLUME 1,VOLUME II AND VOLUME III.
3. MOORIE [Kieth L], Clinically Oriented Anatomy. Ed. 3., Williams and Wilkins, Baltimore, 1992, p917,\$30
4. DATTA [A.K], Essentials of human Anatomy: Thorax and Abdomen Ed 2. Vol. I Current. Book International, Calcutta 1994, p433, Rs. 200/-DATTA..K.J, Essentials of human Anatomy: Head and Neck Ed 2. Vol. II, Current Book International, Calcutta 1995, p363, Rs. 200/-
5. SINGH [Inderbir], Text book of anatomy with color atlas: Introduction, Osteology, upper extremity, lower extremity. Vol I. P Brothers, New Delhi 1996, Rs. 200/-

6. SINGH [Inderbir], Text book of anatomy with colour atlas: Thorax and abdomen. Vol II. JP Brothers, New Delhi 1996, Rs. 175/-
7. SINGH [Inderbir], Text book of anatomy with color atlas: Head and Neck Central Nervous system. Vol III. JP Brothers, New Delhi 1996, Rs. 175/-
8. SINGH [Inderbir], Human Osteology. JP Brothers, New Delhi 1990, p191. Rs. 50/-
9. Susan standing YRAY'S Anatomy. The Anatomical basis of clinical practice, 39th (2005), 40th (2008) Edition Church II Livingstone.
10. Drake, Vogl & Mitinell, YRAY'S Anatomy for students, 2nd Edition, 2010 Church II Livingstone.
11. SNELL, Clinical Neuro Anatomy, 7th edition 2010 Lippincott Williams & Wilkins.
12. SNELL, Clinical Anatomy, 7th edition 2004 Lippincott, Williams & Wilkins.

Practical

1. ROMANES [G J], **Cunningham manual of practical anatomy**: upper and lower limb ed 15 Vol 1 Oxford Medical Publication, Oxford 1996, P263, Rs. 32 5/-
2. ROMANES [G J], **Cunningham manual of practical anatomy** : Thorax and abdomen ed 15 Vol II Oxford Medical Publication, Oxford 1996, P298, Rs. 325/-
3. ROMANES [G J], **Cunningham manual of practical anatomy** : Head and Neck and Brained 15 Vol II Oxford Medical Publication, Oxford 1996, P346, Rs. 325/-.
4. AGGR, DALLEY, Grant's atlas of anatomy 2nd edition 2005, Lippincott, Williams & Wilkins.
5. NETTER, Atlas of Human Anatomy 3rd edition 2003, ICON Learning Systems.

PHYSIOLOGY

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

Course Description

The course in Physiology over the first year is designed to give the student an in-depth knowledge of fundamental reactions of living organisms, particularly in the human body.

The major topics covered include the following: the cell; primary tissue; connective tissue; skin; muscle; nervous tissue; blood; lymphoid tissues; respiration; blood vessels; circulation; cardiac cycle; systemic circulation; sensory receptors; special senses; motor unit; spinal cord; control of movement; hypothalamic functions; gastrointestinal tract; kidneys; uterus; urinary tract; pregnancy; endocrine system.

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

THEORY

General Physiology

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

Blood

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 - Anemia (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

- 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

- 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.
- Cardiovascular changes during exercise.

Respiratory System

- 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
- Respiratory changes during exercise.

Digestive System

- 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

- 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. Creatinine clearance.
- Tubular Reabsorption: Reabsorption of Na^+ , glucose,, HCO_3^- . Urea and water. Filtered load Renal tubular transport maximum. Glucose clearance. TmG .Renal threshold for glucose.
- Tubular Secretion: Secretion of, H^+ and K^+ , PAH Clearance.
- Mechanism of concentrating and diluting the Urine. Counter-current mechanism.
- Micturition: Mechanism of micturition. Cystometrogram. Atonic bladder, automatic bladder.
- Acid – Base balance (very brief)
- Artificial Kidney: Principle of heamodialysis.
- Skin and temperature regulation.

Endocrine System

- 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.
- Pituitary-Hypothalamic Relationship.
- 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 glucagon, Glucose metabolism and its regulation. Disorder: Diabetes mellitus.
- Calcitonin, Thymus and Pineal gland (very brief)

Reproductive System

- 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

- 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

- 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. UMNL and LMNL
- 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

A. Effects of acute and chronic exercise 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. Physiology of Aging

Applied Physiology

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

I. Haematology

To be done by the students

1. Study of Microscope and its uses
2. Determination of RBC count
3. Determination of WBC count

4. Differential leukocyte count
5. Estimation of hemoglobin
6. Calculation of blood indices
7. Determination of blood groups
8. Determination of bleeding time
9. Determination of clotting time

Demonstrations only

1. Determination of ESR
2. Determination of PC V

II. Clinical Examination

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
8. Examination of cranial nerves

III. Recommended Demonstrations

1. Spirometry
2. Artificial Respiration
3. ECG
4. Perimetry
5. Mosso's Ergometry

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:

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

BIOCHEMISTRY AND NUTRITION

Subject	:	Biochemistry and Nutrition
Duration	:	0 – 12 months
Total hours	:	150
Theory	:	120
Practical	:	30
Total hours/ week	:	5 hours

Course Description

At the completion of this course the student will have a basic knowledge about the importance of subject and how it is related to our field of study.

THEORY

1. CELL

Structure and functions of cell, cellular organelles. Structure and functions of biomembranes.

2. CARBOHYDRATES

Classification - Monosacharides – glucose, fructose, galactose, mannose. Reactions - reducing property, oxidation, reduction, furfurals, osazone . Isomers, anomers and epimers. Derivatives like aminosugars and deoxy sugars. Glycosidic bond.

Disacharides – lactose, sucrose, maltose.

Polysaccharides – starch, glycogen, dextrans , use of dextrans as plasma expanders, blood group antigens. Glycosaminoglycans (basic structural features and functions), Mucopolysaccharidoses.

3. PROTEINS

Amino acids - classifications based on structure, polarity. Important biochemical properties- ionic properties of amino acids, iso-electric pH, buffering action of amino acids and proteins, biologically important peptides .

Classification of proteins. Denaturation, Coagulation, isoelectric precipitation, Precipitation using salt solutions, Structural organization of proteins.

4. LIPIDS

Definition, Classification with examples, saturated and unsaturated fatty acids, , PUFA including essential fatty acids and omega 3 fatty acid, triacylglycerols.

Phospholipids – classification, structure and functions. Structure and function of biomembrane.

5. ENZYMES

Nature of enzymes, Coenzymes & cofactors, Classification, Mechanism of enzyme action, active site, specificity. Enzyme kinetics and their clinical applications, Factors affecting enzyme activity, Km value and its significance(derivation not required) .Types of enzyme inhibition - competitive, non competitive, uncompetitive, suicidal, allosteric , feedback inhibition,. Enzyme regulation in biological systems – allosteric regulation, covalent modification, zymogen activation, induction and repression.

Clinical enzymology – functional and non functional enzymes, Isoenzymes. Diagnostic importance of enzymes – LDH, CPK, AST, ALT, ALP, GGT, NTP, GPD, cholinesterase, amylase, lipase. Cardiac markers.

6. DIGESTION AND ABSORPTION OF NUTRIENTS

Digestion and absorption of carbohydrates , Glucose transporters. Disorders associated .

Digestion and absorption of lipids. Malabsorption syndrome.

Digestion and absorption of proteins, nitrogen balance, PEM.

7. METABOLISM OF CARBOHYDRATES

EMP Pathway - reactions, regulation in brief, Energetics Rappaport - Leubering cycle, Fate of pyruvate in aerobic anaerobic conditions, PDH reaction. Gluconeogenesis, key enzymes, regulation and significance, Cori cycle Glycogenesis, glycogenolysis, regulation in brief, inborn errors associated. HMP Shunt pathway, functional significance of HMP shunt (non-oxidative phase need not be elaborated). NADPH generation, Transketolase reaction, G6PD deficiency, Uronic acid pathway, Metabolism of galactose, fructose, polyol pathway, inborn errors associated.

Regulation of Blood Glucose level. Action of insulin, receptors, glucagon, cortisol, growth hormone, adaptation during fed state, fasting state. & In starvation. Diabetes mellitus, aetiology, biochemical abnormalities symptoms & biochemical basis of complications (acute in detail and chronic in brief), Lab diagnosis and monitoring of Diabetes mellitus, microalbuminuria, Glycated hemoglobin.

Metabolic syndrome - Insulin resistance. Glycosurias and reducing substances GTT-procedure, criteria of normal and diabetic status, interpretation of graph.

8. METABOLISM OF LIPIDS

Fatty acid oxidation- beta oxidation, transport of fatty acids across mitochondrial membrane, regulation, energetics, alpha oxidation - points only, Refsum's disease, Zellwegers syndrome. Oxidation of odd chain fatty acid (need not be elaborated), fate of propionyl Co A. Synthesis of fatty acids, fatty acid synthase complex, regulation, elongation and desaturation. Formation and utilization of ketone bodies, ketoacidosis, in diabetes and starvation. Metabolism of adipose tissue, hormone sensitive lipase, action of hormones insulin, glucagon, epinephrine and cortisol. Liver - adipose tissue axis, Fatty liver and lipotropic factors, obesity, metabolic syndrome in brief.

