



Jagannath University

Bahadurgarh - NCR

BACHELOR OF PHYSIOTHERAPY (B.P.T.)

Detailed Scheme and Syllabus
(w.e.f.- 2020)

L= LECTURE
T= TUTORIAL
P= PRACTICAL
FW/SW = Field Work/ Self Work

BACHELOR OF PHYSIOTHERAPY

COURSE INSTRUCTION

| COURSES/SUBJECT | | SUBJECT CODE | TEACHING HOURS | L-T-P-FW/SW | TOTAL CREDITS | YEARLY CREDITS * |
|--------------------------------|---------------------------------------|--------------|----------------|-------------|---------------|------------------|
| BPT 1st Year | | | | | | |
| | ANATOMY | B101 | 360 | 5-0-4 | 7 | 14 |
| | PHYSIOLOGY | B102 | 280 | 5-0-2 | 6 | 12 |
| | BIO-CHEMISTRY | B103 | 120 | 3-0-0 | 3 | 6 |
| | SOCIOLOGY | B104 | 80 | 2-0-0 | 2 | 4 |
| | GENERAL & CLINICAL PSYCHOLOGY | B105 | 160 | 4-0-0 | 4 | 8 |
| | BASIC PRINCIPLES IN PHYSIOTHERAPY | B106 | 120 | 3-0-0 | 3 | 6 |
| | ENGLISH COMMUNICATION | B107 | 40 | 1-0-0 | 1 | 2 |
| | Total transcript hours | | 1160 | | 26 | 52 |
| BPT 2nd Year | | | | | | |
| | PATHOLOGY & MICRO-BIOLOGY | B201 | 160 | 4-0-0 | 4 | 8 |
| | PHARMACOLOGY | B202 | 120 | 3-0-0 | 3 | 6 |
| | BIO-MECHANICS | B203 | 240 | 4-0-2 | 5 | 10 |
| | EXERCISE THERAPY | B204 | 280 | 3-0-4 | 5 | 10 |
| | ELECTROTHERAPY | B205 | 280 | 3-0-4 | 5 | 10 |
| | ETHICS AND LAW IN PHYSIOTHERAPY | B206 | 80 | 2-0-0 | 2 | 4 |
| | YOGA | B207 | 40 | 1-0-0 | 1 | 2 |
| | Total transcript hours | | 1200 | | 25 | 50 |
| BPT 3rd Year | | | | | | |
| | GEN. MEDICINE & PAEDIATRICS | B301 | 240 | 4-0-2 | 5 | 10 |
| | GEN. SURGERY AND OBS. & GYNAECOLOGY | B302 | 240 | 4-0-2 | 5 | 10 |
| | CLINICAL ORTHOPEDICS | B303 | 240 | 4-0-2 | 5 | 10 |
| | CLINICAL NEUROLOGY | B304 | 200 | 3-0-2 | 4 | 8 |
| | RESEARCH METHODOLOGY & BIO-STATISTICS | B305 | 120 | 3-0-0 | 3 | 6 |
| | COMMUNITY MEDICINE | B306 | 40 | 1-0-0 | 1 | 2 |
| | SUPERVISED CLINICAL TRAINING | B307 | 120 | 0-0-3 | 2 | 4 |
| | Total transcript hours | | 1200 | | 25 | 50 |

| BPT 4th Year | | | | | | |
|--------------------------------|---|------|-------------|---------|-----------|-----------|
| | PHYSIOTHERAPY IN ORTHOPAEDIC CONDITIONS | B401 | 240 | 4-0-2 | 5 | 10 |
| | PHYSIOTHERAPY IN NEUROLOGICAL CONDITIONS | B402 | 240 | 4-0-2 | 5 | 10 |
| | PHYSIOTHERAPY IN MEDICAL & SURGICAL CONDITIONS | B403 | 200 | 3-0-2 | 4 | 8 |
| | PHYSIOTHERAPY IN CARDIOTHORACIC CONDITIONS | B404 | 200 | 3-0-2 | 4 | 8 |
| | RATIONALE OF REHABILITATION | B405 | 120 | 3-0-0 | 3 | 6 |
| | PROJECT | B406 | | 0-0-0-4 | 2 | 4 |
| | SUPERVISED ROTATORY CLINICAL TRAINING | B407 | 200 | 0-0-5 | 3 | 6 |
| | Total transcript hours | | 1200 | | 26 | 52 |
| | Internship | | | | | |
| | Total Theory Hours | | | | | |
| | Total Practical Hours | | | | | |
| | Total Curricular Hours | | | | | |

DURATION OF COURSE:

BPT course will be a full time course.

Duration will be four years followed by compulsory six months rotator internship.

This course shall be divided into four professional examinations namely BPT Part-1 at the end of first academic year, BPT Part-II at the end of second academic year, BPT Part-III at the end of third academic year, BPT Part-IV at the end of fourth academic year

EXAMINATION:

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

DURATION OF EXAMINATION:

Each theory paper shall be of 3 hrs. duration.

SCHEME OF EXAMINATION

BPT 1st Year

| S.NO. | SUBJECT / PAPER | THEORY EXAMINATION | | PRACTICAL EXAMINATION | | DURATION OF UNIV. EXAM | Total Marks |
|--------------|-----------------------------------|---------------------------|--------------|------------------------------|--------------|-------------------------------|--------------------|
| | | INTERNAL | UNIV. | INTERNAL | UNIV. | | |
| 1. | ANATOMY | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| 2. | PHYSIOLOGY | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| 3. | BIO-CHEMISTRY | 30 | 70 | --- | --- | 3 Hrs. | 100 |
| 4. | SOCIOLOGY | 30 | 70 | --- | -- | 3 Hrs. | 100 |
| 5. | GENERAL & CLINICAL PSYCHOLOGY | 30 | 70 | --- | --- | 3 Hrs. | 100 |
| 6. | BASIC PRINCIPLES IN PHYSIOTHERAPY | 30 | 70 | --- | --- | 3 Hrs. | 100 |
| 7. | ENGLISH | 30 | 70 | - | - | 3 Hrs | 100 |
| TOTAL | | | | | | | 900 |

BPT 2nd Year

| S.NO. | SUBJECT /PAPER | THEORY EXAMINATION | | PRACTICAL EXAMINATION | | DURATION OF UNIV. EXAM | Total Marks |
|--------------|---------------------------------|--------------------|-------|-----------------------|-------|------------------------|-------------|
| | | INTERNAL | UNIV. | INTERNAL | UNIV. | | |
| 1 | PATHOLOGY & MICRO-BIOLOGY | 30 | 70 | -- | -- | 3 Hrs. | 100 |
| 2. | PHARMACOLOGY | 30 | 70 | -- | -- | 3 Hrs. | 100 |
| 3 | BIO-MECHANICS | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| 4. | EXERCISE THERAPY | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| 5. | ELECTRO THERAPY | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| 6. | ETHICS AND LAW IN PHYSIOTHERAPY | 30 | 70 | -- | -- | 3 Hrs. | 100 |
| 7. | YOGA | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| TOTAL | | | | | | | 1100 |

BPT 3rd Year

| S.NO. | SUBJECT/PAPER | THEORY EXAMINATION | | PRACTICAL EXAMINATION | | DURATION OF UNIV. EXAM | Total Marks |
|--------------|--|--------------------|-------|-----------------------|-------|------------------------|-------------|
| | | INTERNAL | UNIV. | INTERNAL | UNIV. | | |
| 1. | GEN. MEDICINE & PAEDIATRICS | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| 2. | GEN. SURGERY AND OBS & GYNAE | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| 3. | CLINICAL ORTHOPEDICS | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| 4. | CLINICAL NEUROLOGY | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| 5. | RESEARCH METHODOLOGY & BIO-STATISTICS | 30 | 70 | -- | -- | 3 Hrs. | 100 |
| 6. | COMMUNITY MEDICINE | 30 | 70 | -- | -- | 3 Hrs. | 100 |
| 7. | SUPERVISED CLINICAL TRAINING (VIVA VOCE) | -- | -- | 30 | 70 | 3Hrs. | 100 |
| TOTAL | | | | | | | 1100 |

BPT 4th Year

| S.NO. | SUBJECT / PAPER | THEORY EXAMINATION | | PRACTICAL EXAMINATION | | DURATION OF UNIV. EXAM | Total Marks |
|--------------|---|--------------------|-------|-----------------------|-------|------------------------|-------------|
| | | INTERNAL | UNIV. | INTERNAL | UNIV. | | |
| 1. | PHYSIOTHERAPY IN ORTHOPAEDIC CONDITIONS | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| 2. | PHYSIOTHERAPY IN NEUROLOGICAL CONDITIONS | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| 3. | PHYSIOTHERAPY IN GEN. MEDICAL & SURGICAL CONDITIONS | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| 4. | PHYSIOTHERAPY IN CARDIOTHORACIC CONDITIONS | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| 5. | RATIONALE REHABILITATION OF | 30 | 70 | 30 | 70 | 3 Hrs. | 200 |
| 6. | PROJECT (VIVA VOCE) | -- | -- | 30 | 70 | 3Hrs. | 100 |
| 7. | SUPERVISED ROTATORY CLINICAL TRAINING (VIVA VOCE) | -- | -- | 30 | 70 | 3Hrs. | 100 |
| TOTAL | | | | | | | 1200 |

INTERNAL ASSESSMENT

It will be for theory and practical both.

It will be done through the whole year.

Candidate must obtain at least 50% marks in theory in internal assessment to be eligible for the annual university examination.

Internal assessment (Theory) will be done as follows:

- Two Mid-term examinations = 10 marks (5+5)
- Assignments/Projects/Class test/Clinical Presentations = 10 marks
- Attendance = 10 marks

Total = 30 marks

Internal assessment (Practical) will be done as follows:

- Laboratory manual = 10 marks
- Day to day performance = 10 marks
- Attendance = 10 marks

Total = 30 marks

Internal assessment of subjects without practicals will be done as :

- Two Mid-term examinations = 10 marks (5+5)
- Assignments/Projects/Class test/Clinical Presentations = 10 marks
- Attendance = 10 marks

Total = 30 marks

CRITERIA FOR PASSING

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

GRACE MARKS:

If a candidate fails in one subject (theory only) in the annual University examination, Ten grace marks will be given to the candidate by the University before the declaration of result or as per the ordinance. Candidate failing in practical examination will be considered as failed.

SUPPLEMENTARY EXAMINATION:

- a) The re-appear/improvement in End Term Examinations will be with regular End Term examinations.
- b) A student who has to re-appear/improve in a End-Term examination shall be examined as per the syllabus, which was in force at the time when he/she took the examination.
- c) A candidate who fails in a yearly examination shall be exempted from re-appearing in the paper(s) in which he may have obtained min. pass marks. Such a candidate shall be allowed to appear, for passing in the remaining paper(s), only at the next respective yearly examinations.
- d) A candidate who has passed in a paper(s), may be allowed to improve the paper(s), only in the next respective yearly examinations.
- e) The previous internal marks already obtained by the student shall be taken into account without any modification.

DIVISION:

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

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

DEGREE:

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

Internship:

- a) There shall be six months of Internship after the final year examination for candidates declared to have passed the examination in all the subjects.
- b) During the internship candidate shall have to work full time average 7 hours per day (each working day) for 6 Calendar months.
- c) Each candidate is allowed maximum of 6 holidays during entire Internship Program

and in case of any emergencies during which the candidate remains absent for a period more than 6 days, he/she will have to work for the extra days during which the candidate has remained absent.

- d) The Internship should be rotatory and cover clinical branches concerned with Physiotherapy such as Orthopaedics, Cardiothoracic including ICU, Neurology, Neurosurgery, Paediatrics, General Medicine, General Surgery, Obstetrics and Gynaecology both inpatient and outpatient services.
- e) Based on the attendance and work done during posting the Director/Principal/ head of institution/department shall issue '**Certificate of Satisfactory completion**' of training following which the University shall award the Bachelor of Physiotherapy Degree or declare the candidate eligible for the same.

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

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

- a. It is mandatory for the Institution to have its own Physiotherapy clinic fully furnished with all the necessary equipments as per the curriculum of the Program.
- b. Senior Physiotherapist with sufficient clinical experience should manage the physiotherapy departments in the Institutes/Hospitals.

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

B.P.T. 1st YEAR

PAPER - ANATOMY

CODE-B101

THEORY---70

COURSE DESCRIPTION

The study of anatomy will include identification of all gross anatomical structures. Particulars emphasis will be placed on description of bones, joints, muscles, the brain, cardio pulmonary and nervous system, as these are related to the application of physiotherapy and occupational therapy in patients.

Course Objectives:-

- i. Use anatomical terminology to identify and describe locations of major organs of each system covered.
- ii. Anatomical aspects of muscle, bones & joints, & to understand and analyze movements.
- iii. To be able to localize various surface landmarks.
- iv. To understand the anatomical basis of various clinical conditions e.g. Trauma, deformities, pertaining to limbs & spine.
- v. To identify and describe various components and contents of the thorax and abdomen.
- vi. To be able to demonstrate the movements of various joints.
- vii. To be able to distinguish major arteries, veins and Lymphatic with special emphases to extremities and spine.
- viii. To be able to identify and describe the source, course of major arterial, venous and lymphatic system.
- ix. Describe modern technology and tools used to study anatomy.
- x. The identification of the major muscle, nervous and other systems of the body.
- xi. The structure, function and clinical importance of articulations.
- xii. The classification, structure and function of tissues and Explain contributions of organs and systems.

A. INTRODUCTION

1. Define anatomy and mention its subdivisions.
2. Name regions, cavities and systems of the body.
3. Define anatomical positions and anatomical terms.

B. CELL

1. Define a cell.
2. Mention the shape, size and parts of a cell.
3. Name and give function of organs. Names of cell bodies.
4. Define chromosomes, genes
5. Review mitosis and meiosis; Mention the main events, but stages not necessary.

C. TISSUES

1. Classify tissues.
2. Classify and mention the microscopic structure, types of tissues such as epithelial, connective, muscular and nervous tissues.

3. Gives examples for each type of tissue.

D. *CARDIO-VASCULAR SYSTEM.*

1.
 - a. Comprehend the external and internal features of heart and their implications.
 - b. Mention position of hearts.
 - c. Identify and name the chamber of the heart, surface and border of the heart.
 - d. Identify the venae cavae, pulmonary trunk and aorta.
 - e. Mention the internal features of the chambers of the hearts.
2.
 - a. State the basic features of the blood supply & nerve supply of the heart.
 - b. State the basis arrangement of the pericardium.
 - c. Identify the coronary artery and coronary sinus.
 - d. Name the parts of the conductive system of hearts.
3.
 - a. Mention the position and general distribution of major arteries and major veins, and name their main branches.
 - b. Name the types of arteries and veins; give examples and indicate a basic microscopic structure of type of blood vessels.

E. *LYMPHATIC SYSTEM*

1. Comprehend the general and regional arrangements of the lymphatic system.
2. Name the lymphatic organ and mention their location.
3. Illustrate the basic structural features of lymphatic vessels, lymph nodes, thymus, spleen and tonsils.
4. Assign functional role to the lymphatic system.
5. State the position and immediate relations of spleen.

F. *RESPIRATORY SYSTEM.*

1. List the parts of the respiratory system.
2. Comprehend the functional anatomy of the parts of the respiratory systems.
3. Mention the basic features of innervations of bronchi and lungs.
4. State the position, extent, and gross and microscopic structure of the parietal pleura.
5. Comprehend the arrangement of pleura. Mention the parts, and position of the parietal pleura.
6. Name the recesses of pleura.
7. Identify the trachea and bronchi.
8. Identify the right lung and left lung.
9. Name the components of the hilum of lung.
10. Name the broncho-pulmonary segments.
11. Illustrate the main features of the microscopic structure of lung.
12. Identify the borders and surfaces of the lung on the specimen.