Structure, synthesis of cholesterol upto mevalonate in detail then mention the intermediates with basic chemical changes, regulation, metabolic fate, bile acids formation, bile salts, steroid hormones.

Transport of plasma lipids, Lipoproteins - classification, metabolism, functions and disorders – dyslipidaemias, atherosclerosis, biochemical basis of management of hyper lipidaemia – diet and drugs, lipid profile.

Phospholipids and sphingolipids – inborn errors.

Eicosanoids - Prostaglandins, thromboxanes and Leukotrienes - formation (major steps only), biochemical actions.

9. METABOLISM OF AMINOACIDS

Body amino acid pool, dynamic state of body proteins, inter organ transport of amino acids , glucogenic and ketogenic amino acids. Reactions - Transamination, decarboxylation, oxidative deamination, transdeamination, formation and detoxification of ammonia, urea cycle, regulation and energetics, hyperammonemias - acquired and congenital.

Metabolism of glycine, compounds synthesized, Inborn errors associated.

Metabolism of sulphur containing aminoacids - methionine and cysteine, transsulphuration, transmethylation, formation of taurine, PAPS, excretion of sulphur, inborn errors associated.

Phenylalanine and tyrosine metabolism, compounds synthesized, inborn errors associated and VMA Tryptophan- metabolism, compound synthesized and inborn errors associated, Hartnups disease, 5HIAA & carcinoid syndrome.

Histidine - metabolism and inborn errors

Glutamic acid, GABA, Glutamine, asparagine, Aspartic acid- serine, threonine, arginine, NO and polyamines (synthesis and function), Branched chain aminoacids- MSUD (pathway not required).

Biologically important amines, organic acidurias.

10. TCA CYCLE AND ETC

Reactions, regulation, energetics, and significance, Inter relationship of carbohydrate, lipid, amino acid metabolism. Anaplerotic reactions, Amphibolic role , Metabolic adaptation during fed state and starvation.

Electron transport system - components and site of ATP Synthesis, Mechanism of Oxidative Phosphorylation . ATP Synthase, uncouplers and inhibitors , brown adipose tissue .

11. VITAMINS

Classification of vitamins. Chemical nature, (detailed structure not required). Dietary sources, coenzyme form biochemical role, deficiency manifestations, daily requirement and toxicity of following vitamins- Vitamin A, D, K ,E,B Complex and Ascorbic acid . Anti vitamins.

12. MINERAL METABOLISM

Classification, Dietary sources, requirements absorption, biochemical role, deficiency and toxicity of the following minerals : Calcium and phosphorus - role of PTH, 1, 25- DHCC and calcitonin. Iron – metabolism and disorders. Copper, Magnesium, Zinc, Iodine, Fluoride, Selenium, Manganese, Sodium, Potassium and Chloride.

13. XENOBIOTICS

Biochemical basis of environmental health & environmental toxicology, mechanism of detoxification and role of cytochrome p450. Deleterious effects of smoking , alcohol metabolism, free radicals free radical scavenging system, lipid peroxidation, antioxidants.

14. MAINTENANCE OF HOMEOSTASIS

Acid base regulation: pH, Acids, Bases, Buffers, Henderson - Hasselbalch Equation in relation to body systems (derivation not required), buffer capacity. Body buffers, Role of kidneys and lungs in Acid - base homeostasis. Acid base disorders- causes, compensatory mechanisms, anion gap, assessment of acid base status.

Fluid and electrolyte balance – distribution of body water and disorders (hormonal regulation not in detail).

15. **NUCLEIC ACID CHEMISTRY**

Structure of purines, pyrimidines, nucleosides, nucleotides. Nucleic acids: structure and organization of DNA, different types of DNA, mitochondrial DNA, base pairing rule, differences between DNA and RNA, different types of RNA.

16. **CLINICAL CHEMISTRY**

1. **Liver function tests**- Common tests performed serum bilirubin, enzymes, A/G ratio, BSP test, urine tests and interpretation of laboratory reports.
2. **Thyroid function test** and interpretation.
3. **Renal function tests** - BUN, NPN, Clearance test, tests of tubular function urine analysis and clinical interpretation of laboratory reports, newer renal markers – Cystatin C.
4. **Procedures in Biochemistry** – Electrophoresis and chromatography – briefly mention on separation techniques, Flame photometry, RIA, ELISA. Principles of colorimetry.
5. **Radioactivity** – diagnostic, research & therapeutic applications. Radiation hazards.

17. **NUTRITION**

Introduction to nutrition, History, Role of nutrition in maintaining health. Nutritional problems in India. National Nutritional policy. Factors affecting food and nutrition: socio - economic, cultural, tradition, production, system of distribution, life style and food habits etc. Role of food and its medicinal value. 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).

Carbohydrates : Caloric Value, Recommended daily allowances. Dietary sources. Functions.

Malnutrition: Deficiencies and Over consumption.

Fats: Caloric Value, Recommended daily allowance. Dietary sources, Functions. Malnutrition: Deficiencies and Over consumption.

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

Balanced diet: Elements, Food groups. Recommended Daily Allowance. Nutritive value of foods. Calculation of balanced diet for different categories of people. Planning menu. Budgeting of food.

Introduction to therapeutic diets:

Naturopathy – Diet

Assessment of nutritional status- Objectives. Diet survey – objectives and methods.

PRACTICAL

Qualitative experiments

1. Qualitative analysis of carbohydrates (Glucose, fructose, lactose, maltose, sucrose).
2. Qualitative analysis of Proteins (Casein, Albumin, Gelatin)
3. Qualitative analysis of normal constituents of urine.
4. Qualitative analysis of abnormal constituents of urine.

Quantitative experiments

1. Quantitative estimation of carbohydrates by DNSA method.
2. Quantitative estimation of proteins by Biuret method.
3. Quantitative estimation of serum cholesterol.
4. Quantitative estimation of blood creatinine by Jaffe's method
5. Estimation of Urea in Serum.
6. Estimation of SGOT in serum.
7. Estimation of SGPT in serum.
8. Determination of Salivary amylase activity.
9. Quantitative estimation of urine sugar by Benedict's reagent method.
10. Quantitative estimation of urine calcium by precipitation method.
11. Demonstration of electrophoresis- agar gel- interpretation of simple patterns.
12. Demonstration of chromatography-paper/TLC.

References:

1. Text of Biochemistry for Medical students by Vasudevan & Sreekumari.
2. Harper's Biochemistry by Robert K. Murray, Daryl K. Granner and Victor W. Rodwell.
3. Biochemistry with Clinical Correlations by Thomas . M. Devlin.
4. Biochemistry by Stryer.
5. Biochemistry by D.Satyanarayan and U.Chakrapani.
6. Outlines of Biochemistry by Conn and Stumpf
7. Practical Biochemistry by R.C. Gupta and S. Bhargavan.
8. Introduction of Practical Biochemistry by David T. Plummer.
9. Practical Biochemistry by Harold Varley
10. Handbook of food& Nutrition, Dr. Swaminathan M. The Bangalore Printing & Publishing Co, Lts.
11. Food & Nutrition facts & figures, Gupta L C, et al. New Delhi, Jaypee.
12. Nutrition & Dietetics for Health care. Barrer M Helen.
13. Text book of Foods, Nutrition & Dietetics, Raheena Beegam.M. A .New Delhi, Sterling Publishers Pvt. Ltd.

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

- 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

- 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

- 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

- a. Motivation cycle (need, drive, incentive, reward).

- b. Classification of motives.
- c. Abraham Maslow's theory of need hierarchy

5. Frustration and conflict

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

6. Emotions

- 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

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

8. Thinking

- 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

- 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

- 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

- 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:

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:

1. Meaning of social factors

2. Role of social factors in health and illness

3. Socialization:

1. Meaning and nature of socialization

2. Primary, Secondary and Anticipatory socialization

3. Agencies of socialization

4. Social Groups:

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:

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:

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:

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

8. Social Change :

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

9. Social Problems of disabled :

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 :

Social security and social legislation in relation to the disabled.

11. Social worker:

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

FIRST AID & NURSING

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)

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)

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, Fowler'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

Subject Title	:	Orientation to Physiotherapy
Duration	:	0 - 12 Months
Total Hours	:	60
Theory	:	60 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
- b. Physiotherapist as 'Educator'
- c. Typical Job settings
- d. Common problems and solutions.

COMUICATNIVE ENGLISH

Subject Title	:	ENGLISH
Duration	:	0 - 12 Months
Total Hours	:	90
Theory	:	90 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:

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:

Applied Grammar:

Correct usage

The structure of sentences

The structure of paragraphs

Enlargements of Vocabulary

Unit - III:

Written Composition:

Precise writing and summarizing

Writing of bibliography

Enlargement of Vocabulary

Unit - IV

Reading and comprehension

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

Enlargement of Vocabulary..

Unit - V

The Study of Various Forms of Composition Paragraph, Essay, Letter, Summary, Practice in writing

Unit - VI

Verbal communication:

Discussions and summarization, Debates, Oral Verbal Communication: Discussions and , reports, use in teaching.

Syllabus BPT 1 Year

References

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.

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.

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

I

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

II

- 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

1. Operating systems

- a. MS DOS 6.22
- b. MS WINDOWS98/2000
- c. LINUX

2. Application Software

- a. MS OFFICE 2000 (MS WORD, EXCEL, MS POWERPOINT

IV

1. Application of computers in Health Education Training and Administration.

References

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

BPT IInd YEAR

BIOMECHANICS

Syllabus BPT II Year

Title	: Biomechanics
Duration	: 13-24 Months
Total Hours	: 150 Hrs
Theory	: 100 Hrs
Practical	: 50 Hrs
Total Hours/week	: 5

Course Description

Biomechanics involves the study of basic concepts of human movement, and application of various biomechanical principles in the evaluation and treatment of disorders of Musculoskeletal system. Students are taught to understand the various quantitative methods of movement. Mechanical principles of various treatment methods are studied. Study of posture and gait are also included.

THEORY

1. Basic Concepts in Biomechanics: Kinematics and Kinetics

- 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

- 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

- 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

- 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 in relation to pregnancy, scoliosis and COPD

5. The Temporomandibular Joint

a) General features, structure , function and dysfunction

6. *Biomechanics of the vertebral column*

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 of the peripheral joints*

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. Analysis of Posture and Gait:

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: 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, Rs 250.00*
- 3. Clinical Kinesiology for Physical Therapist Assistants, JP Bros Medical Publishers, Bangalore, 1st Indian Ed 1997, Rs 300.00*

ELECTROTHERAPY

Course Description

In this course the student will learn the Principles, Techniques, Effects, Indications, Contra-indication. And the dosage parameters for various indications of 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 list the indications, Contra-indications, dosage of electrotherapy modalities, demonstrates the different techniques, and describe their effects on the various 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.

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. Condensers: 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 – Therapeutics Electricity

Section II A – Low frequency Currents

1. Basic types of current.

- 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, hyperhydrosis, 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

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

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)

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 MWD Applications, 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: High pressure mercury vapour lamp, Water cooled mercury vapour lamp, Kromayer lamp, Fluorescent tube, Theraktin tunnel. Psoralen Photochemotherapy, pharmacology and mechanism of action, PUVA apparatus, PUVA regimen. Physiological & Therapeutic Effects. Sensitizers & Filters. Test dosage calculation. Calculation of EI, E2, E3, E4 doses. Indications, contraindications. Dangers. Dosages for different therapeutic effects. Distance in UVR lamp

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.

- 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

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 the technique of UVR exposure for various conditions - calculation of test dose
11. Demonstrate treatment method using IFT for various regions
12. Calculation of dosage and technique of application of LASER
13. Technique of treatment and application of Hydrocollator packs, cryotherapy, contrast bath. Wax therapy
14. Demonstrate the treatment method using Whirl pool bath
15. Winding up procedure after any electrotherapy treatment method.

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 Michèle Cameron*
6. *Principles of Electrotherapy by Michèle Cameron*
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 techniques in the restoration of physical function

Subject Title	:	EXERCISE THERAPY
Duration	:	13-24 Months
Total hours	:	240
Week	:	8
Theory	:	120 hrs
Practical	:	120 hrs

THEORY

1. **Mechanical Principles:** 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**

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**

- 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 ankle of pelvic inclination

4. Relaxation

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, additional methods.

5. Passive movements

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

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 eccentric 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 angle isometric. Isokinetic regimens

Pylometric Exercises

7. Proprioceptive Neuromuscular Facilitation

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

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

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

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

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

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

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 for treating impaired balance: mode, posture, movement, Precautions & contraindications, Types Balance retraining.

14. Co-ordination Exercise

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: uses of Frenkel's exercise, technique of Frenkel's exercise, progression, home exercise.

15. Posture

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

16. Walking Aids

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

Frames

17. Hydrotherapy

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

Advantages and Disadvantages, Organisation of Group exercises. Recreational Activities and Sports

19. Introduction to Yoga

Asanas - Principles and elements; Pranayamas - Principles. Methods and Techniques

PRACTICALS

The students of exercise therapy are to be trained in Practical Laboratory work for all the topics discussed in theory. The student must be able 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 the techniques for muscle strengthening based on MMT grading
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

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. *Therapeutic massage by Sinha*
10. *Principles of muscle testing by Hislop*

PHARMACOLOGY

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

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

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

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

Drugs used in the Treatment of Heart Failure: Digitalis, Diuretics, Vasodilators, ACE inhibitors, Antihypertensive drugs: Diuretics, Beta blockers, Calcium Channel Blockers. ACE inhibitors, Central Acting Alpha Agonists, Peripheral Alpha Antagonists, Direct Acting Vasodilators Antiarrhythmic Drugs

Drugs used in the Treatment of Vascular Disease and Tissue Ischemia: Vascular Disease, Hemostasis Lipid-Lowering agents, 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. Neuroparmacology

Sedative-Hypnotic Drugs: Barbiturates, Benzodiazepines

Antianxiety Drugs: Benzodiazepines, Other Anxiolytics

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

5. Disorders of Movement

Drugs used in Treatment of Parkinson's Disease

Antiepileptic Drugs

Spasticity and Skeletal Muscle Relaxants

6. Inflammatory/Immune Diseases

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

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

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

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

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

7. Digestion and Metabolism

Gastrointestinal Pharmacology: Peptic Ulcers Disease, Constipation, Diarrhoea

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

8. Geriatrics

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. Muruges*
5. *Pharmacology & Pharmacotherapeutics by Sadoskar.*

MICROBIOLOGY & PATHOLOGY

Subject Title	:MICROBIOLOGY
Duration	: 13-24 Months
Total Hours	: 60 Hrs
Theory	: 45Hrs
practical	: 15 Hrs
Total Hours/week	: 2 Hrs

THEORY

1.General Microbiology

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

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

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

Staphylococci.

Streptococci and Pneumococci,

Mycobacteria: Tuberculosis.

M.leprae. atypical mycobacteria, Enterobacteriaceae

Vibrios : V. cholerae and other medically important

vibrios, Campylobacters and Helicobacter,

Pseudomonas

Bacillus anthracis

Sporing and non-sporing anaerobes Clostridia,

Bacteroides and Fusobacteria,

4. General Virology

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

5. Mycology:

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

6. Clinical/Applied Microbiology

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:

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

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.

Subject Title	PATHOLOGY
Duration	13-24 Months
Total Hours	60
Theory	40 Hrs
Practical	15 Hrs
Total Hours/week	2 Hrs

THEORY**General Pathology**

1. Introduction to pathology

2. **Cell injuries** : Aetiology and pathogenesis with a brief recall of important aspects of normal cell structure. Reversible cell injury: Types, sequential changes, cellular swellings, vacuolation, hyaline changes, mucoid changes. Irreversible cell injury: Types of necrosis and gangrene. Autolysis. Pathological calcification: Dystrophic and metastatic, intra cellular accumulations – fatty changes, protein accumulations, glycogen accumulations. Pigments – melanin or hemosiderin. Extra cellular accumulations: Amyloidosis – classification, pathogenesis, pathology including special stains.
3. **Inflammation and repair**: 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**: 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**: Mycobacterial diseases: Tuberculosis, leprosy and syphilis. Bacterial disease: Pyogenic, diphtheria, gram negative infection, bacillary dysentery. Viral diseases: poliomyelitis, herpes, rabies, measles, rickettsia, chlamydial infection, HIV infection. Fungal disease and opportunistic infections. Parasitic diseases: Malaria, filaria, amoebiasis, kala-azar, cysticercosis, hydatid cyst.
6. **Circulatory disturbances**: 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**: Atrophy, hypertrophy, hyperplasia, aplasia, hypoplasia, metaplasia, malformation, agenesis, dysplasia. Precancerous lesions. Neoplasia: Definition, classification, biological behavior 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. Benign and malignant epithelial tumors eg. Squamous papilloma, Squamous cell carcinoma, malignant melanoma. Benign and malignant mesenchymal tumors eg. Fibroma, lipoma, neurofibroma, fibrosarcoma, liposarcoma, rhabdo-myosarcoma, teratoma.
8. **Urinary system**: Glomerular nephritis, Nephrotic Syndrome, Urinary tract infection, Renal calculi, Renal carcinomas

9. Nutritional disorders: Protein energy malnutrition: Marasmus, kwashiorkor, and vitamin deficiency disorders, classification with specific examples.