G. *DIGESTIVE SYSTEM*

1.
 - a. List the parts of the digestive system.
 - b. Mention the boundaries and features of the mouth.
 - c. Classify teeth.
 - d. Mention, position, extent, subdivision, communications, internal features and muscles of pharynx.
 - e. Name the tonsils.
 - f. Identify internal features of the mouth and pharynx of the specimen.
2.
 - a. State the position, course and extent of esophagus.
 - b. Identify esophagus of the specimen.
 - c. State the basic nerve supply.

3.
 - a. Mention the position and gross structure of the stomach.
 - b. Identify the stomach and its borders, surfaces and subdivisions.
 - c. Enumerate the immediate relations of the stomach.
 - d. State the basic nerve supply of the stomach.
4.
 - a. Name the subdivision of the intestine and mention their positions.
 - b. Mention the difference between small and large intestine.
5.
 - a. Name the arteries arising from the abdominal aorta. Name the organs supplied by these branches.
 - b. Awareness of the name and position of the principles autonomic visceral nerve plexus in the abdomen and pelvis, and the organs supplied by them.
6. Mention the position and gross features of the liver and biliary system.
7. Name the position and subdivision of the pancreas.
8.
 - a. Name the major salivary gland.
 - b. Indicate their positions.
 - c. Mention the site of opening of their ducts.

H. GENITO-URINARY SYSTEM

1.
 - a. Comprehend the basic functional implication and the basic structure of the kidney and ureter.
 - b. Mention the position, size and shape of kidney.
 - c. Name the immediate relations of the kidney.
 - d. Indicate the cortex, medulla, pyramids, sinus, calyces, and pelvis of ureter in macro section of the kidney.
 - e. Illustrate the structure of a nephron.
 - f. Identify the ureter and indicate the position of the ureter.
2.
 - a. State the anatomy of the bladder and urethra.
 - b. Mention the position, shape and size and surface of the bladder.
 - c. Indicate the immediate relations of the bladder.
 - d. Mention the basic innervations of the bladder.
 - e. Name and identify the subdivision the male urethra.
 - f. Mention the position, extent and immediate relations of male urethra.
 - g. Locate and identify the female urethra.
 - h. Mention the position, extent and immediate relations of the female urethra.
 - i. Name the sphincters of the urethra.
3.
 - a. List and locate the parts of the male reproductive system.
 - b. State the anatomy and functional considerations of the testis, male accessory organs of reproduction and external organs.
 - c. Name the constitute structures of the spermatic cord.
 - d. Mention the position of the inguinal canal.
 - e. Name the component structures and parts of the penis.
4.
 - a. List and locate the parts of female reproductive system. State the anatomy and functional considerations of ovary, uterine tubes, uterus, vagina and female external genitalia.
 - b. Mention the basic feature of parts of the female external genitalia.
 - c. Enumerate the factors responsible for the maintenance of the position of the uterus and anatomy of its prolapsed.
 - d. Mention the position, extent and gross structure of the female breast.
5. Name the common, internal and external iliac arteries.

I. NERVOUS SYSTEM:

1.
 - a. Define the subdivisions of the nervous system. Define central, peripheral and autonomic

- nervous systems and name their subdivisions:-Comprehend the position and form of the spinal cord, its structure and function in terms of neuronal connections.
- b. Indicate the position and extent of the spinal cord.
 - c. Illustrate the principles features shown in a transverse section of the spinal cord.
 - d. Specify the basic features of mono and multi synaptic spinal-reflex pathway.
 - e. Illustrate the white and gray matter, and anterior, lateral and posterior columns of the spinal cord.
 - f. Mention the origin, termination and position of important ascending and descending tracts, site of crossing of fiber of these tracts and functions of each tract.
 - g. State the main consequences of spinal cord transaction and hemi section, and explain the rationale of cordotomy.
 - h. Indicate the blood supply and meanings of spinal cord.
2.
 - a. Name the subdivision of the brain, identify and mention the external features of parts of the brain.
 - b. Mention the internal structure and basic features of parts of the brain-stem and name the nuclei and fiber tract with special emphasis of cranial nerve nuclei
 - c. Identify and mention parts of the cerebellum.
 - d. Mention the external features and internal structure of the cerebellum and name its various afferent and efferent tracts and their termination.
 - e. Mention the features of the gross component of the cerebrum.
 - f. Mention & identify the location of gyri, sulci and cortical area.
 - g. State and identify association commissural and projection fibres.
 - h. Define and identify component of forebrain, including cerebral cortex, insula olfactory bulb olfactory tract, uncus, fornix, basal ganglia, thalamus, hypothalamus, internal capsule, corpus callosum etc.
 - i. Predict the result of damage to internal capsule.
 - j. Outline sensory and motor pathway and be able to trace these pathways
 - k. Name sensory and motor nerve endings with function.
 - l. Define pyramidal motor system and name its tracts.
 - m. Define upper and lower motor neurons.
 - n. Name the parts and tracts of the extra pyramidal system and indicate the functions.
 3. Outline the basic of structure of sensory organs:- Nose, tongue, eye, ear and skin.
 4. Briefly outline the nature and basis of muscle tone.
 5. Mention the anatomical pathway involved in the production and maintenance of muscle tone.
 6.
 - a. State the formation, circulation and drainage of CSF
 - b. Locate & identify the ventricles:-
 - c. Identify and name the meninges and space around and locate the cistern.
 - d. Define lumbar puncture and cisternal puncture.
 - e. State the features of the meninges.
 - f. Recognize the difference between extra dural, sub dural and subarachnoid hemorrhage.
 7.
 - a. Outline the arrangement of major blood vessels around the brain and spinal cord.
 - b. Mention the arteries forming the circle of Willis.
 - c. Name the branches of major arteries supplying the brain and spinal cord and mention the parts of brain they supply.
 - d. Predict the result of blockage or rupture of central deep branches.
 - e. Predict. the result of occlusion of cerebral arteries.
 - f. predict the result of occlusion of vertebral or basilar arteries
 - g. Identify and mention the connection of dural venous sinuses.
 - h. Name and identify the parts of the limbic system Mention their function in emotion and

behavior.

8.
 - a. Mention the position and structure of the autonomic nervous system.
 - b. Mention the site of origin and termination of the preganglionic and postganglionic Sympathetic and parasympathetic fibers.
 - c. Name and locate the sympathetic and parasympathetic ganglia.
 - d. Summarize the functional difference between the sympathetic and parasympathetic system.
9.
 - a. Enumerate the cranial nerves in serial order.
 - b. Mention the nuclei of origin & termination and indicate the site of attachment to brain /brain stem.
 - c. Explain the general distribution of the cranial nerves and the course of the VIIIth nerve.
 - d. Predict the result of injury to cranial nerves.
10.
 - a. Anatomy of spinal cord-review
 - b. Name the group of spinal nerves
 - c. Explain the formation and branches of the spinal nerves and distribution of anterior and posterior rami.
 - d. Locate & name the plexuses of nerves.
 - e. Indicate the course and distribution of branches of the plexuses & nerves.

J. ENDOCRINE SYSTEM

1. List the endocrine organs and mention their position.
2. Mention the hormones produced by each endocrine organ.

K. INTRODUCTION TO BONE

1.
 - a. Define the skeleton.
 - b. Mention the subdivision of skeleton. Name the bones in each subdivision.
 - c. Classify the bones and give examples.
 - d. Enumerate the common surface feature of bones.
 - e. Define ossification. Explain the type of ossification and give examples. Define ossification centre .Explain the growth of long bone in length and width.
2.
 - a. When regional anatomy is taught.
 - b. Identify the name and correctly orientate the bone.
 - c. Identify the surface, border and all other surface features.
 - d. Mark and indicate the muscular and ligamentous attachment on the bones.

L. INTRODUCTION TO JOINTS (Arthrology)

1.
 - a. Define a joint or articulation.
 - b. Classify the joints and give example for each type of joint. Define each type of joint.
 - c. Mention the basic feature of a synovial joint.
 - d. Define the axis & movements possible in a synovial joint.
 - e. Define the range of movement and limiting factor.
 - f. Indicate the blood supply and nerve supply in general.
 - g. Define the stability of a joint.
 - h. Demonstrate common movements.
2.
 - a. When regional anatomy is taught:-Mention the type, the articular surface, ligament, movement, axis of movement, chief muscles producing. the movement, limiting factors and nerve supply and blood supply of all individual joints.
 - b. Mention the factors for stability.
 - c. Articulate the bones correctly.
 - d. Indicate applied anatomy for all joints.

M. INTRODUCTION TO MUSCLES (SKELETAL MUSCLE)(Myology)

1.
 - a. Define a skeletal muscle.
 - b. Define fasciae, tendon aponeurosis.
 - c. Classify the skeletal muscles by shapes etc. and give examples.
 - d. Define origin, insertion, muscle work (contraction), types of muscle work, range of muscle work, group action- protagonist, antagonist, synergist and fixator: shunt and spurt muscle; type of levers with examples.
2.
 - a. When the regional anatomy is taught:
 - b. Mention the position, origin, insertion, nerve supply and action of the skeletal muscles. (for the skeletal muscles of soft palate, pharynx and larynx. Position, action, nerve supply may be sufficient).
 - c. Indicate group of muscles by position and action, group action and nerve supply of group of muscles.
 - d. Indicate segment innervations of muscles.
 - e. Predict the result of paralysis of individual and group of muscles.

N. UPPER EXTREMITY

1. Pectoral region:

- a. Outline the features of the pectoral region.
- b. Name, identify and correctly orientate the sternum clavicle, scapula and humerus.
- c. Outline the main features of the bones of shoulder girdle.
- d. Identify the parts, borders and surfaces of sternum mention its other features.
- e. Identify the ends, surfaces, curvatures and other features of clavicle.
- f. Identify the borders, angles, surface, processe, fossa and other features of scapula.
- g. Identify the ends, head, greater and lesser tuberosities and anatomical and surgical necks of humerus: also the capitellum, trochlea and radial, coronoid and olecranon fossa and epicondyles.
- h. Locate and identify the muscles of pectoral region mention their origin, insertion, nerve supply and action.

2. Scapular region:

- a. Comprehend the main features of the muscles in the scapular region.
- b. State the layer, arrangement, of the muscles of the back.
- c. Name and identify the muscles of the scapular region.
- d. Mention their origin, insertion nerve supply and action.
- d. Demonstrate the bony land mark of scapula, humerus and clavicle.

3. Axilla

- a. Mention, identify the boundaries and contents of axilla. Name the branches of axillary artery. Name and identify the cords and branches of brachial plexus and mention their root value.
- b. Illustrate the formation of brachial plexus.

4. Shoulder girdle:

- a. Comprehend and apply the function, the main features of joints of the shoulder girdle.
- b. Name the joints of shoulder girdle. Identify the articular surfaces and name ligaments and movements of sternoclavicular and acromioclavicular joint.
- c. Mention the type of the joints.
- d. Demonstrate and name the movement of scapula. Mention the chief muscles producing

these movements.

- e. Correlate movement of scapula.
- f. Assign functional role of the articular disc and sternoclavicular joint and Coraco-clavicular ligament.

5. Shoulder joint:

- a. Mention the type, articular surface and ligaments of the shoulder joint.
- b. Define and demonstrate the movements of shoulders joint.
- c. Name and identify the chief muscles producing these movements. Analyze these movements and mention limiting factors.
- d. Mention the blood supply and nerve supply of this joint.
- e. Analyze the associate movement of scapula and movement of the shoulder joint.
- f. Mention the limiting factors and factors for its stability indicate applied anatomy.

6. Upper arm:

- a. Name and identify the muscles at the front and back of upper arm.
- b. Name and identify the ends, borders, surfaces and features of the humerus.
- c. Identify the head anatomical neck, tuberosities, surgical neck bicipital groove, condyle, capitulum, trochlea, epicondyles, radial coronoid and olecranon fossa.
- d. Mention the origin, insertion, nerve supply and action of muscles of the front and back of upper arm.
- e. Indicate the course, relation and distribution of radial and musculocutaneous nerves.

7. Elbow joint:

- a. Mention the type, articular surface and ligaments of elbow joint.
- b. Define and demonstrate the movement possible and name the chief muscles producing this movement.
- c. Mention the factors for stability and limiting factors.
- d. Indicate the applied anatomy.
- e. Mention the applied anatomy.
- f. Explain the carrying angle.

8. Forearm, wrist and hand:

- a. Mention the bones of forearm, identify the ends, borders, surfaces and features of radius and ulna.
- b. Identify the head, neck, tuberosity and styloid process of radius. Identify the coronoid process, olecranon process, trochlear notch, tuberosity, head and styloid process of ulna. Also the radial notch of ulna and ulnar notch of radius.
- c. Name and identify the carpal bones, metacarpal bones and phalanges in an articulated hand.
- d. Identify the muscles of front and back of the forearm.
- e. Mention the position, insertion, nerve supply and action of these muscles.
- f. Indicate the course, relations and distribution of median, ulnar and radial nerves.
- g. Mention the type, articular surface and ligaments of radioulnar joints. Define the movements of supination and pronation. Mention the axis and muscles producing these movements. Analyze these movements and apply its functional role in routine day to day actions.
- h. Mention the position and distribution of ulnar and radial arteries and ulnar, median and radial nerves.
- i. Name and locate the carpal bones. Mention the type, articular surface and ligaments of the

wrist joint.

- j. Define and demonstrate the movements and mention the muscles producing them.
- k. Mention the blood supply and nerve supply.
- l. Mention the visible tendons around the wrist and their synovial sheaths.
- m. Predict the result of paralysis of muscles of the forearm.
- n. Mention the functional implication of prehension in the structure of hand.
- o. Indicate the arrangement of tendons of the digits, retinaculae, fibrous flexor sheaths, and synovial sheaths.
- p. Evaluate the hinge type of interphalangeal joints, ellipsoid type of metacarpophalangeal joints and saddle type of carpo-metacarpal joint.
- q. Name and identify the small muscles of the hand. Mention their position, origin, insertion, nerve supply and action.
- r. Mention the types of bones forming and ligaments of the joints of the hand. Define movements and the muscles producing these movements. Predict the results of paralysis of the small muscles of hand.
- s. Demonstrate the types of grip.

9. Nerves of upper limb.

- a. Comprehend and apply the knowledge of the position and distribution of blood vessels and lymph nodes.
- b. Mention the root value of the nerves.
- c. Identify the nerves and mention the position, course, relations and distribution of nerves of upper limb.
- d. Predict the result of injury to these nerves.

10. Blood vessels of upper limb:

- a. Comprehend and apply the knowledge of the position and distribution of blood vessels and lymph nodes.
- b. Trace the main arteries and veins.
- c. Indicate their position and name the main branches of tributaries.
- d. Name and locate the lymph nodes.

11. Cutaneous nerves of upper limb:

- a. Name the cutaneous nerves and illustrate the areas of their distribution.
- b. Illustrate the dermatome.

O. LOWER EXTREMITY

- 1.
 - a. Name, identification and orientation of hip bone, femur, tibia, fibula and patella.
 - b. Identify the component and features of hip bones. Identify the ends, borders, surfaces, head, neck, trochanters, condyles and epicondyles of femur and the features of the tibia and fibula.
 - c. Identify and mention the origin, insertion, nerve supply and action of the muscles in the front of thigh.
 - d. Mention the boundaries and contents of femoral triangle and sub sartorial canal.
 - e. Indicate the position, course and distribution of femoral nerve.
 - f. Indicate the course and main branches of femoral artery and mention the blood supply of neck of femur.
 - g. Indicate the position of femoral vein.
- 2. **Medial side of the thigh:**
 - a. Name and identify the muscles of the medial side of thigh. Mention their origin, insertion,

- nerve supply and action.
- b. Indicate the course, relations and distribution of obturator nerve.
- 3. Back of thigh**
- a. Identify and mention the position, origin, insertion, nerve supply and action of the hamstring muscles.
- b. Indicate the position, course, relation and distribution of sciatic nerve.
- 4. Gluteal region:**
- a. Identify and mention the position, origin, insertion, nerve supply and action of the muscles.
- b. Name and mention the position and course of the nerves found there and name the arteries there.
- 5. Hip joint:**
- a. Mention the type, articular surface and ligaments.
- b. Define the movement and name the chief muscles producing the movements.
- c. Mention the blood supply, nerve supply, factor for stability and limiting factors. Indicate applied anatomy.
- 6. Knee joint:**
- a. Mention the type, articular, surfaces and ligaments.
- b. Define the movements and name the chief muscles for the movements.
- c. Analyze the movements.
- d. Know the blood supply and nerve supply.
- e. Indicate applied anatomy.
- f. Define locking and unlocking of the joint.
- 7. Popliteal fossa:**
- a. Indicate the boundaries and contents.
- b. Mention the position and branches of tibial and common peroneal nerves.
- 8. Front of leg and dorsum of foot:**
- a. Name and identify the tarsal bones, metatarsal bones and phalanges in an articulated foot.
- b. Name and identify the muscles.
- c. Mention the positions, origin, insertion, nerve supply and action of the muscles.
- d. Position and distribution of deep peroneal nerve.
- e. Indicate the position and attachment of extensor retinacula.
- f. Mention and identify the feature of the tibia and fibula.
- 9. Lateral side of leg**
- a. Name and identify the muscles.
- b. Mention the position, origin, insertion, nerve supply and action of muscles.
- c. State the position, course and distribution of superficial peroneal nerve.
- d. State the position and attachment of peroneal retinacula.
- 10. Back of leg and sole of foot.**
- a. Name and identify the features of the bones of the foot.
- b. Name and identify the muscles of back of leg.
- c. Mention the position, arrangement, origin, insertion, nerve supply and action of the muscles.
- d. State the position course and distribution of tibial artery.

- e. State the position course and distribution of posterior tibial artery.
- f. Mention the position, and attachment of flexor retinaculum.
- g. Mention the arrangement, origin, insertion, nerve supply and action of muscles of the foot.
- h. Indicate the type of formation and factors for the maintenance of the arch of foot.
- i. Mention the type, articular surface, ligaments, movements chief muscles for the movement. Axis of movements and applied anatomy of tibiofibular joints, ankle joints, subtalar joints, M.P. joints, I.P. joints.
- j. Palpate and identify the tendons around the ankle and dorsum of foot.

II. Nerves:

- a. Indicate the position, formation and branches of lumbar and sacral plexuses.
- b. Mention the root value of the nerves.
- c. Mention the position, course, relation and distribution of nerves.
- d. Predict the result of injury to the nerves
- e. Illustrate cutaneous innervations of dermatomes.

12. Blood vessels:

- a. Indicate the position of arteries and their main branches.
- b. Indicate the position of veins and their main tributaries.
- c. Indicate the position of lymph nodes.

P. TRUNK-THORAX-ABDOMEN

1. Vertebral column:

- a. State the basic osteology of vertebral column.
- b. Identify the parts of typical vertebra, identify and state the main features of typical vertebra of each group of vertebra Identify a typical vertebrae.
- c. State the form, structure and movements of joints of vertebrae column. Mention the movements and the muscles producing them.
- d. Identify the intervertebral disc and mentions its parts.
- e. State the formation and ligaments of the intervertebral joints
- f. Name and identify the curvatures of the vertebral column and indicate deformities.
- g. State the contents of vertebral canal

2. THORAX:

- a. State the main features of the bones and joints of thoracic cage. Mention the boundaries.
- b. State the parts and features of sternum.
- c. Define true, false and floating ribs. Mention the parts of features of typical ribs. Know the main features of typical ribs.
- d. Mention the type and formation of the joint between rib and vertebra, between costal cartilage and sternum and between costal cartilages.
- e. Mention the type and formation of the joint between parts of sternum. Indicate the importance of sternal angle.
- f. Analyze pump handle and bucket handle movement of ribs.
- g. Palpate bony land marks such as jugular notch, sternal angle, xiphi sternum and spine of thoracic vertebral.
- h. Define intercostals space and list the contents. Mention the course and branches of typical intercostals nerve.
- i. Name the muscles of thorax. Mention the origin insertion, nerve supply and action of intercostals muscles and diaphragm.

- j. Name the structures passing through the diaphragm and mention the orifices in the diaphragm.
- k. Define the boundaries, and subdivision of the mediastinum and list the contents, Identify the contents.
- l. State the features of thoracic parts of sympathetic trunk.

3. Abdomen:

- a. Mention the main features of lumbar vertebra, sacrum and coccyx.
- b. Mention the formation and subdivision of bony pelvis list the features of the female bony pelvis and their role.
- c. Mention the type, articular surface, ligaments and movements of the joints of pelvis.
- d. Define abdominal cavity.
- e. List the layers of anterior abdominal wall. Name and mention the origin, insertion, nerve supply and action of the muscles and the features of these muscles.
- f. Explain the formation of rectus sheath and list its contents.
- g. Define inguinal canal and know its position, extent, formation and contents.
- h. Indicate its clinical importance. Define inguinal hernia.
- i. Name and identify the muscles of posterior abdominal wall. Give their origin, insertion, and action. List the organ on the posterior abdominal wall. Name the blood vessels on the posterior wall.
- j. Mention the position and formation of lumbar plexus. Name its branches,
- k. State the anatomy of lumbar region. Understand the disposition of muscles of the layers. Mention the arrangement of lumbar fascia. Identify the muscles in lumbar region.
- l. Understand the lumbar routes to abdomen. Identify and mention the attachments and action of the large muscles of back.
- m. Distinguish abdominal cavity and peritoneal cavity.
- n. Mention the features of lumbar part of sympathetic trunk and other sympathetic ganglia.
- o. Mention the branches and distribution of the abdominal aorta and iliac arteries.
- p. State the inferior vena cava and iliac veins and mention their tributaries.

4. PELVIS

- a. State the main features of subdivision, boundaries, walls and floor of pelvis
- b. Mention the features of the pubic symphysis and sacroiliac joints.
- c. Distinguish and mention and major difference between the male and female pelvis.
- d. Identify the muscles of the pelvic floor and mention their attachments, actions and nerve supply.
- e. Mention the structure of the urogenital diaphragm.

Q. HEAD AND NECK

- I. Identify the anterior and posterior triangles of neck. Name the subdivision. List the contents.
 - a. State the main features of the skull and facial skeleton.
 - b. Identify the large skull bones and their parts.
 - c. Identify the cranial fossa and hypophyseal fossa.
 - d. Identify the internal and external auditory meatuses, foramen magnum and stylomastoid foramen and name the main structures passing through them.
 - e. Identify the name the main muscles of the face. Mention their nerve supply and action.
 - f. Predict the result of paralysis to the facial muscles and sequel of injury to the facial nerve (VII nerve)
 - g. Map the cutaneous distribution of the three divisions of the trigeminal (Vth) nerve on

the face.

2. Identify the general feature of a typical cervical vertebra, atlas, axis and seventh cervical vertebra.
 - a. Identify the erector spinae, sternomastoid and scalene muscles, glenohyoid. Mention their attachments, actions and nerve supply.
 - b. Identify the phrenic, accessory and vagus nerves. Mention their distribution.
 - c. Identify the state the position distribution and root value of the nerves of cervical and brachial plexuses.
 - d. Demonstrate the action of sternomastoid.
 - e. Mention the type, articular surfaces, ligaments, movements and muscles producing these movements, at the atlanto-occipital and atlanto-axial joints.
 - f. Demonstrate these movements and the movements of the cervical part of vertebral column
 - g. Identify the subclavian, vertebral and carotid arteries. Mention the position and extent of these arteries.
 - h. Identify the components of the circle of willis, Mention the distribution of internal and external carotid and vertebral arteries. Predict the sequelae of Occlusion of these arteries.
 - i. Identify the internal jugular and subclavian veins. Mention their position, formation and termination.
3. Describe the following:-
 - a. Brain, its parts, blood supply & functional areas.
 - b. State the basic organization of the autonomic nervous system.
 - c. State the sites of craniosacral and thoraco-lumbar outflow.
 - d. Define the mode of the distribution of pre and post. Ganglionic efferent neurons in sympathetic and parasympathetic nervous system.
 - e. Name the cranial nerves containing para sympathetic system in relation to their function.
 - f. Distinguish between sympathetic & parasympathetic system in relation to their function.

R. EYE:

- a. State the position of the lacrimal apparatus, the functional, implication of structure of the eye and the lacrimal apparatus.
- b. Name and illustrate the coats, their subdivisions, the refractive media, the chambers of the eye and the optic nerve.
- c. Mention the structure of retina and optic pathway.
- d. Has a basic understanding of the light and accommodation reflex (omitting pathway)
- e. Mention the distribution of the three divisions of trigeminal (Vth) nerve.
- f. Name and state the nerve supply and simple actions of the extra ocular muscles.
- g. Predict the result of lesions of 3rd, 4th and 6th cranial nerve.

NOSE:

- a. Name the bony component of the nose.
- b. Mention the parts and boundaries of the nose.
- c. State the main features of the nasal cavity.
- d. Name and identify the para nasal air, sinuses and locate their opening.

S. Temporomandibular joint.

- a. State the type, articular surface, ligaments, possible movements, muscles performing the movements and nerve supply of the Temporomandibular joint.
- b. Palpate and identify the joint and its articular surfaces.
- c. Identify and name the muscles of mastication. Mention their action and nerve supply.

T. Mouth:

- a. State the main features of the mouth cavity tongue, palate salivary glands, teeth and gums.
- b. Mention the sensory and motor innervations of the tongue.
- c. Identify the salivary glands.
- d. Demonstrate movements of the tongue and palate.
- e. Test and produce the swallowing (gag) reflex.
- f. Predict the sequelae of lesions of the VIIth and XIIth cranial nerves.

U. Pharynx:

- a. State the position and extent of the pharynx.
- b. State the three subdivisions and the features of each subdivision.
- c. Name the muscles of pharynx and their action.
- d. Mention the sensory and motor innervations of the pharynx.

V. LARYNX AND TRACHEA.

- a. Identify the hyoid and state its parts
- b. Identify the larynx and name the laryngeal cartilages.
- c. State the boundaries of laryngeal inlet and glottis.
- d. Identify the vocal and vestibular folds.
- e. State the movements of the laryngeal cartilages. Name the laryngeal muscles and mention their attachments, action and nerve supply.
- f. Define the position, extent and gross structure of the trachea.
- g. State the mechanics of phonation and speech, production of voice and speech.

W. Ear:

- a. State the basic structural plan of the organs of hearing and equilibrium.
- b. Mention the three subdivisions of the ear.
- c. Mention the nerve ending for hearing and equilibrium.

X. Cranial nerve

- a. Enumerate the cranial nerves in serial order.
- b. Relate interpret the number to the name.
- c. Indicate the nuclei of origin of termination.
- d. Mention the attachments of the brain and the cranial exit.
- e. State the sensory and motor distribution.
- f. State the position and course of VII nerve.

- g. Predict the sequel of lesion.

ANATOMY PRACTICAL

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

BOOK REFERENCE

1. Grays Anatomy
2. Human Anatomy- Snell
3. Anatomy – BD Chourasiya, Volume-I,II, & II
4. Human Anatomy – Kadasemn Volume –I , II & III
5. Human Anatomy- Dutta

B.P.T. 1st YEAR

PAPER - PHYSIOLOGY

CODE-B102

THEORY---70

Course Description:

The course is designed to assist the students to acquire knowledge of the normal. Physiology of various body systems and understand the alternation in physiology in disease and practice of Physiotherapy as applicable for each systemic disorder.

Course Objectives:-

- i. The students will have an enhanced knowledge and appreciation of mammalian physiology;
- ii. Students will understand the functions of important physiological systems including the cardio-respiratory, renal, reproductive and metabolic systems;
- iii. They will understand how these separate systems interact to yield integrated physiological responses
- iv. to challenges such as exercise, fasting and ascent to high altitude, and how they can sometimes fail;
- v. The students will be able to perform, analyse and report on experiments and observations in physiology;
- vi. They will be able to recognise and identify principal tissue structures;
- vii. The students will have understanding of alternation in physiology in disease and practice of Physiotherapy as applicable for each systemic disorder.

A. Cell Physiology

1. Cell structures, functions and homeostasis.
2. Cell membrane permeability and transport mechanisms.
3. Bioelectric potentials.

B. Muscle & Nerve

1. General introduction types of responses by living organism, essentials of a system to produce movements. Structure of neuron neuromuscular junction and synapse.
2. Electrophysiology of nerve and muscle. Generation conduction and transmission of nerve impulse.

3. Classification of nerve fibers.
4. Properties of nerve fibers, strength duration curve, accommodation.
5. Structure and properties of different types of muscle.
6. Physiology of neuromuscular transmission. Site and mode of action of blocking substances of neuromuscular transmission. Excitation- contraction coupling and molecular basis of muscle contraction, mechanisms of muscle contraction. Twitch summation, length tension relationships-isotonic and isometric contraction. Factor affecting muscle tension.
7. Energetics of muscle contraction.
8. Degeneration and regeneration of nerve, lower motor neuron and its lesions, nutrition of muscle and effects of training. Electromyography, patho-physiology of paralysis, paresis, peripheral neuritis, defects of neuromuscular transmission.

C. Blood:

1. Composition and functions of blood plasma proteins, functions. Red blood cell-site of production, function.
2. Erythropoiesis and regulation, physiological and pathological variations.
3. Hemoglobin function, abnormal hemoglobin, haemolysis and jaundice. Leucocytes, functions and leucopoiesis.
4. Platelets –role in haemostasis, coagulation of blood, anticoagulants and fibrinolytic system, bleeding disorders, thrombosis.
5. Inflammation, Lymphocytes and cellular immunity.
6. Blood groups and blood transfusion.
7. Blood volume, methods of measurement.

D. Autonomic nervous system.

1. Sympathetic and parasympathetic nervous system.
2. Transmission at ganglia and post ganglionic terminals and autonomic reflexes.

E. Respiratory system.

1. Introduction functional anatomy, functions respiratory and non respiratory.
2. Mechanics of respiration inspiration, expiration, intra alveolar and intra pleural pressures, pneumo thorax. Pulmonary ventilation, airways resistance, compliance, work of breathing,
3. Lung volumes and capacities. Gas law, partial pressures. Gas tension, Alveolar ventilation, composition of inspired alveolar and expired gases.
4. Dead space of Anatomical and physiological perfusion-ventilation relationship and diffusion capacities. O₂ Transport and O₂ dissociation curve. Carbon dioxide transport and factors affecting.
5. Control of respiration organization of respiratory centers, neural regulation.
6. Control of respiration chemical apnoea, Hypoxia, asphyxia, hyperpnoea cheyne stokes breathing, hypercapnia, hypocapnia, respiratory failure, Dyspnoea and cyanosis.

F. Cardiovascular system

1. Properties of cardiac muscle, functional tissues, effects of ions on cardiac muscle. Origin and spread of cardiac impulse, resting membrane potential, pace maker potential and action potential.
2. Electrocardiography
3. Cardiac cycle pressure volume changes, Heart sounds, pulse arterial and venous relationship with cardiac cycle. Cardiac output determination, regulation. Heart rate, its regulation
4. Haemodynamics
5. Blood pressure, measurement, regulation- short term, intermediate and long term.

6. Venous circulation flow, pressure and factors affecting venous circulation, central venous mechanism, venous circulation-flow, pressure, factor affecting, central venous pressure. Microcirculation. Coronary circulation and patho physiological considerations. Regional circulation-pulmonary, cerebral, fetal, placental.
7. Shock, syncope, heart failure, hypertension and hypotension.
8. Physiology of exercise.
9. The lymphatic system, interstitial fluid dynamics and edema.