10. Genetic disorders: Basic concepts of genetic disorders and some common examples and congenital malformation. Systemic pathology

11. Hematology: constituents of blood & bone marrow.

Regulation of homeopoiesis

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: Thalassemia, Sickle cell anemia, Spherocytosis and Enzyme deficiencies.

Acquired hemolytic anaemias

i. Alloimmune, Autoimmune

ii. Drug induced, Microangiopathic

Pancytopenia - Aplastic anemia.

Hemostatic disorders, Vascular and Platelet disorders & lab diagnosis.

Coagulopathies - (i) Inherited (ii) Acquired with lab diagnosis.

Leukocytic disorders: Leukocytosis, Leukopenia, Leukemoid reaction.

Leukemia: Classification, clinical manifestation, pathology and Diagnosis.

Multiple myeloma and dysproteinemias.

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

11. Respiratory System

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

12. Cardiovascular Pathology

Congenital Heart disease: Atrial septal defect, Ventricular septal defect, Fallot's tetralogy.

Patent ductus arteriosus. Endocarditis. Rheumatic Heart disease. Vascular diseases: Atherosclerosis, Monckeberg's medial calcification, Aneurysm and Arteritis and tumours of Blood vessels. Ischemic heart Disease: Myocardial infarction. Hypertension and hypertensive heart Disease.

13. Alimentary tract

Oral Pathology: Ulcers, leukoplakia, Carcinoma, oral cavity diseases and tumour of salivary gland & esophagus and precancerous lesions, Esophagus inflammatory, functional disorders and tumours. Stomach: Gastritis, Ulcer & Tumours. Tumours and tumour like condition of the small and large Intestine: Polyps, carcinoid, carcinoma, Lymphoma. Pancreatitis and pancreatic tumours:

i) Exocrine,

ii) Endocrine

Salivary gland tumours : Mixed, Warthin's

14. Hepato-biliary pathology

Jaundice: Types, aetio-pathogenesis and diagnosis. Hepatitis: Acute, Chronic, neonatal. Alcoholic liver disease Cirrhosis: Postnecrotic, Alcoholic, Metabolic and Portal hypertension Liver abscesses; Pyogenic, parasitic and Amoebic. Tumours of Liver

15. Lymphatic System

Diseases of the gall bladder: Cholecystitis, Cholelithiasis, Carcinoma. Lymphadenitis - Nonspecific and granulomatous Causes of Lymph Node enlargements. Reactive Hyperplasia, Primary Tumours - Hodgkin's and Non hodgkin's Lymphomas, Metastatic Tumours. Causes of Splenic Enlargements.

16. Musculoskeletal System

Osteomyelitis, acute, chronic, tuberculous, mycetoma Metabolic diseases: Rickets/Osteomalacia, osteoporosis, Hyperparathyroidism, Paget's disease. Tumours Classification: Benign, Malignant, Metastatic and synovial sarcoma. Arthritis: Suppurative, Rheumatoid. Osteoarthritis, Gout, Tuberculous.

17. Endocrine pathology

Diabetes Mellitus: Types, Pathogenesis, Pathology, Laboratory diagnosis Non-neoplastic lesions of Thyroid: Iodine deficiency goiter, autoimmune Thyroiditis, Thyrotoxicosis, myxedema. Hashimoto's thyroiditis. Tumours of Thyroid: Adenoma, Carcinoma: Papillary, Follicular, Medullary, Anaplastic. Adrenal diseases: cortical hyperplasia, atrophy, tuberculosis, tumours of cortex and medulla.

18. Neuropathology : Inflammations and Infections: TB

Meningitis, Pyogenic Meningitis, viral meningitis, Syphilis and Brain Abscess. Tuberculosis, Cysticercosis

CNS Tumors, Astrocytoma, Neuroblastoma, Meningioma, Medulloblastoma

Vascular lesions of CNS

AHC diseases including Poliomyelitis

Peripheral neuropathies including Diabetic neuropathies, Hereditary neuropathies

Basalganglia – Parkinsonism

Dementia - Alzheimer's disease

Disorders of spinal cord – SCD, Trauma, Syringomyelia, Tabes dorsalis

19. Dermatopathology

Skin tumors: Squamous cell carcinoma, Basal cell carcinoma, Melanoma
Psoriasis
Scleroderma

Recommended Textbooks

1. *Text book of pathology: Harshmohan*
2. *General systemic pathology: Churchill Livingstone*
3. *Text book of pathology: Robbins*

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

RESEARCH METHODOLOGY

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.

BIOSTATISTICS

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? Basic principle of ANOVA, ANOVA technique, Analysis of Co variance(ANACOVA)

Recommended Textbooks:

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

THIRD 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 & General 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.[4 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 the following conditions : Reflux Oesophagitis, Achlasia Cardia, GI bleeding, Peptic Ulcer disease, Pancreatitis, Malabsorption Syndrome, Ulcerative Colitis, Peritonitis, Infections of Alimentary Tract ; Clinical manifestations of liver diseases - Aetiology, clinical features, diagnosis, complications and treatment of the following

conditions : Viral Hepatitis, Wilson's Disease, Alpha1-antitrypsin deficiency, Gall stones, Cholecystitis. [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. [6 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 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.[3 Hours]
3. 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. [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, Tetralogy 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 Pneumectomy, 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, Appendicectomy 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. Women's 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 – Hysterosalpingography, 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.

Subject Title	:	Physiotherapy in General Medicine and Surgery
Duration	:	25 – 36 Months
Total Hours	:	150 Hrs
Theory	:	90 Hours
Practical	:	60 Hours
Total Hours / Week	:	5 Hrs
Lecture	:	3 Hours / Week
Practicals	:	: 2 Hours / Week

Method of Assessment : Written, Oral, Practical

Bedside assessment of the patients [5Hours]

Management of wound ulcers- Care of ulcers and wounds - Care of surgical scars using electro therapeutics for healing of wounds, prevention of Hypergranulated Scars Keoloids, Electrotherapeutics measures for relief of pain during mobilization of scars tissues. [5 Hours]

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; (2 Hours)

Evaluation, planning and management of leprosy-prescription, fitting and training of devices and prevention of disability [5 Hours]

Burns management - Role of physiotherapy in the management of burns, post grafted cases- Mobilization and Musculo-skeletal restorative exercises following burns [5 Hours]

Physiotherapy management following PVD [3 Hours]

Abdominal Surgeries - Management of Pulmonary Restorative Dysfunction following Surgical procedures on Abdomen and Thorax [5Hours]

Management of Amputations following Diabetes, PVD - Prosthesis in amputations of lower limbs following ulcers and gangrenes [8Hours]

Physiotherapy intervention in the management of Medical, Surgical and Radiation Oncology Cases [8 Hours]

Physiotherapy for Plastic surgery and Organ transplantations [5 Hrs]

Home program and education of family members in patient care [5 Hours]

Physiotherapy in Obstetrics – Physiotherapy in pregnancy. Electrotherapy and Exercise Therapy measures for the Women's health issues [10 Hours]

Treatment, Response to exercise and Implications of Physiotherapy in the following disease conditions: Hypertension, Diabetes, Renal Failure and Obesity. [5 Hours]

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]

Role of P.T in management of age related diseases and disorders such as – Osteoporosis, Dementia, Fall prevention and fitness programmes. [5 Hours]

Outcome measurement in General surgical and medical Physiotherapy care[5Hrs]

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 therapist 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. Chauffer'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 plat, 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 Jones'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. Syphilitic infection of joints.. Bone Tumors: classification, clinical features, management - medical and surgical of the following tumors :

Osteoma. Osteosarcoma, Osteochondroma. Enchondroma. Ewing's sarcoma. Giant 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, patho-physiology, 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 disabilities due to musculoskeletal dysfunction, plan and set treatment goals and apply the skills gained in exercise therapy and electrotherapy in these clinical situations to restore musculoskeletal function.

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 length testing-tightness, contracture and flexibility, manual muscle testing, peripheral neurological examination dermatomes, myotomes and reflexes, special tests and functional tests. Prescription of home program. Documentation of case records, and follow up. [5 Hours]
2. Fractures - types, classification, signs and symptoms, complications. Fracture healing – factors affecting fracture healing. Principles of fracture management - reduction - open and closed, immobilization - sling, cast, brace, slab, traction - manual, mechanical, skin, skeletal, lumbar and Cervical traction, external fixation, functional cast bracing. PT management in complications - early and late - shock, compartment syndrome, VIC, fat embolism, delayed and mal union, RSD, myositis ossificans, AVN, pressure sores etc. 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. [9 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. [6 Hours]
4. Selection and application of physiotherapeutic techniques, maneuver's, modalities for preventive, curative and rehabilitative means in all conditions. [2 Hours]
5. Principles 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. Cerebral palsy: Definition, etiology, classification, clinical features, complications, deformities, medical and surgical management and home program with special emphasis on carrying techniques. PT management after surgical corrections. [2 Hours]

11. 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]

12. 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]

13. 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. [3 Hours]

14. 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. [5 Hours]

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

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

17. 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. [4 Hours]

18. 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]

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

20. 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]

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

22. 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]

23. Ankle and foot: Ankle instability. Ligamentous tears- Post operative management. [1 Hour]

24. Sports Physiotherapy : Physical fitness. 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. [5 Hours]

Practical: 60 Hours

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

1. Bedside case presentations and case discussions
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

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

REHABILITATION & BIO-ENGINEERING

Subject Title	:	Rehabilitation & Bio-engineering
Duration	:	25 – 36 Months
Theory	:	60 Hours
Practical	:	30 Hours
Total Hours	:	90 Hrs
Lecture	:	3 Hours / Week
Method of Assessment	:	Written

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
2. 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.

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

Fourth 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 therapist 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 treatment methods for various neurological conditions.

Subject Title	:	Clinical Neurology and Neuro Surgery
Duration	:	37-48 months
Total Hours	:	60
Theory	:	60 hours
Total Hours/ week	:	2 hours
Method of Assessment	:	Written, Oral

Theory:

1. Basic Neuro Anatomy and Neurophysiology including Development of nervous system. **(4 hours)**
2. Clinical symptomatology in Neurology **(4 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. **(4hours)**
4. Definitions, Etiology, Pathology, Clinical Presentations, Diagnostic approaches including radio diagnosis, Differential Diagnosis, Complication and Medico – Surgical Management of **Pediatric Neurological Disorders (10 Hours)**
 - 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 (8Hours)
- 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 Arachnoiditis
 - 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 (8 Hours)
- 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 (6 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 (6 Hours)

- 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 (6 Hours)

- 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 **(4 Hours)**
- a. Metabolic encephalopathies
 - b. B12 Deficiency
 - c. Alcohol related disorders
 - d. Nutritional Polyneuropathies
 - e. Neurolathyrim

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 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 patient.

Subject	:	Physiotherapy in Neuro Sciences
Duration	:	37-48 months
Total Hours	:	120
Theory	:	80 hours
Practical	:	40 hours
Total Hours per week	:	4 hours
Lecture	:	3 hours/week
Practical	:	1 hours/week
Method of Assessment	:	Written, Oral, Practical
Theory	:	80 Hours

1. Introduction to Motor Control & Motor Learning, Introduction to Neural Plasticity **(6 Hours)**
2. Introduction to various Neuro Developmental Approaches including Bobath, Rood's, PNF, Brunstrom, 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 **(24 Hours)**.
3. Physiotherapy Evaluation including Neuro developmental Screening, differential diagnosis of Pediatric Nervous system and Practical application of various motor control theories in **(16 Hours)**

- 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, differential diagnosis, Investigations (including Radiodiagnosis, electro physiology, lab studies, non invasive procedures) of Nervous system
Practical application of Physiotherapeutics in **(30 Hours)**

Inflammation of the Nervous System

- Meningitis
- Encephalitis
- Neuro Syphilis
- Poliomyelitis
- Peripheral Neuritis
- Tetanus
- Infective and Post Infective Neuropathies
- Infective Myelopathies
- Spinal Arachnoiditis
- Tabes Dorsalis
- Transverse Myelitis

Degenerative and Demyelination of CNS

- Basal ganglia: Parkinsonism, Huntington Disease, Associated Dyskinesia, Dystonia, Rett's Syndrome etc

- Cerebellar: Friedrich's and Cerebellar ataxia
- Cerebrum: Alzheimers Disease, Demetia, Multiple Sclerosis
- Spinal Cord: Non compressive Myelopathy
- Pereipheral Nerve: Diabetic, Metabolic Neuropathies, NMJ disorders, Motor Neuron Disease

Trauma of Nervous System

- Head Injury
- Spinal Cord Injury
- Pereipheral Nerve Injury

Compression of Nervous System

- 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

- CVA
- Vertebral Stroke
- Moya Moya Disease
- VBI

Toxic, Metabolic injuries and Nutritional disorders

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

5. Practical application of Physiotherapeutics in Neurogenic Bowel and Bladder disorders (**4 Hours**)

PRACTICALS: 40 hours

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

1. Bedside case presentations and case discussions.
2. Lab sessions consisting of evaluation and assessment methods on student models, treatment techniques and practice sessions.

Reference:

1. Patricia Downie: Cash's book of neurology.
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 – Brunnstrom's movement therapy
8. Berta Bobath – Adult hemiplegia
9. Robert Carr & Shapard – Motor relearning Programme
10. Robert Carr & Shapard- Neurological rehabilitation
11. Ecker- Elements of pediatric physiotherapy
12. Barbara- physiotherapy for cerebral palsy children.
13. Adal Cuning – Key Issues in neurological physiotherapy.

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, 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	: 60
Theory	: 60 Hours
Total Hours / Week	: 2 Hours
Method of Assessment	: Written, Oral

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. [9 Hours]
 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. [9 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. [10 Hours]
 4. Paediatrics: Respiratory conditions of childhood – causes, complications, clinical manifestations, diagnosis and treatment. [3 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. [4 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. [3 Hours]
4. Thoracic surgeries – Thoracotomy – Definition, Types of Incisions with emphasis to the site of incision, muscles cut and complications. Lung surgeries: Pneumectomy, 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]
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.[1 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). [3 Hours]
8. Cardio Pulmonary Resuscitation and Airway care. [2 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. Patrica A Downie, Text book of Heart, Chest Vascular Disease for physiotherapists, 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 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.

Subject Title	:	PHYSIOTHERAPY IN CARDIO-RESPIRATORY DISORDERS & INTENSIVE CARE MANAGEMENT
Duration	:	37 – 48 Months
Total Hours	:	120
Theory	:	80 Hours
Practical	:	40 Hours
Total Hours / Week	:	4
Lecturer	:	3 Hours / Week
Practical	:	1 Hours / Week
Method of Assessment	:	Written, Oral, Practical

Theory: 80 Hours

1. Anatomical and Physiological differences between the Adult and Paediatric lung [1 Hour]
2. Bedside assessment of the patient – Adult & Paediatric [5 Hours]
3. Investigations and tests – Exercise tolerance Testing – Cardiac & Pulmonary, Radiographs, PFT, ABG, ECG, Haematological and Biochemical Tests [6 Hours]
4. Physiotherapy techniques to increase lung volume – Controlled mobilization, Positioning, Breathing exercise, Neurophysiological Facilitation of Respiration, Mechanical Aids – Incentive Spirometry, CPAP, IPPB [5 Hours]
5. 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 [4 Hours]
6. 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 [5 Hours]

7. Neonatal and Paediatric Physiotherapy – Chest physiotherapy for children, The neonatal unit, Modifications chest physiotherapy for specific neonatal disorders, Emergencies in the neonatal unit [3 Hours]
8. Physiotherapy in Obstructive lung conditions [4 Hours]
9. Physiotherapy in Restrictive lung conditions [4 Hours]
10. Management of breathlessness [2 Hours]
11. Pulmonary Rehabilitation [4 Hours]
12. Physiotherapy following Lung surgeries [4 Hours]
13. Respiratory failure – Oxygen Therapy and Mechanical Ventilation [4 Hours]
14. 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 [5 Hours]
15. Physiotherapy management following cardiac surgeries [3 Hours]
16. Cardiac Rehabilitation [4 Hours]
17. Home program and education of family members in patient care [2 Hours]
18. Treatment, Response to exercise and Implication of Physiotherapy in the following disease conditions: Hypertension, Diabetes, Renal Failure and Obesity. [5 Hours]
19. 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. [5 Hours]
20. Cardio Pulmonary Resuscitation [2 Hours]
21. Applied Yoga in Cardio-respiratory conditions. [3 Hours]

Practical: 40 Hours

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

1. Bedside case presentations and case discussions
2. 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. Physiotherapy in Psychiatry

COMMUNITY BASED REHABILITATION**Subject Description**

The subject serves to integrate the knowledge gained by the students in community medicine and other areas with 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 rehabilitation methods to prevent disabilities and dysfunctions due to various disease conditions and plan and set treatment goals and apply the skills gained in rehabilitating and restoring functions.