G. Gastro intestinal system.

1. Introduction, functional anatomy, mastication and swallowing.
2. Physiology of gastro-intestinal secretions in general, Functions and regulation of gastric, Pancreatic, intestinal and bile secretions. Movement of alimentary canal, gastric emptying and intestinal movements
3. Defecation. Assessment of functions gastric pancreatic and intestinal juice, vomiting, peptic ulcer, dumping syndrome, diarrhea and constipation.

H. Nervous system.

1. General

- a. Functional organization of the nervous system, encephalization and role in homeostasis.
- b. C.S.F.-Site and mechanism of formation, circulation, functions and Blood CSF and blood brain barriers-clinical significance.
- c. Synapse-properties, neurotransmitters, pre and post synaptic events.

2. Sensory

- a. Receptors, definition, classification, transducer action, generation of potentials, properties, stimulus and strength relationship, modality of sensations and classification of sensations.
- b. Specific sensations, sensory and other ascending pathways, somesthetic sensations, proprioceptions and kinesthesia.
- c. Pathophysiology of pain and headache.
- d. Thalamus- organization, connections, role in sensory functions, motor co-ordinations, autonomic and emotional behavior, sleep, consciousness and thalamic syndrome.
- e. Cerebral cortex-sensory and motor organization, somatotopic representation, tactile localization and discrimination, stereognosis.

3. Motor

- a. Functional organization of motor system.
- b. Reflex action, properties and their significance. Stretch reflex, muscle spindle, role of gamma motor neuron, static and dynamic responses, polysynaptic reflexes.
- c. Reciprocal innervations, crossed extensor reflex, positive and negative supporting reaction.
- d. Cortical motor areas, pyramidal and extra pyramidal systems.
- e. Reticular formation- organization ascending and descending components.
- f. Basal ganglia organization, circuits function and disorders.
- g. Role of bio-amines. Regulation of tone and posture –postural reflexes spinal decerebrate, thalamic and decorticate preparations.
- h. Cerebellum-Functional anatomy, functions and pathology of sensory-motor mechanisms spinal cord lesions transection, hemi section, upper motor neuron lesion.
- i. Posterior column defects.
- j. Hypothalamus –Functional anatomy, connection and functions. Role in homeostasis. Limbic system-Components role in visceral, somatic and endocrinal activities, preservation

of self and species, and psychosomatic implications.

4. Higher Nervous Function

- a. Condition reflex, properties, neural basis, relation to learning memory and habit formations.
- b. Learning and memory higher intellectual functions, Communication and speech and disorders.
- c. Electroencephalogram- neurophysiologic basis, relation to sleep and wakefulness and clinical applications.

5. Special Senses

- a. Eye-functional anatomy, intra-ocular fluid pressure and clinical significance, optic of vision, schematic eye, accommodation, errors of refraction and aberrations.
- b. Photoreceptor mechanisms, theories of vision, dark and light adaptations and color vision.
- c. Visual pathways, central mechanism of vision & visual reflexes. Field of vision, lesions of optic pathways.
- d. Ear-functional anatomy, sound wave characteristics. Transmission of sound, attenuation reflex. Physiology of internal ear, organ of corti, analysis of pitch and loudness, Cochlear micro phonics. Auditory pathways, central mechanisms of hearing, auditory cortex, hearing defects.
- e. Vestibular apparatus & its functions. Clinical significance of nystagmus, motion sickness.
- f. Physiology- taste and smell.

6. Kidney and Body Fluids

- a. Introduction, functional anatomy and functions in general including non excretory functions.
- b. Glomerular functions, filtration and its regulation.
- c. Function of renal tubule –re absorption, secretions, renal clearance & transport mechanism.
- d. Role of kidney in fluid balance, electrolytes and non electrolytes. pH and osmolarity. Physiology of micturition.
- e. Renal function tests.
- f. Body fluids- distribution, volume and regulation.
- g. Patho-physiology of kidney-Renal failure - Artificial Kidney Diuretics.

7. Endocrinology

- a. Introduction, Hormone-definition,
- b. Method of study.
- c. Role of endocrine system in homeostasis, hypothalamic hypophyseal axis. Target tissue-negative and positive feed –back control system. Influence of external environmental on the endocrine system.
- d. Physiology of pituitary gland- Adenohypophysis & neurohypophysis.
- e. Physiology of thyroid gland, thyroid function tests.
- f. Physiology of adrenal gland. Adrenal cortex function and function tests, Adrenal medullary hormone.
- g. Functions of parathyroid, regulation, Hypo and Hyperactive parathyroid states.
- h. Pancreas-insulin, glucagon, somatostatin (physiological aspects) pineal gland, Thymus, local hormones prostaglandin.

8. Reproduction

- a. Introduction, an overview of preservation of species as against preservation of self,

puberty, sex drive, menopause, cyclic activities in females, no cycling activities in male, spermatogenesis, ovulation.

- b. Reproduction in males, testes structure, spermatogenesis, seminal fluid, ejaculation. Testicular hormones-, functions and regulation, hyper and hypoactive states of male gonad.
- c. Ovarian function-structure, oogenesis follicular growth, ovulation, function of corpus luteum. Female sex hormone, function and regulation.
- d. Menstrual cycle neurohormonal basis, hypothalamic-hypophyseal –gonadal axis, changes accessory organs, effect on behavior.
- e. Fertilization, implantation functions of placenta. Physiology of pregnancy and parturition, changes in reproductive organs and different systems of the body.
- f. Physiology of lactation, mamogenesis, galactopoiesis, secretion and ejection of milk, & lactation.
- g. Amenorrhea.
- h. Foetal and placental circulation.

9. Skin

Structure, blood circulation, functions, temperature regulation.

10. Environmental Physiology

Altitude, space and underwater physiology.

11. Applied physiology

- a. Effects of heat and cold (localized and generalized).
- b. Effects of electrical stimulation on skin, muscle and nerves, Effect of mechanical pressure.
- c. Effect of local and general exercise.
- d. Compensation and training in nervous system.
- e. Effects of various sensory proprioceptive stimuli etc.

PHYSIOLOGY PRACTICAL

1. Examination of pulse
2. B.P.
3. Respiratory rate.
4. Reflexes
5. Spirometry to measure various lung capacities & volumes.
6. Respiratory rate,
7. Tidal volume, IRV, IC, ERV, EC, residual volume on Spirometry.
8. Estimate of Haemoglobin
9. R.B.C., W.B.C., TLC, DLC, ESR count.
10. Blood indices, Blood grouping.
11. Bleeding & Clotting time.

Book Reference:-

1. Concise medical physiology- Dr. S.C. Choudhary.
2. Human physiology-Dr. C.C. Chatterjee.
3. Samsan writes applied physiology handbook –Cyril a keele eric B. Neil.
4. Best and Taylor's physiological basic of Medical practice- C.H. Best et.al.
5. Textbook of Medical physiology- Guyton and hall.
6. Review of Medical Physiology – William F. Ganong.

B.P.T. 1st YEAR

PAPER - BIOCHEMISTRY
CODE-B103
THEORY---70

Course Objectives:-

- I. The student will be able to identify the structural elements of proteins, the basic features of Enzyme catalysis and regulation, and the function of hemoglobin in oxygen binding and transport.
- II. The student will be able to describe the basic structural features of nucleic acids, the mechanisms by which DNA is transcribed, replicated, and repaired, and how proteins are encoded in mRNA and synthesized by translation
- III. The student will have an understanding of the metabolic processes by which energy is produced in cells and amino acids, lipids, purines and pyrimidines, and carbohydrates are synthesized.
- IV. The student will be able to describe the roles of vitamins in metabolic processes and enzyme activity.
- V. The student will have an understanding of the basic elements of intercellular signal transduction pathways, including nuclear receptors and cell surface receptors.
- VI. The student will be able to describe the cellular pathways by which proteins are trafficked to cellular organelles, inserted into the cell membrane, and secreted from the cell.

| UNIT | CONTENTS |
|---|---|
| Cell & Sub cellular organelles | Structure & function of Cell & Sub-cellular organelles Biochemical characteristics of living matter, Physiochemical Phenomena & their significance (Osmosis Diffusion, Donnan Membrane equilibrium), Structure organization of plasma membrane & transport systems. |
| Definition, Structure, Functions & classification of Biological Macromolecules. | Carbohydrates, Lipids & Fatty acids, Nucleic acids, Amino acids & Proteins, Plasma proteins. |
| Enzymes | Classification & Mechanism of action, factors affecting enzyme activity, Enzyme kinetic, Enzyme inhibition, Coenzymes, Allosteric enzymes, Diagnostic significance of enzymes & isoenzymes. |

| | |
|--|--|
| Digestion & Absorption | Carbohydrates, Lipids, Proteins & Nucleic acids. |
| Biological oxidation & Bioenergetics. | Concepts of free energy change, Exergonic & Endergonic reactions, Biological oxidation, Electron transport chain, Oxidative phosphorylation, inhibitors & uncouplers of electron transport chain & Oxidative phosphorylation. |
| Metabolism | Introduction of intermediary metabolism & stage of catabolism. |
| Metabolism of Carbohydrates | Carbohydrate metabolic pathways such as Glycolysis, Gluconeogenesis, TCA cycle, HMP shunt pathway, Glucuronic acid pathway & Glycogen metabolism with their physiological importance, Interconversion of different sugars, Metabolic integration, Regulation of blood Glucose level, DM. |
| Metabolism of Lipids & Lipoproteins | B-Oxidation & synthesis of fatty acids, Metabolism of Ketone bodies, Metabolism of Cholesterol & Lipoproteins with their clinical implications, Fatty liver & lipotropic factors. |
| Metabolism of proteins & amino acids. | Transmission, Deamination, Decarboxylation of amino acids, Fate of ammonia (Liver & Brain), Urea cycle, Metabolism of aromatic amino acids & inborn errors of metabolism, Biologically important peptides & specialized products derived from amino acids. |
| Nucleic Acid metabolism & molecular biology. | Synthesis & catabolism of purines & pyrimidines gout, Nucleosides, Nucleotides & Biologically important nucleotides, Replication, Transcription, Translation & inhibitors of protein synthesis. |
| Organ function tests | Liver, Pancreatic & Gastric |
| Biochemistry of tissues | Connective tissue, Nerve tissue & Muscle. |
| Kidney | Concepts of buffers, Ph & Body buffers, Mechanism of urine formation, Water, electrolyte & acid base balance, Kidney function tests. |
| Biochemical Endocrinology | General characteristics & Classification of hormones, Mechanism of action and metabolic effects of hormone of Pituitary, Thyroid, Parathyroid, Adrenal & Pancreas. |
| Nutrition & Dietetics. | Proximate principles of food & their physiological importance, Caloric requirements & Computation of diet, Balance diet, BMR & factors affecting BMR, SDA & its significance, RQ, Nitrogen balance, Malnutrition (Kwashiorkor & Marasmus), Obesity, diet in health & disease, Role of dietary fiber, Metabolism in exercise. |

| | |
|--|---|
| Vitamins | Dietary source, Daily requirements, Biochemical function & deficiency diseases of water soluble & fat soluble vitamins. |
| Mineral Metabolism | Dietary sources, Daily requirements, Biochemical functions & deficiency diseases of Iron, Zinc, Copper, Calcium & Phosphorus. |
| Interpretation of common clinical biochemistry investigations. | Sugar, Urea, Creatinine, Protein, Bilirubin, Uric acid, Cholesterol. |

SUGGESTED TEXT BOOKS

1. Text Book of Biochemistry by Harbans Lal
2. Essentials of medical biochemistry by R.C. Gupta
3. Harper's Illustrated Biochemistry by Murry et.al. 26 Ed.
4. Text Book of Biochemistry by D.M. Vasudevan and sreekumari S. 4th Ed.
5. Biochemistry by U. Satyanarayana II Ed.

B.P.T. 1st YEAR

PAPER - SOCIOLOGY

CODE-B104

THEORY---70

Course Objective:-

- i. The students will be able to understand the Sociology in depth.
- ii. The students will be able to understand about the role of sociology in health & physiotherapy.
- iii. The students will be able to understand about family, culture and community.
- iv. The student will be able to understand about caste system & socialization.
- v. The students will be able to understand about the social problems.

A. Introduction:

Definition of sociology, sociology as a science of society, uses of the study of sociology, application of knowledge of sociology in physiotherapy and occupational therapy.

B. Sociology & health:

Social factors affecting health status, social consciousness and perception of illness, social consciousness and meaning of illness, decision making in taking treatment. Institution of health of the people.

C. Socialization:

Meaning of socialization, influences of social factor on personality socialization in hospitals, socialization in rehabilitation of patients.

D. Social Group:

Concept of social group, influence of formal and informal groups on health and sickness, the role of primary groups and secondary groups in the hospitals and rehabilitation setting.

E. Family:

Influence of family on human personality, discussion of changes in the function of a family, influence of family on the individual's health family and nutrition, the effect of sickness on family, and psychosomatic disease.

F. Community:

Concept of community, role of rural and urban communities in public health, role of community in determining beliefs, practices and home remedies in treatment.

G. Culture:

Components of culture, impact of culture on human, behavior, culture meaning of sickness, response & choice of treatment (role of culture as social consciousness in molding the perception of reality) culture induced symptoms and disease, sub-culture of medical workers.

H. Caste system:

Feature of modern caste system and its trends.

I. Social change:

Meaning of social change, factors of social change, human adaption and social change, social

change and stress, social change and deviance, social change and health programs, the role of social planning in the improvement of health and in rehabilitation.

J. Social control:

Meaning of social control, role of norms, folkways, customs, morals, religion, law and other means of social control in the regulation of human behavior, social deviance and disease.

K. Social problems of the disabled:

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

- a) Population explosion
- b) Poverty and unemployment
- c) Beggary
- d) Juvenile delinquency
- e) Prostitution
- f) Alcoholism
- g) Problems of women in employment.

L. Social Security: Social security and social legislation in relation to the disabled.

M. Social Worker: The role of medical social worker.

Books Recommended:

- 1. Megee- sociology-Drydon press Illinois.
- 2. Kupuswamy- Social Changes in India –Vikas, Delhi
- 3. Ahuja- Social problems-Bookhive, Delhi
- 4. Gihnsberg- Principles of sociology-sterling publications.
- 5. Parter & Alder- Psychology & sociology applied to medicine- W.B. Sanders.
- 6. Julian- Social Problem- Prentice hall.

B.P.T. 1st YEAR

PAPER – GENERAL & CLINICAL PSYCHOLOGY

CODE-B105

THEORY---70

Course Objective:-

- i. The students will be able to understand the Psychology in depth.
- ii. The students will be able to understand about the role of Psychology in health & physiotherapy.
- iii. The students will be able to understand about thinking, behavior and personality.
- iv. The student will be able to understand about clinical psychology.
- v. The students will be able to understand about the psychological disorders.