Subject Title	:	COMMUNITY BASED REHABILITATION
Duration	:	37 – 48 Months
Total Hours	:	120
Theory	:	80 Hours
Practical	:	40 Hours
Total Hours / Week	:	4
Lecturer	:	3 Hours / Week
Practical	:	1 Hours / Week
Method of Assessment	:	Written, Oral, Practical

Theory: 80 Hours

1. Rehabilitation: Definition, Types [1 hour]

2. Community: Definition of Community, Multiplicity of Communities, The Community based approach, Community Entry strategies, CBR and Community development, Community initiated versus community oriented programme, Community participation and mobilization [5hours]

3. Introduction to Community Based Rehabilitation: Definition, Concept of CBR, Need for CBR, Difference between Institution based and Community based Rehabilitation, Objectives of CBR, Scope of CBR, Members of CBR team, Models of CBR [6hours]

4. Principles of Community based Rehabilitation. W.H.O.'s policies-about rural health care concept of primary /tertiary health centers-district hospitals etc-Role of P.T.-Principles of a team work of Medical person/P.T./O.T. audiologist/speech therapist /P.&O./vocational guide in C.B.R. of physically handicapped person, Agencies involved in rehabilitation of physical handicapped - Legislation for physically handicapped. Concept of multipurpose health worker. Role of family members in the rehabilitation of a physically handicapped. [8 hours]

5. Planning and management of CBR Programmes, CBR Programmed planning and management, Ownership and Governance, Decentralization and CBR, Management of CBR, Programmed sustainability, Communication and Coordination, Community participation, mobilization and awareness, CBR programme influence on promoting and developing public policies [5 hours]

6. Disability: Definition of Impairment, Handicap and Disability, Difference between impairment, handicap and disability, Causes of disability, Types of disability, Prevention of disability, Disability in developed countries, Disability in developing countries, Disability Surveys: Demography. Screening: Early detection of disabilities and developmental disorders, Prevention of disabilities- Types and levels [5 hours]

7. Disability Evaluation: Introduction, What, Why and How to evaluate, Quantitative versus Qualitative data, Uses of evaluation findings [4 hours]

8. Role of Government in CBR: Laws, Policies, Programmes, Human Rights Policy, Present rehabilitation services, Legal aspects of rehabilitation [6 hours]

9. Role of Social work in CBR: Definition of social work, Methods of social work, History of social work, Role of social worker in rehabilitation [4 hours]

10. Role of voluntary Organizations in CBR: Charitable Organizations, Voluntary health agencies – National level and International NGO's, Multilateral and Bilateral agencies. International Health Organizations: WHO, UNICEF, UNDP, UNFPA, FAO, ILO, World bank, Rockfeller, Ford foundation, CARE, RED CROSS. [4 hours]

11. National District Level Rehabilitation Programme: Primary rehabilitation unit, Regional training center, District rehabilitation center, Primary Health center, Village rehabilitation worker, Anganwadi worker [4 hours]

12. 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. [4 hours]

13. Screening and rehabilitation of pediatric disorders in the community: Early detection of high risk babies, Maternal nutrition and education, Rehabilitation of Cerebral Palsy, Polio, Downs Syndrome, Muscular Dystrophies etc., Prevention and rehabilitation of mental retardation and Behavioural disorders, Immunization programmes, Early intervention in high risk babies, Genetic counseling [6hours]

14. Extension services and mobile units: Introduction, Need, Camp approach [2 hours]

15. Vocational training in rehabilitation: Introduction, Need, Vocational evaluation, Vocational rehabilitation services [2 hours]

16. Geriatrics - Physiology of Aging /degenerative changes-Musculoskeletal /Neuromotor /cardio – respiratory-/Metabolic, Endocrine, Cognitive, Immune systems. Role of PhysioTherapy in Hospital based care, Half-way homes, Residential homes, Meals on wheels etc. Home for the aged, Institution

based Geriatric Rehabilitation. Few conditions:- Alzheimer's disease, Dementia, Parkinson's Disease, Incontinence, Iatrogenic drug reactions, etc. Ethics of Geriatric Rehabilitation. [9 hours]

17. Introduction to Industrial Health & Ergonomics [4hours] –

Practical: 40 Hours

This will consist of Field visits to urban and rural PHC's., Visits to regional rehabilitation training center, Regular mobile camps, Disability surveys in villages, Disability screening, Demonstration of Evaluation and Physiotherapy prescription techniques for musculoskeletal, neuromuscular, cardio-respiratory, paediatric, gynecological and geriatric problems in community, Demonstration of evaluation and prescription techniques for ambulatory and assistive devices, Fabrication of low cost assistive devices with locally available materials.

Recommended books:

1. Rehabilitation Medicine by Howard A Rusk.
2. Rehabilitation Medicine by Joel A De lisa
3. Pruthvish, Community Based rehabilitation
4. Davis Warner, Disabled village children
5. Sauder, Text book of Rehabilitation

ETHICS, ADMINISTRATION & SUPERVISION

Subject Title	:	ETHICS, ADMINISTRATION AND SUPERVISION
Duration	:	37 – 48 Months
Total Hours	:	30
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 [2 hours]

- 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 - Memorandum Of Association & Rules And Regulations [3 hours]

ADMINISTRATION AND SUPERVISION

1. Introduction: Branches of administration, Nature and scope of administration, How to be an effective administrator, Planning hospital administration as part of a balanced health care program. [2 hours]

2. Principles of hospital administration and its applications to physiotherapy. [2 hours]

3. Planning and organization: Planning cycle, Principles of organizational charts, Resource and quality management, Planning change -innovation [2 hours]

4. Financial issues including budget and income generation [2 hours]

5. Hospital administration: Organization, Staffing, Information, Communication, Coordination, Cost of services, Monitoring and evaluation. [2 hours]
6. National health policy and health care system in India [2 hours]
7. Organization of physiotherapy department: Planning, Space, Manpower, Other basic resources. [2 hours]
8. Organizing meetings, committees, and negotiations [1 hour]
9. Personnel management: Personnel performance appraisal system, Quality care delivery from the staff [2 hours]
10. Material management [1 hour]
 - Pharmacy
 - Hospital waste disposal
11. Quality assurance [1 hours]
 - Hospital acquired infection
 - Quality assurance through record review and medical audit.
12. Public relations in hospital and human resource management. [1 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

PROJECT

Subject Title	:	PROJECT
Duration	:	37 – 48 Months
Total Hours	:	30
Method of Assessment	:	Oral, Practical

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.

MODEL QUESTION PAPER

BPT I YEAR DEGREE EXAMINATION PAPER I ANATOMY

Time: 3 Hours

Max. Marks: 100

(Draw diagrams where necessary)

I. Essays

1. Classify joints. Explain hip joint in detail. **(1 x 10 m = 10 Marks)**
2. Describe anatomy of urinary system **(1 x 10 m = 10 Marks)**

II. Short notes

1. Radius.
2. Spinal cord.
3. Glutes maximus.
4. Stomach.
5. Pericardium
6. Pituitary gland.
7. Intercostal muscles.
8. Tibial nerve.
9. Smooth muscle.
10. Interosseous membrane.

(10 x 5 m = 50 marks)

III. Short answers

1. Pronation.
2. Cubital fossa.
3. Lumbar vertebrae.
4. Transitional epithelium.
5. Circle of Willis.
6. Palmar aponeurosis.
7. Palatine tonsil.
8. Fallopian tube.
9. Sternal angle.
10. Adductor canal

(10x3 m = 30 marks)

MODEL QUESTION PAPER

BPT I YEAR DEGREE EXAMINATION PAPER II PHYSIOLOGY

Time: 3 Hours

Max. Marks: 100

(Draw diagrams where necessary)

I. Essays

1. Explain cardio respiratory changes during exercises **(5m+5m = 10 marks)**
2. Describe the Lateral Spinothalamic tract of spinal cord with a diagram. Enumerate the sensations carried by these tracts. **(8m+2m = 10marks)**

II. Short notes

1. Micturition reflex
2. Contraception
3. Insulin and its function
4. Hypoxia
5. Cerebro Spinal Fluid
6. Lactation
7. Functions of WBC
8. Reflex arc
9. Mechanism of Muscle contraction
10. Neuromuscular transmission **(10 x 5m = 50 marks)**

II. Short answers

1. Functions of Placenta.
2. Functions of Hypothalamus
3. Functions of Anti Diuretic Hormone
4. Functions of Plasma Protein
5. Juxtaglomerular apparatus.
6. Ovulation.
7. Electro Cardio Gram
8. Stretch reflex
9. Define Erythrocyte Sedimentation Rate
10. Conduction Deafness **(10x3m = 30 marks)**

MODEL QUESTION PAPER
BPT I YEAR DEGREE EXAMINATION

PAPER III BIOCHEMISRTY AND NUTRITION

Time: 3 Hours

Max. Marks: 100

(Draw diagrams where necessary)

I. Essays

1. Describe the classification of carbohydrates with examples. **(1 x 10 m = 10 Marks)**
2. Explain the electron transport system & mechanism of oxidative phosphorylation. **(1 x 10 m = 10 Marks)**

II. Short notes

1. Endoplasmic reticulum
2. Active site of an enzyme
3. Role of Insulin in metabolism.
4. Digestion and Absorption of protein
5. Explain Gluconeogenesis.
6. Explain β oxidation
7. Describe the biochemical function of vitamin A
8. Structure and organization of DNA
9. Describe Electrophoresis
10. Balanced diet **(10 x 5 m = 50 marks)**

III. Short answers

1. Renal function test
2. Explain pH acid, Base and Buffer
3. Biochemical role of calcium
4. Liver function test
5. Difference between Essential & Non essential fatty acid.
6. Difference between glucogenic & ketogenic amino acid.
7. Atherosclerosis
8. Define the terms BMI & BMR
9. Marasmus
10. Recommended daily allowance of diet. **(10x3m = 30 marks)**

MODEL QUESTION PAPER
BPT I YEAR DEGREE EXAMINATION

PAPER IV PSYCHOLOGY AND SOCIOLOGY

Time: 3 Hours

Max. Marks: 100

Section A Psychology

I. Essays

1. Theories of learning (1 x 10m = 10 mark)

II. Short notes

1. Study methods in psychology
2. Factors of attention
3. Maslov's need hierarchy theory
4. Psycho dynamic theory of personality (Freud)
5. Causes of individual difference (5 x 5m = 25 marks)

II. Short answers

1. I Q
2. Extrinsic motivation
3. components of emotion
4. Persuasion
5. Mnemonics

(5 x 3m = 15 marks)

Section B sociology

III. Essays

1. Explain the different methods of sociological investigations. (1 x 10m = 10 mark)

II. Short notes

1. Explain the importance of family on individual's health
2. Explain the importance of study of sociology for health care professionals
3. Explain the role of medical social worker
4. What are the features and health hazards of rural community
5. How is sociology related to anthropology, psychology and social psychology (5 x 5m = 25 marks)

III. Short answers

1. Socialization
2. Culture
3. Stress
4. Social change
5. Define Sociology

(5 x 3m = 15 marks)

QP Code:

Reg. No.:.....

SECOND YEAR BPT DEGREE EXAMINATIONS
(Model Question Paper)
Biomechanics

Time: 3 hrs

Maximum marks: 100

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essays

(2x10=20)

1. Explain in detail about shoulder complex and the mechanism of elevation of arm to abduction.
2. Describe the effects of disease injury and immobilization on joint structure and soft tissues

Short answers

(10x5=50)

3. Axis and planes of movement.
4. Flexion and extension of Hip
5. Gait Cycle
6. Classification of levers with suitable examples
7. Lumbo pelvic rhythm
8. Safe Lifting
9. Open and closed chain exercise.
10. Types of muscle action
11. Movements at Spine.
12. Explain very briefly about optimal posture

Short notes

(10x3=30)

13. Lumbosacral angle
14. Hip hiking
15. Locking and unlocking of knee joint
16. Equilibrium
17. Typical and a typical vertebrae
18. Cylindrical grip
19. Length tension relationship
20. Stress and strain curve
21. Force systems
22. Anatomical pulleys

QP Code:

Reg. No.:.....

SECOND YEAR BPT DEGREE EXAMINATIONS

(Model Question Paper)

Electro Therapy

Time: 3 hrs

Maximum marks: 100

- Answer all questions
- Draw diagrams wherever necessary

Essays

(2x10=20)

1. Define short wave diathermy, various methods of application, electrode spacing, various positions for placing electrode.
2. Describe electrical stimulation. Explain therapeutic and physiological effect of electrical stimulation and its indications and contraindications.

Short answers

(10x5=50)

3. Define resistance, factors affecting resistance;
4. Explain therapeutic ultra sound.
5. Therapeutic LASER
6. Describe SD curve
7. Define IFT, physiological effect, indication and contra indication
8. Describe methods and benefits of wax bath.
9. Cryotherapy and its techniques of application.
10. Explain briefly shock, causes of shock and its precautions
11. Pain gate theory
12. Fluidotherapy

Short notes

(10x3=30)

13. Transmission of heat
14. Capacitors
15. Iontophoresis
16. Accommodation
17. Types of IRR
18. Coupling media
19. Contrast Bath
20. Faradism Under Pressure
21. Whirlpool bath
22. Biofeedback

QP Code:

Reg. No.:.....

SECOND YEAR BPT DEGREE EXAMINATIONS
(Model Question Paper)
Exercise Therapy

Time: 3 hrs

Maximum marks: 100

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essays

(2x10=20)

1. Define co-ordination. Exercise to improve co-ordination Explain the techniques of Frenkel's
2. Explain resisted exercise with principles, indications, contra indication and precaution

Short answers

(10x5=50)

3. Isokinetic exercise
4. Crutch walking
5. Rhythmic stabilization
6. Group exercise
7. Types of muscle contraction
8. Muscle testing
9. Posture
10. Relaxation
11. Hydrotherapy
12. Yoga

Short notes

(10x3=30)

13. Gravity
14. Levers
15. Equilibrium
16. Pulleys
17. Goniometer
18. Balance
19. Bell's palsy
20. Percussion
21. Breathing exercise
22. Active movement

QP Code:

Reg. No.:.....

SECOND YEAR BPT DEGREE EXAMINATIONS
(Model Question Paper)
Pharmacology

Time: 1½ hrs

Maximum marks: 50

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essay

(10)

1. Classify antihypertensive drugs with suitable example. Mention its pharmacological actions and uses.

Short answers

(5x5=25)

2. Glucocorticoids
3. Drugs used for the treatment for mood disorders.
4. Tricyclic antidepressants
5. Peripheral muscle relaxants
6. Mention different routes of administration of drugs

Short notes

(5x3=15)

7. Oral hypoglycemic drugs.
8. Drugs used for the treatment of IHD
9. Aspirin.
10. NSAID's
11. Dopamine
12. Digitalis

Reg. No.:.....

SECOND YEAR BPT DEGREE EXAMINATIONS
(Model Question Paper)
Microbiology & Pathology

Time: 3 hrs

Maximum marks: 100

- Answer all questions
- Draw diagrams wherever necessary
- Write **Section A** and **Section B** in separate answer books. Do not mix up questions from **Section A** and **Section B**

QP Code:

Section A: Microbiology

Marks:50

Essay

(10)

1. Define urinary tract Infection? Enumerate the causative organisms and laboratory diagnosis of UTI.

Short answers

(5x5=25)

2. Laboratory diagnosis of myco bacterium tuberculosis
3. Autoclave
4. Virus
5. Staphylococcus
6. Disinfectants

Short notes

(5x3=15)

7. Dermatophytes
8. V D R L test
9. Cell mediated immunity
10. Gram's staining
11. Classification of bacteria

QP Code:

Section B:Pathology

Marks:50

Essay

(10)

1. Classify diseases of musculoskeletal system. Describe Osteoarthritis.

Short answers

(5x5=25)

2. Hypersensitivity reactions.
3. Shock
4. Cholelithiasis
5. Diabetes Mellitus
6. Vascular lesions of CNS

Short notes

(5x3=15)

7. Wound healing.
8. Nephrotic syndrome
9. Occupational lung diseases
10. Gangrene
11. Malaria

QP Code:

Reg. No.....

THIRD YEAR BPT DEGREE EXAMINATIONS
(Model Question Paper -2010 Batch)

General Medicine and General Surgery

Time: 3 hrs

Maximum marks: 100

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essay

(2x14=28)

1. What is Diabetes Mellitus, etiology, clinical features pathogenesis and management. (2+2+4+3+3=14)
2. Define peptic ulcer. Enlist classification. Describe the clinical manifestation of peptic ulcer. Explain the surgical management of peptic ulcer. (2+3+4+5=14)

Short essays

(4x8=32)

3. Define Bronchial Asthma, Classifications), Clinical Features and Detailed Medical Management
4. Explain about the Stages of Wound Healing and Types of Skin Graft.
5. Explain anemia, types, signs and symptoms
6. Explain COPD, clinical features and management.

Short answers

(10x4=40)

7. Haemophilia.
8. Lung Abscess.
9. Types of Obesity
10. Pneumothorax.
11. Alopecia.
12. Classification of epilepsy
13. Spina bifida
14. Arterio sclerosis
15. Prenatal complications
16. Hysterectomy

QP Code:

Reg. No.....

THIRD YEAR BPT DEGREE EXAMINATIONS
(Model Question Paper -2010 Batch)

Physiotherapy in General Medicine and General Surgery

Time: 3 hrs

Maximum marks: 100

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essays

(2x14=28)

1. Write in detail about the Assessment and Management of a 45 year old male patient, who has suffered with Chemical burn involving the face and chest.
2. Define Atherosclerosis. Write down the Pathogenesis, Clinical Features, Investigations and Detailed PT. Management for PVD.

Short essays

(4x8=32)

3. Explain about Abdominal Surgeries and Post Operative Management.
4. Explain role of Physiotherapy in OBG condition.
5. What is Radical Mastectomy. What is its PT. Management. Write Five Exercises for Radical Mastectomy.
6. List out the Common Geriatric Problems .What is the role of Physiotherapy in Geriatric Conditions.

Short answers

(10x4=40)

7. Osteoporosis.
8. Diastasis Recti.
9. Psoriasis.
10. Heart Transplantation.
11. Diabetic Neuropathy.
12. Exercise Prescription for Elderly and Women.
13. Buerger 's Exercise.
14. Hypertension and its Management.
15. Factors affecting exercise performance.
16. How will you Prevent Complications of DVT. .

QP Code:

Reg. No.....