Section- I

GENERAL PSYCHOLOGY

1. **Definition of psychology:** Definition of psychology, in relation to following schools method and branches
 - a. Schools: Structuralism, functionalism, behaviorism, psychoanalysis, Gestalt psychology.
 - b. Methods: Introspection, observation, inventory and experimental method.
 - c. Branches: General, child, social, abnormal, industrial, clinical, counseling, educational.
2. **Heredity and Environment:** Twins relative importance of heredity an environment, their role in relation to physical characteristics, intelligence and personality, nature- nature controversy.
3. **Development and growth behavior:** Infancy, childhood, adolescence, adulthood, middle age, old age.
4. **Intelligence:** Definition, IQ, Mental age, list of various intelligence tests- WAIS, WISC, and Bhatia's performance test, raven's Progressive Metrics test.
5. **Motivation:** Definition, motive, drive, incentive and reinforcement, basic information about primary needs: hunger thirst, sleep elimination activity, air avoidance of pain, attitude to sex. Psychological needs: Information, security, self esteem, competence, love and hope.
6. **Emotions:** Definition: differentiate from feelings, psychological changes of gland, heredity and emotion, nature and control anger, fear and anxiety.
7. **Personality:**
 - a. Definitions: List of components: physical characteristics character, abilities temperament, interest and attitudes.
 - b. Discuss briefly the role of heredity, nervous system, physical characteristics, abilities, family and culture of personality development.
 - c. Basic concept of Freud: Unconscious, conscious, id ego and supergo, list and define the oral, anal and phallic stages of personality department list and define the stages as

proposed by Erickson, 4 concept of learning as proposed by Dollard and Miller, drive cue, response and reinforcement.

d. Personality assessment: Interview, standardized, non-standardized, exhaustive, and stress interviews, list and define inventories BAI, CPI and MMPI, projective test. Rorschach, TAT and sentence completion test.

8. **Learning:** Definition: List the laws of learning as proposed by Thorndike, type of learning: Briefly describe classical conditions, operant conditioning, insight observation and trial and error type. List the effective ways to learn: Massed Vs. spaced, whole vs. part, Recitation Vs reading, serial Vs. International learning, role of language.
9. **Thinking:** Definition, concepts creativity, steps in creative thinking, list the traits of creative people, delusions.
10. **Frustration:** Definition, sources, solution, conflict, Approach, Avoidance and approach- Avoidance solutions.
11. **Sensation, Attention and perception.**
 - a. List of senses: Vision, Hearing, Olfactory, Gustatory and cutaneous sensation, movement equilibrium and visceral sense. Define attention and list factors that determine attention: nature of stimulus intensity, color, change, extensity, repetition, movement size, curiosity, primary motives.
 - b. Define perception and list the principles of perception: Figure ground, constancy, similarity, proximity, closure continuity values and interests, past experience context, needs moods, religion, sex and age, perceived susceptibility perceived seriousness, perceived benefits and socioeconomic status.
 - c. Define illusion and hallucination.
 - d. List visual, auditory, cutaneous, gustatory and olfactory hallucination.
12. **Democratic and Authoritarian Leadership:** Qualities of leadership: physical factors intelligence, self –confidence, sociability, will and dominance. Define attitude. Change of attitude by: Additional information, change in group- affiliation, enforced modification by law and procedures that affect personality (Psychotherapy, counseling and religious conversion).
13. **Defense Mechanisms of the Ego:** Denial, rationalization, projection, reaction formation, identification, repression, emotional insulation, undoing, interjection, acting depersonalization.

Section- II

HEALTH PSYCHOLOGY

1. **Psychological reactions of a patient:** Psychological reactions of a patient during admission and treatment anxiety, shock denial, suspicion, questioning, loneliness, regression, shame, guilt, rejection, fear withdrawal, depression, egocentricity, concern about small matters, narrowed interests, emotional over reactions, perpetual changes, confusion disorientation, hallucination, delusion, illusions anger, hostility, lose of hope.
2. **Reaction to loss:** Reactions to loss, death and bereavement shock and disbelief, development of awareness, restitution, resolution, stages of acceptance as proposed by kulbir – Ross.
3. **Stress:** Physiological and psychological relation to health and sickness: psychosomatic, professional stress burnout.
4. **Communications:**
 - a. Type verbal, non-verbal, element in communication, barriers to good communication, developing effective communication, specific communication techniques.
 - b. Counseling: Definition, Aim differentiates from guidance, principles in counseling and personality qualities of counselors.
5. **Compliance:** Nature, factors, contributing to non – compliance, improving, compliance.
6. **Emotional Needs:** Emotional needs and psychological factors in relation to unconscious patients, handicapped patients, bed – ridden patients, chronic pain, spinal cord, injury, paralysis, cerebral palsy, burns, amputations, disfigurement, head injury, degenerative disorders, parkinsonism. Leprosy, incontinence and mental illness.
7. **Geriatric psychology:** Specific psychological reactions and needs of geriatric patients.
8. **Pediatric psychology:** Specific psychological reactions and needs of pediatric patients.
9. **Behavior Modifications:** Application of various conditioning and learning principles to modify patient behaviors.
10. **Substance abuse:** Psychological aspects of substance abuse: smoking alcoholism and drug addiction.
11. **Personality styles:** Different personality styles of patients.

SECTION-III

CLINICAL PSYCHOLOGY

1. **Introduction:** Definition: sign & synapsing types of mental disorders psychosomatic complications.
2. **Disorders:**
 1. Psychosis: schizophrenia, delusional disorders, acute and transient psychotic Disorders.
 2. Affective disorders: depression disorders, mania, bipolar affective disorders.
 3. Anxiety disorders: agoraphobia, panic disorder, generalized anxiety disorders.
 4. Dissociative disorders, somatoform disorders, OCD.
 5. Organic conditions – dementia, delirium, traumatic.

3. Special therapies:

1. Psychotherapy.
2. Group therapy.
3. Shock therapy.

Books Recommended:

1. Introduction to psychology- Mums- I.D.P. Co.
2. Foundation of psychology- Weld- Publishing house, Bombay.
3. Introduction to social psychology- Akolkar- Oxford publishing house.
4. Psychology and sociology – Applied to Medicine – Porter & Alder – W.B.Saunders.
5. Behavioral Science for Medical - undergraduates –Manju Mehta – Jaypee Brother.

B.P.T. 1st YEAR

PAPER - BASIC PRINCIPLES IN PHYSIOTHERAPY

CODE-B106

THEORY---70

Course objective:-

- i. The students will be able to understand the different types of electric currents.
- ii. The students will be able to understand about the properties of the matter.
- iii. The students will be able to understand about conductors and insulators .
- iv. The student will be able to understand about voltmeters ,transformers and choke coil.
- v. The students will be able to understand about DC and AC circuits.
- vi. The students will be able to understand about forces, gravity, levers, pullies, spring.
- vii. The students will be able to understand about exercise therapy ,it's principles ,techniques and it's application.
- viii. The students will be able to understand about different types of movements, muscle work and neuromuscular coordination.

SECTION – I

A. Physical Principles:

1. Structure and properties of matter- solids, liquids and gases, adhesion, surface tension viscosity, density and elasticity.
2. Structure of atom, molecules, elements and compounds.
3. Electron theory, static and current electricity.
4. Conductors, Insulators, Potential difference, Resistance & Intensity.
5. Ohm's Law- Its application to AC & DC currents.
6. Rectifying devices – Thermionic Valves, Semiconductors, Transistors, Amplifiers, Transducers Oscillator circuits.
7. Capacitance, condensers in DC and AC Circuits.
8. Display devices & indicators- analogue & digital.

B. Effects of Current Electricity

1. Chemical effects – Ions and electrolytes, Ionization, Production of E.M.F. by chemical actions.
2. Magnetic effects, Molecular theory of Magnetism, Magnetic fields, Electromagnetic induction.
3. Millimeter and Voltmeter, Transformers and Choke Coil, thermal effect-joule law, heat production.
4. Physical principles of sound and its properties.
5. Physical principles of light and its properties.
6. Electromagnetic spectrum – biophysical application.

C. Electrical supply:

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

SECTION – II

A. Biomechanical principles

1. Force: Composition of force, parallelogram of forces, Resolution of forces.
2. Equilibrium: Stable, unstable, neutral.
3. Gravity: Center of gravity, Line of gravity, Base of support.
4. Levers: 1st order, 2nd order, 3rd order, their examples in the human body and their practical applications in physiotherapy, forces applied to the body levers.
5. Pulleys: Fixed, Movable.
6. Springs: Series; Parallel.
7. Tension.
8. Elasticity: Hook's law.
9. Axis: Sagittal, frontal, vertical.
10. Planes: Sagittal, frontal, horizontal.
11. Definition of speed, velocity, work, energy, power, acceleration, momentum, friction and inertia.

B. Introduction to exercise therapy, principles, technique and general areas of its application, Assessment & its importance.

C. Introduction to movements including analysis of joint motion, muscle work and Neuro muscular co- ordination.

D. Principles, classification, techniques, physiological & therapeutic effects, indications & contraindications of therapeutic exercises.

E. Describe the classification of movements.

Book Reference:

1. Clayton's electrotherapy theory and practice IX Edition by Angela Forester, Nigel Palastanga.
2. Clayton's electrotherapy theory and practice X Edition by Kitchen & Bazin.
3. Clinical Electrotherapy by Rogar M.Nelson & Dean P. Currier.
4. Electrotherapy explained Principles and practice III Edition by John Low & Ann Reed.
5. Principle and practice of Electrotherapy by Joseph Kahn.
6. Electrotherapy: Clinics in physical therapy- Wolf.
7. Practice exercise therapy- Hollis- Blackwell Scientific Publication
8. Therapeutic Exercises- Basmajian- Williams and Wilkins.
9. Therapeutic Exercises Foundations and Techniques –Kisner and Colby –F.A. Davis.
10. Principle of exercise of therapy – Gardiner –C.B.S. Delhi

B.P.T. 1st YEAR

PAPER – ENGLISH COMMUNICATION

CODE-B107

THEORY-40

Course Objective:-

- i. The students will be able to understand the Communication in depth.
- ii. The students will be able to understand about the languages of communication.
- iii. The students will be able to understand about speaking skills and writing skills.
- iv. The student will be able to understand about reading & understanding.

Introduction:

1.Theory of Communication, Types and modes of Communication

2. Language of Communication:

Verbal and Non-verbal (Spoken and Written) Personal, Social and Business Barriers and Strategies
Intra-personal, Inter-personal and Group communication

3. Speaking Skills:

Monologue
Dialogue
Group Discussion
Effective Communication/ Mis- Communication
Interview
Public Speech

4. Reading and Understanding

Close Reading
Comprehension Summary
Paraphrasing
Analysis and Interpretation
Translation(from Indian language to English and vice-versa)
Literary/Knowledge Texts

5. Writing Skills

Documenting
Report Writing
Making notes
Letter writing

Recommended Readings:

1. *Fluency in English* - Part II, Oxford University Press, 2006.
2. *Business English*, Pearson, 2008.
3. *Language, Literature and Creativity*, Orient Blackswan, 2013.
4. *Language through Literature* (forthcoming) ed. Dr. Gauri Mishra, Dr Ranjana Kaul,
Dr Brati Biswas

B.P.T. 2nd YEAR

PAPER - PATHOLOGY & MICRO-BIOLOGY

CODE-B201

THEORY---70

Course Objective: -

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

- I. Acquire the knowledge of concepts of cell injury and changes produced Thereby in different tissues and organs; Capacity of the body in healing Process.
- II. Recall the Etio-pathological effects and the Clinico-pathological correlation of common infection and non-infectious diseases.
- III. Acquire the knowledge of concepts of Neoplasia with reference to the Etiology gross and microscopic features diagnosis and prognosis in different tissues and organs of the body.
- IV. Correlate normal and altered morphology of different organ systems in different diseases needed for understanding disease process and their clinical significance (with special emphasis on neuro-musculo- skeletal and cardio-respiratory system).
- V. Acquire knowledge of common immunological disorders and their resultant effects on the human body.
- VI. Understand in brief, about the Hematological diseases and their results effects on the human body.

(Part –I): Pathology

COURSE DESCRIPTION

A. General Pathology:

1. Cell injury- causes, mechanisms with special reference to.
2. Physical, Chemical and toxic injury and ionizing radiation.
3. Reversible cell injury (degenerations)-types, morphology-cellular swelling fatty change.
4. Intracellular accumulations –hyaline change and mucinous change.
5. Irreversible cell injury types of necrosis apoptosis Gangrene types and Etiopathogenesis.
6. Pathological calcification-dystrophic and metastatic, pathogenesis and morphology.
7. Extra- cellular accumulation-amyloidosis.
8. Pigments and pigmentations.

B. Inflammation & Repair-

1. Acute inflammations features, causes, vascular & cellular events,
2. Morphologic variations.
3. Inflammatory cell & mediators,
4. Chronic inflammation:-causes, types, non-specific & granulomatous-with examples.
5. Wound healing by primary & secondary intention, factors promoting & delaying healing process, healing at various sites including bones nerve & muscle.
6. Regeneration & repair.

C. Immuno-Pathology (Basic concepts)-

1. Immune system:- organizations cell- Antibodies- Regulations of immune responses,
2. Hyper-sensitivity,
3. Secondary immune deficiency including HIV.

4. Organ transplantation

D. Brief Medical Genetics Deficiency disorders of Vitamin A, B, C and D.

E. Circulatory disturbances-

1. Edema- pathogenesis, types (transudate/ exudate).
2. Chronic venous congestion- lung, liver and spleen.
3. Thrombosis- formations, fate and effects.
4. Embolism- types, clinical effects.
5. Infarction- types, common sites.
6. Shock-Pathogenesis, Types, morphologic changes.

F. Growth Disturbance

1. Atrophy- malformation, agenesis dysplasia.
2. Neoplasia- classification, histogenesis, biologic behavior, difference between benign & malignant tumors.
3. Malignant neoplasm- grades, stages, local invasion & distal spread.
4. Carcinogenesis
5. Precancerous lesions & carcinoma in situ.
6. Tumor & host interactions- systemic effects- metastasis or spread of tumors especially affecting bones spinal cord leading to paraplegia,etc

G. Diseases of Blood.

1. Red cell disorders anemia's polycythemia.
2. Non Neoplastic disorders and neoplastic proliferation of white cell.
3. Bleeding Disorders: - DIC, Thrombocytopenia, coagulation Disorders.

H. Topics in Special Pathology:-

1. **Cardio Vascular system:** - Atherosclerosis, Ischemic heart disease- Myocardial-infarctions-Pathogenesis/ pathology, hypertension, congestive cardiac Failure, Rheumatic heart diseases and Peripheral vascular diseases.
2. **Respiratory System:**-COPD, pneumonia (lobar broncho viral), Tuberculosis: - primary and secondary, morphologic types, pleuritis-Complication (lung collapses & atelectasis).
3. **Neurological system:-** Neuropathology reaction of nervous tissue to injury, infection & Ischemia. Meningitis-Pyogenic, tuberculous and viral, cerebro-vascular diseases atherosclerosis, thrombosis, embolism, aneurysm, hypoxia, infarction & hemorrhage effects of Hypotension on CNS. Coma, polio myelitis, leprosy, demyelinating diseases, parkinsonism. Cerebral palsy, metachromatic leucodystrophy, dementia, Hemiplegia and paraplegia, pathogenesis & pathology of Wilson's disease, space occupying lesions (in brief), peripheral nerve injury.
4. **Muscle diseases-** muscular dystrophy, hypertrophy, pseudo hypertrophy, atrophy, poliomyelitis, myositis ossificans, necrosis, regeneration & myotonia.
5. **Neuro-muscular junction:** - myasthenia gravis, myasthenics syndromes.
6. **Bone & joints-a)** Fracture healing, osteomyelitis, rickets, osteomalacia, bone tumors,

osteoporosis, spondylosis, PID, scoliosis, haemarthrosis, gout, T.B, Arthritis-degenerative, inflammatory- Rheumatoid arthritis, Ankylosing spondylitis, tenosynovitis.

7. **Urinary:** commonly encountered in paralytic bladder, common urinary tract Infections, (brief) –uninary calculi.
 8. **Gastrointestinal system-** (1hr.) Gastric/duodenal ulcer, enteric fever, tuberculous enteritis, gastritis (related to consumption of NSAID).
 9. **Endocrine-** hyperthyroidism, diabetes.
 10. **Hepatic diseases** (1hr.)-cirrhosis and emphasis on systemic effects of portal hypertension.
 11. **Skin-** melanin pigment disorders vitilgo, tinea versicolor, psoriasis, bacterial / fungal infections, cutaneous tuberculosis, scleroderma, SLE leprosy, alopecia.
- I. **Clinical pathology-** (Including demonstrations)-anemias, total leucocyte count, differential leucocyte count, eosinophilia, ESR, CPK, Muscle /skin /nerve biopsy. Microscopic appearance of muscle necrosis-fatty infiltrations. Lab. Investigation in liver & renal failure.