THIRD YEAR BPT DEGREE EXAMINATIONS
(Model Question Paper -2010 Batch)

Clinical Orthopaedics and Sports Medicine

Time: 3 hrs

Maximum marks: 100

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essay

(2x14=28)

1. Explain Fractures, Types, Signs and Symptoms, Fracture healing and complications of Fractures.
2. Explain the Stages of IVDP. Enumerate the Clinical Features with emphasizing SLRT.

Short essays

(4x8=32)

3. Supracondylar fracture of the Humerus with Management.
4. What is Tennis Elbow.
5. Discuss Thoracic Outlet Syndrome.
6. Explain the Levels of Amputation of both Lower and Upper Limb with diagram.

Short answers

(10x4=40)

7. Carpel Tunnel Syndrome.
8. Biceps Tendon Rupture.
9. Chondromalacia Patella
10. Leprosy.
11. TB spine
12. Osteomyelitis.
13. CDH
14. Poliomyelitis
15. Plantar Fasciitis
16. De Quervain 's Disease

QP Code:

Reg. No.....

THIRD YEAR BPT DEGREE EXAMINATIONS
(Model Question Paper -2010 Batch)

Physiotherapy in Orthopaedics & Sports

Time: 3 hrs

Maximum marks: 100

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essays

(2x14=28)

1. Explain Adhesive Capsulitis with its Clinical features, Pathology and PT. Management.
2. Explain Colle 's Fracture. Discuss Complications. Give special emphasis on its PT. Management.

Short essays

(4x8=32)

3. RA Hand and PT. Management.
4. Osteoarthritis of Knee with PT. Management.
5. Perthe 's disease with PT. Management.
6. CTEV with PT. Management.

Short answers

(10x4=40)

EXPLAIN THE PT. MANAGEMENT OF THE FOLLOWING:

7. Torticollis
8. Ankylosing Spondylosis
9. Cervical Spondylosis
10. Golfer's Elbow
11. Mallet Finger.
12. Rotator Cuff Tendinitis
13. Below Knee Amputation.
14. Scoliosis.
15. Poliomyelitis
16. Lumbago

QP Code:

Reg. No.....

THIRD YEAR BPT DEGREE EXAMINATIONS
(Model Question Paper -2010 Batch)

Rehabilitation Science

Time: 3 hrs

Maximum marks: 100

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essays

(2x14=28)

1. Write an essay about Socio-Legal aspects of Rehabilitation in India.
2. Write an essay about Architectural Barriers and their modifications for a Wheelchair dependant patient in Home environment.

Short essays

(4x8=32)

3. Occupational Therapy
4. Mobility Aids.
5. Vocational Rehabilitation.
6. Disability Prevention.

Short answers

(10x4=40)

7. Spinal orthosis.
8. Audiogram.
9. International Health Organizations.
10. Foot Orthosis.
11. Anganwadi Workers
12. Cervical orthosis
13. Hearing Aids
14. Milwaukee Brace
15. Primary Health Centers.
16. Upper Limb Prosthetics.

QP Code:

Reg. No.:.....

FOURTH YEAR BPT DEGREE EXAMINATIONS

(Model Question Paper -2010 Batch)

Clinical Neurology and Neurosurgery

Time: 3 hrs

Maximum marks: 100

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essays

(2x14=28)

1. Discuss in detail the etiology, clinical features, investigation and management of duchenne muscular dystrophy.
2. Define and classify cerebral palsy. Discuss briefly clinical features, diagnosis and management of spastic cerebral palsy.

Short Essays

(4x8=32)

3. Describe clinical features, investigations and management of myasthenia gravis.
4. Classify brain tumors and outline management and treatment options for gliomas.
5. Classify peripheral nerve injuries and discuss the management of radial nerve injury.
6. Explain the pathophysiology and causes of epilepsy. Add a note on typical tonic clonic seizure.

Short Answers

(10X4=40)

7. Causes and management of cerebellar ataxia.
8. Discuss management of neurogenic bladder.
9. Bell's palsy.
10. Hydrocephalus and one surgical management.
11. WICU management for acute G. B. syndrome.
12. Discuss briefly motor examination.
13. Aphasias.
14. Autism spectrum disorders.
15. Tabes dorsalis.
16. Meningitis.

QP Code:

Reg. No.:.....

FOURTH YEAR BPT DEGREE EXAMINATIONS

(Model Question Paper -2010 Batch)

Physiotherapy in Clinical Neurology and Neurosurgery

Time: 3 hrs

Maximum marks: 100

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essays

(2x14=28)

1. Define cerebrovascular accident. Explain in detail about physiotherapy assessment and management for a 70 years old male patient who had an episode of acute MCA stroke.
2. Explain in detail about clinical assessment and physiotherapy management of 55 years old patient who is diagnosed with parkinsonism since two years.

Short Essays

(4x8=32)

3. Types, assessment and physiotherapy management of neurogenic bladder.
4. Biofeedback in neurological rehabilitation.
5. Assessment and management of cerebellar ataxia.
6. Assessment and management of peripheral neuropathies.

Short Answers

(10X4=40)

7. American spinal cord injury association (ASIA) scale
8. Define motor control and neuroplasticity.
9. Physiotherapy management for foot drop.
10. Define entrapment neuropathies. Mention the physiotherapy management of any one of entrapment neuropathies.
11. Sensory neuropathies and its management.
12. Physical therapy management of spasticity in cerebral palsy.
13. Vertebrobasilar insufficiency.
14. Physiotherapy management of Bell's palsy.
15. Differences between LMN and UMN lesions.
16. Neuro developmental therapy (NDT).

QP Code:

Reg. No.:.....

FOURTH YEAR BPT DEGREE EXAMINATIONS

(Model Question Paper -2010 Batch)

Clinical Cardio-Respiratory Disorders and Surgery

Time: 3 hrs

Maximum marks: 100

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essays

(2x14=28)

1. Explain in detail about the definition, aetiopathology, clinical features, diagnosis and management of chronic bronchitis.
2. Define thoracotomy. Explain in detail about the various thoracotomy incisions, indications and the muscles cut in each incision.

Short Notes

(4x8=32)

3. Types of anesthesia and their complications.
4. Interpretation of chest radiographs.
5. Definition, aetiopathology, clinical features, complications and management of ischemic heart diseases.
6. Definition, causes, types, complications, and management of atrial septal defect.

Short Answers

(10x4=40)

7. Define mitral valve stenosis and insufficiency.
8. Uses of electrocardiogram.
9. Heart sounds.
10. Define tetralogy of Fallot.
11. Pericarditis.
12. Types of asthma.
13. Define pneumonia. Mention the types of pneumonia.
14. Tension pneumothorax.
15. Types of emphysema.
16. Bronchodilators.

QP Code:

Reg. No.:.....

FOURTH YEAR BPT DEGREE EXAMINATIONS

(Model Question Paper -2010 Batch)

Physiotherapy in Cardio-Respiratory Disorders and Intensive Care Management

Time: 3 hrs

Maximum marks: 100

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essays

(2x14=28)

1. Explain in detail about the pathophysiology, clinical spectrum and physiotherapy management of COPD.
2. A 28 years old head injury patient is under mechanical ventilation in the ICU. Describe a suitable plan of physiotherapy management for him.

Short Essays

(4x8=32)

3. Technique of bronchial suctioning.
4. Physiotherapy management of 60 years old lady with pneumothorax undergoing intercostal drainage.
5. Indications and classical positions of postural drainage.
6. Cardiac rehabilitation program structure.

Short Answers

(10X4=40)

7. Exercise induced bronchospasm
8. CPAP
9. Factors affecting exercise performance.
10. Types of respiratory failure.
11. Flutter valve.
12. ECG changes in myocardial infarction.
13. Oxygen toxicity.
14. Contraindications for incentive spirometry.
15. Shaking and vibrations.
16. Huffing.

QP Code:

Reg. No.:.....

FOURTH YEAR BPT DEGREE EXAMINATIONS

(Model Question Paper -2010 Batch)

Community Based Rehabilitation

Time: 3 hrs

Maximum marks: 100

- *Answer all questions*
- *Draw diagrams wherever necessary*

Essays

(2x14=28)

1. Explain the role of voluntary organizations, voluntary health agencies and international health organizations in C.B.R.
2. Explain the concept of impairment, disability and handicap. Explain in detail about disability evaluation methods and purpose.

Short Essays

(4x8=32)

3. Concept of barrier free environment.
4. Define rehabilitation and explain the role of each members of a rehabilitation team.
5. Define vocational rehabilitation and explain its need in rehabilitation. Add a note on vocational assessment and evaluation methods
6. Explain, national district level rehabilitation programme. Add a note on primary rehabilitation unit, regional training center and district rehabilitation center.

Short Answers

(10X4=40)

7. Bilateral agencies.
8. Role of members of C.B.R team.
9. W.H.O
10. N.G.O's
11. Need for C.B.R
12. Red cross society
13. Mobility aids and assistive devices.
14. Crutch walking
15. Preventive measures of falls in elderly.
16. Prevention of pressure sores.