Text books:-

1. Text book of pathology for dental student by Harsh Mohan
2. Basic pathology by Cotran Kumar Robbins

(Part-II) Microbiology

General Bacteriology

| S.No. | Topic of lecture | Contents |
|-------|--|---|
| 1. | Introduction and Historical Background | Louise Pasteur, Robert Koch |
| 2. | Morphology and Physiology of Bacteria | Classification of bacteria and growth curve |
| 3. | Identification of Bacteria | Laminar flow, Gram staining and Z-N staining |
| 4. | Sterilization and Disinfection | Autoclave, Hot air oven, Chemical agents |
| 5. | Waste Disposal | Definition of waste, Classification and disposal. |

SYSTEMATIC BACTERIOLOGY

| Sr. No. | Topic of Lecture | Contents |
|---------|-----------------------|---|
| 1. | Gram Positive Cocci | Staphylococcus/Streptococcus/Pneumococcus -Morphology, pathogenesis, Laboratory diagnosis |
| 2. | Acid Fast Bacilli | <u>Mycobacterium tuberculosis.</u> Classification, Morphology, Growth on L.J.medium, Pathogenesis, Laboratory diagnosis briefly mention National T.B. control programme and mention about Atypical mycobacterium Mycobacterium leprae Morphology, Pathogenesis & Laboratory diagnosis |
| 3. | Cl.welchii, Cl tetani | Classification, Morphology, Pathogenesis, Laboratory diagnosis, Prevention and Control. |
| 4. | Salmonella typhi | Morphology, Pathogenesis, Laboratory diagnosis, Prevention and Control. |

IMMUNOLOGY

| Sr. No. | Topic of Lecture | Contents |
|---------|------------------|---|
| 1. | Introduction | Definition of immunity, types of immunity Active and passive immunity, local immunity and herd immunity. |
| 2. | Antigens | Definition, types, antigen determinants, properties of antigen. |
| 3. | Antibodies | Definition, nature, structure classes Physical and biological properties of immunoglobulin. |
| 4. | Hypersensitivity | Definition, Classification, difference between immediate and delayed reactions, mechanism and manifestation of anaphylaxis, types and tests for anaphylaxis. |
| 5. | Vaccination | National immunization Programme. Nature of vaccines, rationale and dosage |

PARASITOLOGY

| Sr. No. | Topic of Lecture | Contents |
|---------|------------------------------|---|
| 1. | Introduction of Parasitology | Parasites:- their nature, classification, explanation of terminology, emerging parasitic infections. |
| 2. | Plasmodium | Morphology, Life cycle, Pathogenesis, Laboratory Diagnosis |

| | |
|-------------------------|--|
| 3. Taenia solium | Morphology, Life cycle, Pathogenesis (Neurocysticercosis) Laboratory Diagnosis of Neurocysticercosis |
| 4. Wuchereria bancrofti | Morphology, Life cycle, Pathogenesis, Laboratory Diagnosis |

MYCOLOGY

| Sr. No. | Topic of Lecture | Contents |
|----------------|-------------------------|---|
| 1. | General Mycology | Laboratory diagnosis of fungi Morphological and clinical classification of fungi |
| 2. | Mycetoma | Pathogenesis and Laboratory diagnosis |
| 3. | Candida | Pathogenesis and Laboratory diagnosis |
| 4. | Cryptococcus | Pathogenesis and Laboratory diagnosis |
| 5. | Aspergillus | Pathogenesis and Laboratory diagnosis |

VIROLOGY

| Sr. No. | Topic of Lecture | Contents |
|----------------|-------------------------|---|
| 1. | General | Morphology, multiplication, classification of viruses, -Laboratory diagnosis of viral infections |
| 2. | Herpes simplex 1 | Morphology, pathogenesis, Laboratory diagnosis |
| 3. | Hepatitis B Virus | Morphology, pathogenesis, Laboratory diagnosis, Immunoprophylaxis |
| 4. | Hepatitis C Virus | Morphology, pathogenesis, Laboratory diagnosis |
| 5. | Polio Virus | Morphology, pathogenesis, Immunoprophylaxis |
| 6. | Measles | Morphology, pathogenesis, Laboratory diagnosis, Immunoprophylaxis |
| 7. | Mumps | Morphology, pathogenesis, Laboratory diagnosis, Immunoprophylaxis |
| 8. | Rabies | Morphology, pathogenesis, Laboratory diagnosis, Immunoprophylaxis |
| 9. | HIV/AIDS | Morphology, Pathogenesis , Lab diagnosis, Universal precaution, prophylaxis. |

APPLIED MICROBIOLOGY

1. Sinusitis
2. Lower Respiratory tract infection
3. Infection of Central Nervous System.
4. Bone and joint infections.
5. Hospital infections, role of laboratory in cross infection, control policies.

Practical

General Bacteriology:-

Microscopy & Morphology

1. Microscope
2. Staining methods- Gram staining, Z-N staining
3. Scheme for laboratory diagnosis of infective diseases which includes

Collection storage and transport microbiological specimens.

Sterilization - demonstration of details on working and efficacy testing of

1. Autoclave, Hot air oven & inspissator
2. Modes of actions of chemical agents on microbes- phenols halogens aldehydes
3. Acids alcohols heavy metals oxidizing agent.
4. Universal biosafety

Systemic Bacteriology - Identification of bacteria

Virology - Demonstration of morphology of viruses

Mycology - Demonstration of fungus

Parasitology -Peripheral Blood smear

Books recommended:

- | | |
|---|----------------|
| 1. Text book of microbiology for dental student | baveja |
| 2. Text book of medical microbiology | rajesh Bhatia& |
| 3. Textbook of medical microbiology | arora &arora |
| 4. Text book of medical parasitology | arora &arora |

Reference book:

- | | |
|------------------------------|---|
| 1. Text book of microbiology | -R ananthanarayan & c.k jayaram paniker |
|------------------------------|---|

B.P.T. 2nd YEAR

PAPER - PHARMACOLOGY

CODE-B202

THEORY---70

Course Objectives:-

- I. Explain how the fundamental pharmacological properties of pharmacokinetics and pharmacodynamics influence routes of administration; drug distribution and drug levels in the body; drug efficacy and potency; potential for drug-drug interactions; drug toxicity; and the appropriate choice of drug for pharmacotherapy in a given patient.
- II. Explain how to use drug-specific and patient-specific pharmacokinetic parameters to calculate the physiochemical properties that influence rates of drug disposition and clearance in the body, and how these parameters can be used to monitor, design and modify appropriate dosing regimens of drugs in specific patient populations.
- III. List the major drugs and drug classes currently used in medical practice and describe their pharmacology including their indications, contraindications, clinical use, mechanisms of action, physiological effects, pharmacokinetic properties, major adverse effects and clinically significant drug interactions.
- IV. Apply knowledge of the pharmacology of the major drugs and drug classes currently used in medical practice, together with both disease-specific and patientspecific factors to select the most appropriate medication(s) for the effective pharmacotherapy of a given disease or condition in a specific patient.
- V. Demonstrate an understanding of the molecular, cellular and physiological mechanisms underlying the pathophysiological changes that occur in the etiology of the most common disease states and describe how targeting these mechanisms with the appropriate choice of drug(s) can act to effectively treat, cure, or mitigate the underlying disease causes and/or symptoms.
- VI. Discuss the theoretical considerations and principles that underlie the successful pharmacotherapy of the major diseases and conditions.
- VII. Explain the physiological, pharmacological, and psychological effects of acute and chronic exposure of individuals to drugs with abuse potential, and the consequences of sudden withdrawal of such a drug from a drug-dependent individual.

1. GENERAL PHARMACOLOGY:

1. Definition division of pharmacology dosage forms drug nomenclature.
2. Routes of administration adv & disadv. of commonly used routes of administration
3. Factors affecting dose of a drug.
 - 3a. bioavailability and other imp pharmacokinetic parameters.
4. Various mechanism of action of a drug.
5. Adverse drug reaction include drug.

6. Adverse drug reaction including drug allergy idiosyncrasy.
7. Drug interactions synergism antagonism etc.

2. ANS:

1. Sympathomimetic drug therapeutic uses of adrenaline etc.
2. Beta adrenergic blockers alpha adrenergic blockers.
3. Parasympathomimetic drug their therapeutic uses and uses and adverse effects treatment of myasthenia gravis.
4. Atropine, Atropine substitute T/t of organ phosphorus poisoning.

3. PERIPHERAL NERVOUS SYSTEM & AUTOCOCIDS:

1. Skeletal Muscle Relaxants.
2. Centrally acting muscle relaxants.
3. Local anesthetics.
4. Anti histaminic.

4. CNS:

1. Pre Anaesthetic medication & G.A. and stages of anaesthesia.
 1. a Analgesic – Opioids.
2. Analgesics – NASID, s etc.
3. Anti – Parkinson drug & T/t of neurodegenerative disorders.
4. Sedative & hypnotics & T/t of Insomnia.
5. Antiepileptic drug & T/t of epileptics
6. Ethyl alcohol drug of addiction T /t of Methyl alcohol poisoning
7. Drug used in common psychiatric disorders.

5. ENDOCRINES:

1. Anti diabetes drug T/t of DMT/t of Diabetic ketoacidosis.
2. Glucocorticoids
3. Anabolic steroid
4. Ca++ Metabolism T/t of osteoporosis etc.

6. GIT:

1. Laxative & purgative and T/t of constipation.
2. Anti diarrhoeal drugs & T/t of diarrhea.
3. Drug for gastric and peptic ulcer.
4. Anti emetics & misc . Drugs digestants etc.

7. CHEMOTHERAPY:

1. Penicillin's & Sulphonamides.
2. Broad spectrum Antibiotics.
3. Aminoglycosides & T/t of urinary tract infection.
4. Macrolides & Misc. AMA
5. Quinolones
6. Anti TB Drug, HIV, AIDS & Treatment of AIDS
7. Anti leprosy drug T/t of anaerobic infections.
8. Anti cancer drugs.

9. T/t of amoebiasis, helminthic infection.
10. Antifungal drugs.
11. Anti septics & disinfectants.

8. CVS & BLOOD:

1. Anti hypertensive & T/t of hypertension etc.
2. Antianginal drugs & T/t of MI
3. Drugs used in shocks/t of anaphylactic shock Hemorrhagic shocks etc.
4. Iron – deficiency anemia and other anemias.

9. MISC . TOPIC

1. Drug acting on skin e.g. Lotions liniments ointments.
2. Vitamins vit deficiency.
3. Heavy metal antagonists & general principles of T/t of poisoning.
4. Immunostimulants and Immunosuppressant.
5. Antitussives & Bronchial asthma.
6. Drugs banned in sports & Athletes.
7. Vaccines & sera, Immunization schedule

RECOMMENDED BOOKS:

1. Essentials of pharmacology by Surendra Singh
2. pharmacology by Bhattacharya Sen ray choice editor P.K. Das
3. Clinical Pharmacology by Sennet.

B.P.T. 2nd YEAR

PAPER - BIOMECHANICS

CODE-B203

THEORY---70

COURSE DESCRIPTION

This Course Supplements the Knowledge of anatomy and enables the student to have a better understanding of the principles of biomechanics and their application in musculoskeletal and dysfunction.

Course Objectives:-

- i. The objective of this course is that student will be able to demonstrate the basic principles of biomechanics along with their application in the normal as well as in various pathological conditions.
- ii. The students will be armed with a full understanding of this branch of human biomechanics with the ability to suggest novel ways of performing an activity.
- iii. The students will be able to identify the appropriate approach to investigating activities they are interested in.
- iv. To acquire the knowledge of axis and planes.
- v. To review the anatomy of each joint.
- vi. Learn thoroughly about each movement occurring at each joint.
- vii. To acquire the knowledge of forces acting at various joints.
- viii. To acquire the knowledge of muscle and joint work in activities of daily living.

1-BASIC CONCEPTS OF BIOMECHANICS:

- Introduction to Bio-Mechanics and kinesiology, Basic Concept of Kinetics and Kinematics
- Types of motion: Translatory, Rotatory, Angular Motion
- Forces: forces systems, Parellel Force system, Concurrent force system and Linear Force System, Friction Force
- Newton's law of motion, concurrent force systems – composition forces, muscle action line etc.
- Axis & Planes
- Levers, Types of Levers , Mechanical Advantage and Disadvantage
- Pulleys, Anatomic pulleys
- Centre of Gravity, line of gravity, Segmental Centres of Gravity, Stability and equilibrium.

II- JOINT STRUCTURE AND FUNCTION

- Basic principles of Joint design and a human joint.
- Tissues present in human joint including fibrous tissue, bone cartilage and connective tissue.
- Classification of joints.
- Joint function, Kinematics chains and range of motion
- Effect of Disease or injury on Structure and function of Joints.

III- MUSCLE STRUCTURE AND FUNCTION:

- Elements of muscle structure – Composition of a muscle fiber, the motor unit, types of muscle fibers, muscle fiber size, arrangement and number, Muscle tension, length- tension relationship.
- Mechanism of Muscle Contraction.
- Mobility and stability functions of muscle.
- Types of muscle contractions and muscle work.
- Classification of muscles and their functions.
- Factors affecting muscle function: Type of joint and location of muscle attachment, number of joints, passive insufficiency, sensory receptors.

REGIONAL BIOMECHANICS

IV- BIOMECHANICS OF VERTEBRAL COLUMN (SPINE)

- Structure & Biomechanics of Intervertebral Disc
- Muscles and Ligaments of Cervical, Thoracic, Lumbar & Sacral regions.
- Biomechanics of facet joint & Interbody Joint during spinal motions: Flexion, Extension, Side Flexion, Rotation Pathomechanics of spinal motion

V- SHOULDER COMPLEX

- Structural components of the shoulder complex including the articulating surfaces, capsular attachments and ligaments and movements of the following joints:

| | |
|----------------------|-----------------------|
| i) Sternoclavicular | ii) Acromioclavicular |
| iii) Scapulothoracic | iv) Glenohumeral. |
- Dynamic and Static stability of shoulder joint including function of shoulder complex including dynamic stability of the glenohumeral joint musculohumeral Rhythm, Scapulothoracic and glenohumeral contributions.
- Muscles of Shoulder Complex.

VI- ELBOW COMPLEX

- Structure of the Humeroulnar and Humeroradial joints including articulating surfaces, joints capsule, Ligaments & Muscles
- Function of the Humeroulnar and Humeroradial joints including the axis of motion, Range of motion, Muscle action.
- Structure and Function of superior and inferior radioulnar joints
- Mobility and Stability of Elbow Complex

VII- THE WRIST AND HAND COMPLEX.

- Structure and Function of
 - Radiocarpal joint
 - Metacarpal joint.
 - Carpometacarpal,
 - Metacarpophalangeal and
 - Interphalangeal joints
- Describe Prehension, Power, Cylindrical, Spherical & Hook grips.
- Describe Precision handling, Pad to pad, Tip to tip and pad to side prehension and functional position of wrist and hand.
- Stability and Mobility of Wrist and Hand Complex

VIII- THE HIP COMPLEX.

- Structure of Hip Joint including the articulating surfaces on the pelvis & the femur; joint capsule. Ligaments & Muscles of Hip Complex
- Pelvis motion; anterior posterior pelvic tilting. Lumbar pelvic rhythm, lateral pelvic tilting, Pelvic rotation.
- Describe reduction of forces with weight shifting and using a cane and deviations from normal in muscular weakness & bony abnormalities.
- Stability and Mobility Function of Hip Complex

IX- THE KNEE COMPLEX.

- Structure of the Tibiofemoral joint, Articulating surfaces on femur and tibia, the

menisci, joint capsule and bursa, Ligaments and Muscles.

- Anterior- posterior and medio- lateral stability of Knee joint:
- Locking and Unlocking Mechanism of Knee Joint : function of menisci and Muscle function.
- Structure and Function of the patellofemoral joint
- Effects of injury and disease in the Tibiofemoral and patellofemoral joints.
- Stability and Mobility Of Knee Complex .

X- ANKLE- FOOT COMPLEX.

- Structure, Function ligaments, Muscles and function of the following:
 - Ankle joint,
 - Tibiofibular joint
 - Subtalar joint
 - Talocalcaneonavicular joint
 - Transverse tarsal joint
 - Tarsometatarsal joint
 - Metatarsophalangeal joint
 - Interphalangeal joint
- Compound articulations of the ankle subtalar talocalcaneonavicular, transverse tarsal and tarsometatarsal joints
- The articular movements in the weight- bearing and Non Weight Bearing subtalar joint motion
- Supination and Pronation Twist .
- Structure and function of the plantar arches
- Metatarsal Break

XI- POSTURE

- Definition, factors responsible for posture, relationship of gravity on posture.
- Postural imbalance – factors responsible for imbalance in Static and dynamic positions.
- Introduction to ergonomics

XII- GAIT

- Description of Normal gait, determinants of gait, spatio temporal features and analysis.

- Gait deviations – Types, Causative factors and analysis.

XIII- ACTIVITIES OF DAILY LIVING (ADLS)- BADL, IADL.

Books Recommended:

1. Joint Structure and Function – A Comprehensive Analysis - Norkins & Levangie - F.A. Davis.
2. Measurement of Joint Motion – A Guide to Goniometry - Norkins & White - F.A. Davis.
3. Brunnstrom's Clinical Kinesiology - Smith et al - F.A. Davis.
4. Basic Biomechanics explained - Low & Reed - Butterworth Heinmann.
5. Kinesiology: Applied to Pathological Motion - Soderberg Lippincott.

B.P.T. 2nd YEAR

PAPER - EXERCISE THERAPY CODE-B204 THEORY---70

Course Objective:-

- i. The students will be able to understand the Exercise therapy in depth.
- ii. The students will be able to understand about the biomechanical principles, movements and range of motion with goniometry.
- iii. The students will be able to understand the manual muscle testing, special manual therapy techniques and posture
- iv. The student will be able to understand about human gait & its cycles.
- v. The students will be able to understand about the hydrotherapy, relaxation and therapeutic gymnasium.

SECTION –I

1. Review of biomechanical principles.

2. Description of fundamental starting position and derived position including joint positions, muscle work, stability, effects and uses.

3. PELVIC TILT

Describe the following:

- a. Normal pelvic tilt; alteration from normal, Anterior tilt (forward), posterior tilt (backward), Lateral tilt.
- b. Muscles responsible for alteration and pelvic rotation.
- c. Identification of normal pelvic tilt, pelvic rotation and altered tilt and their corrective measures.

4. Classification of movements – Describe the types, technique of application, indication, contraindications, effects and uses of the following.

- | | |
|-----------------------------|----------------------|
| a) Active movement | b) Passive movement. |
| c) Active assisted movement | d) Resisted movement |

SECTION –II

1. Manual Muscle Testing.

- a) Principles and application techniques of Manual muscle testing.
- b) Testing position, procedure and grading of muscles of the upper limb, lower limb and trunk etc.

2. Goniometry and its types.

- a) Principle techniques and application of Goniometry.
- b) Testing position, procedure and measurement of R.O.M. of the joints of upper limbs, lower limbs and trunk.

3. Muscle insufficiency –etiology of muscle insufficiency (strength tone power, endurance & volume), general techniques of strengthening, effects, indication, contraindications & precautions.

4. Neuromuscular in coordination-review normal neuromuscular coordination, etiology of neuromuscular in co-ordination & general therapeutic techniques effects indications, Contraindication & precautions.
5. Functional re-education- general therapeutic techniques to re-educate ADL function.
6. To study the principles, techniques of application indication, Contraindication, precaution, effects and uses of Suspension Therapy

SECTION –III

Special techniques:

1. Introduction to special mobilization & manipulation techniques effects indication & contraindications.
2. Conceptual framework, principle of proprioceptive neuromuscular facilitation (PNF) techniques including indication, therapeutic effects, and precautions.
3. Principles of traction physiological & therapeutic effects, classification, types, indications Contraindications, techniques of application, operational skill & precautions.
4. Review normal breathing mechanism, types, techniques, indication, contraindications Therapeutic effects & precautions of breathing exercise.
5. Group therapy –types, advantages & disadvantages.
6. Exercise for the normal person –importance and effects of exercise to maintain optimal health & its role in the prevention of diseases ,Types, advantages, disadvantages, indications, contraindications & precautions for all age group.
8. Soft Tissue Manipulation –History and various types of STM, Physiological effects, techniques

SECTION –IV

Posture balance gait:

1. Normal posture-overview of the mechanism of normal posture.
2. Abnormal posture –assessment, types, etiology, management including therapeutic Exercise.
3. Static and dynamic balance- assessment & management including therapeutic exercise.
4. Gait-overview of normal gait & its components.
5. Gait deviations-assessment, types, etiology, management including therapeutic exercise.
6. Types of walking aid indications effects & various training techniques.

SECTION – V

Hydrotherapy:

1. Basic principles of fluid mechanic as they relate to hydrotherapy.
2. Physiological & therapeutic effects of hydrotherapy including joint mobility muscle strengthening & wound care etc.
3. Types of hydrotherapy equipment, indications, contraindications, operations skill & patient preparation.

Relaxation & Therapeutic Gymnasium

1. Describe relaxation, muscle fatigue, muscle spasm and tension (mental & physical).
2. Factors contributing to fatigue & tension.
3. Techniques of relaxation (local and general)
4. Effects, uses & clinical application)
5. Indication and contraindication.

Therapeutic Gymnasium

- i) Setup of a gymnasium & its importance.
- ii) Various equipments in the gymnasium.
- iii) Operation skills, effects & uses of each equipment.

Practical:

1. To practice all the soft tissue manipulative technique region wise – upper limb, lower limb, neck, back and face.
2. To practice to measurement of ROM of joints- upper limb, lower limb and trunk.
3. To practice the grading of muscle strength region wise- upper limb, lower limb and trunk
4. To study the position of joints, muscle work and stability of various fundamental and derived positions.
5. To practice the various type of suspension therapy and its application on various parts of body – region wise.
6. To study & practice local and general relaxation techniques.
7. To study & practice the various techniques of progressive strengthening exercise of muscles region wise.
8. To study & practice the use of various ambulation aids in gait training.
9. To assess & evaluate and practice various training techniques.
10. To study practice mat exercise.
11. To assess & evaluate normal & abnormal posture & practice various corrective techniques.
12. To assess & evaluate equilibrium balance & practice various techniques to improve balance.
13. To study the structure & functions of hydrotherapy equipment & their application.
14. To study & practice various traction techniques including manual mechanical & electrical procedures.
15. To study & practice various group exercise therapies.
16. To study, plan & practice exercise programs for normal person of various age group.

Book Recommended:

1. Practice exercise therapy- Hollis- Blackwell Scientific Publication
2. Therapeutic Exercises- Basmajian- Williams and Wilkins.
3. Therapeutic Exercises Foundations and Techniques –Kisner and Colby –F.A. Davis.
4. Proprioceptive Neuromuscular Facilitation –Voss et. al –Williams and Wilkins.
5. Principle of exercise of therapy – Gardiner –C.B.S. Delhi
6. Beard's Massage –Wood- W.B. Saunders.
7. Motor control theory and practical application Shumway –Cook & Wallcott. - Lippincott.
8. Hydrotherapy, principle and practice- Campion – Butterworth Heinmann.
9. Muscle testing and functions – Kendall- Williams & Wiikins.
10. Deniels and Worthingham's- Muscle testing- Hislop & Montgomery –W.B. Saunders.
11. Measurement of joint motion: A guide to Goniometry- Norkins & White- F.A. Davis.

B.P.T. 2nd YEAR

PAPER - ELECTROTHERAPY

CODE-B205

THEORY---70

Course Objectives:-

- i. The student will be able to understand the fundamentals of electrotherapy
- ii. The student will be able to do electro-diagnosis
- iii. The student will be able to select various electro-therapeutic tools and techniques with appropriate skills in management of patients for promotion, prevention and cure of various conditions.
- iv. The student will be able to identify indications & contraindications of various modalities and learn its specificity.

Section –I

1. Laws of electrotherapy
2. Review of neuro muscular physiology including effects of the body.
3. Physiological responses to heat gain or loss on various tissues of the body
4. Therapeutic effects of heat cold and electrical currents.
5. Different types of current.
6. Physical principles of electro – magnetic radiation.
7. Physics of sound including characteristics and propagation.

Section- II

BASIC PHYSICS FOR ACTINOTHERAPY (IRR & UVR)

1. Define heat and temperature (in brief)
2. Physical effects of heat- (in brief)
3. Transmission of heat (in brief)
4. Sources of therapeutic heating and its physiological effects.
5. Radiation energy and its properties.
6. Electromagnetic spectrum-production and its properties.
7. Laws governing radiation.
8. Skin
 - a. Structure
 - b. Depth of penetration
9. Discuss in brief piezo-electric effect.

II Infra red rays-

Wavelength, frequency, types & sources of IRR generation, techniques of irradiation, physiological and therapeutic effects, indications, contraindications, precautions, operational skills of equipments and patient preparation.

III Ultra violet rays (UVR)

- i. Wavelength, frequency, types & sources o IRR generation, techniques of irradiation,

physiological and therapeutic effects, indications, contraindications, precautions, operational skills of equipments and patient preparation.

- ii. Dosimetry of UVR.

IV Superficial heat- Paraffin wax bath, Moist heat, Electrical heating pads and Fluidotherapy

- b. Mechanism of production.
- c. Mode of heat transfer.
- d. Physiological & therapeutic effects.
- e. Indications, contraindications, precautions, operational skills of equipment & patient preparation.

Section –III

A. Low Frequency Currents:

1. Introduction of direct, alternation & modified currents.
2. Production of direct current – Physiological and therapeutic effects of constant current, anode and cathode, Galvanism, Ionization and their application in various conditions.
3. Iontophoresis – principles of clinical application, indication, contraindication, precaution, operational skill of equipment and patient preparation.
4. Modified direct current – various pulses, duration and frequency and their effect on nerve and muscle tissue. Production of interrupted and surged current and their effects.
5. Modified direct current – Physiological and therapeutic effects, principles of clinical application, indications, contra indications, precautions, operational skill of equipment & patient preparation.

B. Transcutaneous Electrical nerve stimulation (TENS):-

- a) Type of low frequency, pulse widths, frequencies & intensities used as TENS application
- b) Theories of pain relief by TENS.
- c) Principle of clinical application effects & uses, indications, contraindications, precautions, operational skills of equipment & patient preparation.

C. Electrical Reactions and Electro – diagnostic tests:

- a) Electrical stimuli and normal behavior of nerve and Muscle tissue.
- b) Type of lesion and development of reaction of degeneration.
- c) Faradic – Intermittent direct current test.
- d) S.D. Curve and its application.
- e) Chronaxie, Rheobase & Pulse ratio.

Section –IV

1. Medium frequency currents (interferential therapy)- conceptual framework of medium Frequency current therapy production, biophysical effects, types, therapeutic effects, Techniques of application, indication, contraindication, precautions, operational skill and patient preparation.
2. High frequency currents (SWD and MWD)-production, biophysical effects, types, Therapeutic effects, techniques of application, indications, contraindications precautions, Operational skills and patient preparation.
3. High frequency sound waves (ultrasound)-production, biophysical effects, types, Therapeutic effects, techniques of application, indication, contraindications, precautions operational skill and patient preparation.

Section—V

1. Therapeutic Light physiotherapy (LASER) Definition, historical background , physical Principles, biophysical effects, types, production, therapeutic effects, techniques of application Indications contraindications precautions operational skill and patient preparation.
2. Therapeutic cold (cryotherapy) – source, biophysical effects, types, therapeutic effects, Indications, contraindications, precaution, application, techniques and patient preparation.
3. Therapeutic mechanical pressure (Intermittent compression therapy)-principles, biophysical Effects, types, therapeutic effects, indications, contraindication, precautions, operational Skill and patient preparation.

Section --VI

1. Electro- diagnosis – Instrumentation, definition & basic techniques of E.M.G. and .NCV
2. Bio- feedback – Instrumentation, principles, therapeutic effects, indications, contraindication Limitations, precautions, operational skill and patient preparations.

Section--VII Traction

- a. Mechanism of action.
- b. Physiological & therapeutic effects.
- c. Indications, contraindications, precautions, operational skills of equipment & patient preparation

Electrotherapy- (Practical)

1. To experience sensory and motor stimulation of nerves and muscles by various types of low frequency current on self.
2. To locate and stimulate different motor points region wise, including the upper & lower limbs.
3. Therapeutic application of different low frequency currents faradic foot bath, faradism under pressure, Ionotophoresis.
4. To study the reactions of degeneration of nerves, to plot strength duration curves.
5. To find chronaxie and Rheobase.
6. To study a hydro collator unit, its operations and therapeutic application of Hot packs region wise.
7. To study the various types of Infrared lamps and their application to body region wise.
8. To study a paraffin wax bath unit, its operation and different methods of application – region wise
9. To study the different types of Ultra violet units, their operation, and assessment of test dose and application of U.V.R. – region wise.
10. To study a TENS Stimulator, its operation and application –region wise.
11. To study a short wave diathermy unit its operation and different methods of application- Region wise.
12. To study a micro wave diathermy unit its operation and different methods of application Region wise.
13. To study an ultrasound unit its operational and different methods of application- region wise.
14. To study laser unit its operation and different methods of application –region wise.
15. To study various forms of therapeutic cold application region wise include ice cold packs Vapors coolant sprays, etc.
16. To study a intermittent therapy unit its operation and different methods of application region wise
17. To study a interferential pneumatic therapy unit its operation and different methods of Application—region wise.

18. To observe various electro- myography (EMG) procedures.
19. To observe various electro – neurography (ENG) Procedures.
20. To study a bio feedback unit its operation and different methods of application-region wise.

Books Recommended:

1. Electrotherapy explained principles & practice low & reed – Butterworth Heinemann.
2. Claytons electrotherapy (10th edition) kitchen & Bazin- W.B.Saunders.
3. Therapeutic heat and cold Lehman William & Wilkins.
4. Principles and practice of electrotherapy Kahn Churchill Livingstone.
5. Electrotherapy: clinics in physical therapy- Wolf Churchill Livingston.

B.P.T. 2nd YEAR

PAPER – ETHICS AND LAW IN PHYSIOTHERAPY

CODE-B206

THEORY---70

Course Objective:-

- I. The students will be able to learn about history of physiotherapy profession .
- II. The students will be able to understand about the ethical principles applied in the health care profession.
- III. The students will be able to understand about the rules of professional conduct.
- IV. The students will be able to learn how to maintain relationship with patients , medical colleagues and other professionals.
- V. The students will be able to understand about confidentiality and responsibility.
- VI. The students will be able to learn about the laws and legal concepts .Ex. – Consumer Protection Act and Protection from malpractice claims.

Section-I

1. History of physiotherapy.
2. Philosophy and Philosophical statements.
3. Major Ethical principles applied to moral issue in health care.
4. Rules of professional conduct.
5. Scope of practice.
6. Relationships with patients.
7. Relationships with medical colleagues
8. Relationships between professional with carrier.
9. Relationships with in the profession.
10. Confidentiality and responsibility.
11. Pervasion of services and advertising.
12. Sale of goods.
13. Personnel and professional standard.
14. Professional standard.
15. Professional and government licensing, Accreditation and Education standards.

Section-II

Laws and legal concepts

- Law
- Legal concepts.
- Protection from Malpractice claims.
- Consumer protection Act.
- Liability and Documentation.

Book References

1. British Journal of Physiotherapy 1994 Issues
2. Medical Ethics- By. CM. Francis.

B.P.T. 2nd YEAR

PAPER – YOGA

CODE-B207

THEORY---70

Course Objective:-

- i. The students will be able to understand the ancient yoga & its asanas.
- ii. The students will be able to understand about the philosophy of yoga.
- iii. The students will be able to understand about yoga mudras.
- iv. The student will be able to understand about relationship of yoga & physiotherapy.

SECTION-I

1. (a) Meaning, Philosophy, aims and objectives of Yoga.
(b) Types of Yoga-Raj Yoga, Mantra Yoga, Bhakti Yoga, Karma Yoga and Laya-Yoga and their approaches leading to their goal.
2. Meaning and Philosophy of Asthanga Yoga: its eight steps-Yama, Niyama, Asana, Pranayama, Pratyahar, Dharna, Dhyana, Samadhi, role and mode of practice of each step in the attainment of goal, their psycho-physiological effects of human organizer.

SECTION-II

3. (a) Hatha-Yoga-meaning, philosophy and its constituents.
(b) Shudhi Kriyas (Purificatory Processes), their role and importance in the scheme of Hatha Yogas.
4. Techniques and therapeutic and general benefits of the following:
 - (i) Neti-Jal and Sutra
 - (ii) Dhauti-Dand and Vastra
 - (iii) Kapalbhathi
 - (iv) Nauli

SECTION-III

5. Asana-their major classification:
 - (i) Meditative
 - (ii) Relaxative and
 - (iii) Cultural Psycho-physiological effects of each category of asanas in general-techniques and benefits of the followings Asanas-Bhujanga, Shalabha, Dhanura, Hal, Matsya, Ushtra, Paschimottan, Vakra, Ardhmatsyendra, Chakra, (Standing), Baka, Mayur, Padma, Sidha, Makar, Shava, Vajra, Supta Vajra and Asona.
6. (a) Bandhas and Mudra-meaning and difference between the two techniques and benefits of the following:
 - (i) Bandha
 - (ii) Udiyana and
 - (ii) Mool Bandhas and
 - (i) Mahamudra
 - (ii) Mahabandh Mudra
 - (iii) Vipritkarani
 - (iv) Yoga Mudras.

SECTION-IV

1. (a) Pranayama-meaning, techniques and benefits of the following pranayamas:
 - (i) Suryabhedhi
 - (ii) Ujjai
 - (iii) Bhastrika
- (b) Education values of yoga.
- (c) Role of yoga in physical education and sports.
- (d) Relevance of yoga in modern life.

- (e) Difference between yoga and non yogic systems of exercise.

YOGA (PRACTICAL)

1. Asanas
 - (a) Meditative-Padma, Sidha, Vajra.
 - (b) Relaxative-Shava and Makar
 - (c) Cultural-Dhujanga, Salabha, Dhanura, Hal, Matseya, Ardha-Matsyendra, Ushtra, Paaschimottan, Vakra, Chakra, Bak, Mayur, Vajra, Supta Vajra, Makar, Shava Padma & Sidha.
2. Mudras-Mahamudra, Mahabandh Mudra, Vipritkarani, Yoga Mudras.
3. Bandhas-Jalandhar, Uddiyan, Mool.
4. Sudhi-Net-Jal and Sutra, Nauli, Dhauti (Dand and Vastra) and Kapalbhati.
5. Pranayama-Suryabhedhi, Ujjai and Bhastrika.

BOOKS FOR REFERENCE

- | | | |
|------------------------|---|---------------------------------------|
| 1. Swami Kavalyanad | : | Asanas, Kaivalyadhama Lonavala. |
| 2. _____do_____ | : | Pranayama " " |
| 3. _____do_____ | : | Yogic Therapy " " |
| 4. Joshi, K.S. | : | Yoga and Personality |
| 5. Ma Yoga Shakti | : | Science of Yoga |
| 6. Swami Satya Parkash | : | Patanjal Raj Yoga |

B.P.T. 3rd YEAR

PAPER - GENERAL MEDICINE & PAEDIATRICS

CODE-B301

THEORY---70

Course Objectives:-

At the end of course student will be able to do:

- I. Acquire a basic knowledge of internal medicine, and a greater knowledge of those areas relevant to patients assigned to the individual student
- II. Demonstrate knowledge of the basic sciences and patho-physiologic principles behind the manifestations of the disease conditions
- III. Obtain an accurate, pertinent history from all appropriate available sources and record it in a complete and concise manner.
- IV. Perform and record a thorough physical examination, and review the physical findings with the faculty.
- V. Develop an appropriate differential diagnosis based on history and physical examination findings, laboratory and diagnostic tests results.
- VI. Develop a prioritized and detailed problem list for each patient Utilize clinical reasoning and form hypotheses to assess the patient's presenting problems based on gathered information.
- VII. Identify normal growth, development and behaviour and their assessment, as well as approaches to abnormalities from infancy through adolescence.
- VIII. Describe health maintenance and preventive care for children, including age-related issues in nutrition, safety, vaccination and risk factor identification and modification.
- IX. Recognize common acute and chronic paediatric conditions, congenital and genetic syndromes, and the importance of age on their manifestations and treatment.
- X. Apply principles of physiology and pharmacology to children from birth through adulthood, especially age-related changes.

COURSE DESCRIPTION

PART-I GEN. MEDICINE

Infection diseases:

- Tuberculosis, tetanus, typhoid fever, bacillary dysentery, amoebiasis, HIV
- Infection & AIDS

Measles:

- Nosocomial infection

Metabolic & deficiency disease

- Diabetes mellitus, obesity, vitamin deficiency disease

Diseases of respiratory system (Anatomy & physiology aspects)

- Asthma, bronchitis, collapse, bronchiectasis, pneumonia, lung abscess, empyema.

- COPD (Chronic bronchitis & emphysema)

CVS:

- Hypertension, Congestive Heart Failure, rheumatic fever, infective endocarditis,
- Pericarditis, valvular heart diseases, mitral stenosis, mitral regurgitation aortic
- Stenosis aortic regurgitation
- Congenital heart disease (ASD, VSD, PDA, Tetralogy of Fallot), Eisenmenger syndrome
- Ischemic heart diseases
- Myocardial infarction
- Deep vein thrombosis & pulmonary embolism.

Hematology:

- Anemia (iron deficiency, anemic megaloblastic anemia, hemolytic anemia , anaplastic anemic)
- Thrombocytopenia (idiopathic thrombocytopenia purura).
- Leukemia (ALL, CML, CLL, AML)
- Hemophilia, Lymphadenopathy, Splenomegaly.

Gastrointestinal system:

- Peptic ulcer, hematemesis dyspepsia, diarrhea, malabsorption syndrome.

Diseases of liver

- Jaundice, viral hepatitis, cirrhosis of liver, ascitis.

Diseases of kidney, Post streptococcal glomerulonephritis, nephritic syndrome, urinary tract infection

- Urinary calculi, chronic renal failure.

Endocrinology

- Hypothyroidism, hyperthyroidism, Addison's diseases, Cushing's syndrome, gigantism.

DERMATOLOGY

1. Structure and function of normal skin, primary and secondary lesion, scales & pediculosis.
2. Fungal infection, dermatophytosis, pityriasis, candidiasis
3. Bacterial infection of the skin, impetigo boil.
4. Viral infections herpes.
5. Eczema, dermatitis, allergies
6. Acne, vitiligo, leukoderma.
7. Psoriasis
8. Leprosy
9. STD & VD- Syphilis, gonorrhea, HIV

GERIATRICS

1. Describe the examination and assessment of geriatrics conditions.
2. Pathological changes and principles of management of following conditions
 - a. Musculoskeletal disorder
 - b. Cardiopulmonary disorder
 - c. Neurological disorder.

- d. Injuries and Accidents specific to the age.
- e. Falls prevention and management.
- f. Depression, Delirium, Dementia.
- g. Diabetes Mellitus.
- h. Geriatric depression scale

PART –II PEDIATRIC

- 1. Introduction to pediatrics.
- 2. Growth and development: laws of growth, factors affecting growth & development delay.
- 3. Developmental mile stone: Motor, adaptive, social mile stones.
- 4. Club foot and flat foot: Clinical profile and treatment.
- 5. Knock knees & bow legs: Etiology, sign, symptom and treatment
- 6. Spina bifida & meningocele: Diagnosis, treatment and complication.
- 7. Scoliosis: Diagnosis & Management
- 8. Congenital Dysplasia Hip: Diagnosis & Management.
- 9. Obstetric palsies: Etiology, management & precautions.
- 10. Cerebral palsy.
- 11. Osteogenesis imperfect: Pathogenesis type and treatment.
- 12. Rickets: Etiology, clinical picture and treatment.
- 13. Scurvy: Etiology, clinical picture and treatment.
- 14. Anemia: Etiology, type and management.
- 15. PEM: Type, classification and nutritional therapy.
- 16. Muscular dystrophy: Presentation and management.
- 17. Genetic Disorders: Diagnosis and treatment.
- 18. Down's syndrome: Clinical profile and management.
- 19. Epilepsy: Types and treatment.
- 20. Tuberculosis: Primary complex diagnosis & treatment.
- 21. Bronchial asthma: Etiology & treatment including acute severe asthma.
- 22. Rheumatic fever: Diagnosis criteria, complication & treatment.
- 23. Rheumatoid arthritis: Types and treatment.
- 24. Pneumonia: Causes, sign symptom & treatment
- 25. Congenital Heart Disease: Diagnosis and treatment.

Book Reference:

- 1. Davidson principle and practice of medicine
- 2. Brain clinical neurology
- 3. Medicine & neurology by Golewala
- 4. Surgery by Nan.
- 5. Baily & love short practice of surgery.
- 6. Nelson text book of pediatrics- Behraman & Varghan.

B.P.T. 3rd YEAR

PAPER - GEN. SURGERY AND OBS. & GYNAE

CODE-B302

THEORY---70

Course objective:-

- i. The student will be able to gain knowledge and understanding of common surgical problems.
- ii. The students will be able Understand the indications for, and the limitations of, essential diagnostic studies used to evaluate patients with surgical problems.
- iii. The students will be able to develop an understanding of surgical treatments, and alternatives to surgical treatment.
- iv. The students will become familiar with various surgical procedures and know their expected outcomes and complications.
- v. The students will be familiar with action, dosage and use of common pharmacologic agents used in surgery (antibiotics, analgesics, anticoagulants, sedatives).
- vi. The students will be able to understand about the different types of incisions and their complications.

Section-I

1. General principles of surgery including different incisions.
2. Different types of anesthesia, principles of procedures, complications and management.

3. WOUND HEALING

- a. Healing by primary and secondary intention.
- b. Factors influencing wound healing
- c. Pathogenesis of healing
- d. Scars
 - i) Hypertrophic scar
 - ii) Keloid
 - iii) Types of wounds

4. RESUSCITATION & SUPPORT

- a. Shock-types, clinical features, pathogenesis treatment.
- b. Hemorrhage- types, clinical features & management.
- c. Fluid & electrolyte balances.
- d. Blood transfusion - Indications & management.

5. ARTERIAL AND VENOUS DISORDERS

- a. Varicose veins
- b. Deep vein thrombosis.
- c. Arteriosclerosis and atherosclerosis.
- d. Aneurysm, Buerger's disease, Raynaud's disease.
- e. Thrombophlebitis, pulmonary embolism.

6. LYMPHATICS & LYMPH NODES

- e. Lymphomas
- f. Filariasis
- g. Lymphangitis
- h. Lymphoedema

7. CARDIAC SURGERY

Type of incision, pre and post operative Assessment, management and complications of Cardiothoracic Surgery and their management.

Outline indications, Contra-indication, site of incision, pre and post operative management and complications of the following.

- i. Valvotomy and Valve Replacement.
- j. Open Heart Surgery/ Cardiac Bypass Surgery.
- k. Surgery on Pericardium.
- l. Operations in congenital disorders.
- m. Heart transplantation.
- n. Pacemaker
- o. Coronary Angioplasty.
- p. Balloon Angioplasty and Vascular Surgery.
(Outline surgery of Artery and veins)

8. THORACIC SURGERY

- a. Outline clinical features and management of the following: fracture of ribs, Flail chest, stove in chest, Pneumothorax, Lung Contusion and Laceration and injury to Vessels and Bronchus.
- b. Outline indication, Contraindication, site of incision pre and post operative management and complication of Lobectomy, Pneumonectomy, Segmentectomy, Pleuro pneumonectomy, thoracoplasty, Decortication, Tracheostomy.
- c. Outline clinical features and management of carcinoma of lung.
- d. Management of Endotracheal tube, Tracheal suction, weaning the patient from ventilator, Extubation and Post-extubation care.

9. ABDOMINAL SURGERY

- a. Describe abdominal surgical incisions.
- b. Outline about definition, indications with features, anesthesia, incisions, drains and complications about various surgeries like Nephrectomy, Appendicectomy, Herniorrhaphy, Mastectomy, thyroidectomy, colostomy, Adrenalectomy, Cystectomy, Hysterectomy, Prostatectomy, Cholecystectomy, Ileostomy, Surgical procedures in various types of Hernias.
- c. Anal fissure, fistula, hemorrhoids, rectal prolapse

d. Cholelithiasis, Cholecystitis, Neoplasms

10. NEURO SURGERY

- a. Outline about definitions, indications with features, anesthesia, incisions, drains & complications about various surgeries of
 1. Surgeries of cranium & brain
 2. Surgeries of vertebral column & spinal cord.
 3. Surgeries of peripheral nerves.
- b. Surgical interventions in traumatic head injuries.

11. BURNS & PLASTIC SURGERY

- a. Classify burns by depth and surface area; outline the causes, medical management and precautions in the acute stage.
- b. List the potential deformities due to burns, methods of prevention and precautions, Mentions cosmetics and functional treatment measures.
- c. Outline the plastic surgery procedures and management in burns, including common deformities and prevention of burns contractures.
- d. Skin grafting & other procedures.

12. TRAUMA OF CARVICAL & LUMBER DISC LESION

- i) First Aid management of severely injured patients.
- ii) Tendon & nerve injuries with surgical repair.
- iii) Entrapment neuropathy with surgical intervention
- iv) Diagnosis & management of Hand injures and infections
- v) Missile injuries mechanism & management
- vi) Blast injures -- Mechanism & Management
- vii) Spinal cord injuries tumors of spinal cord.

13. TUMER, CYSTS, VICERS & SINUSES

- a. Introduction types and clinical features of Tumors
- b. Benign
- c. Malignant
 - Carcinoma
 - Sarcoma
 - Like malignant melanoma etc.
- d. Surgical procedure involved in management of cancer.

Section-II
OBS & GYANE

Course Objective:-

- I.** The students will be able to analyze the impact of genetics, medical conditions, and environmental factors on maternal health and fetal development.
- II.** The students will be able to distinguish between normal and abnormal physiologic changes during pregnancy.
- III.** The students will be able to apply knowledge of intrapartum and postpartum care in simulations

and clinical encounters with mothers and newborns.

IV. The students will be able to differentiate between normal and abnormal bleeding using knowledge of menstrual cycle physiology, puberty and menopause.

V. The students will be able to outline the etiology and evaluation of infertility.

VI. The students will be able to relate knowledge of contraception, sterilization and abortion in shared decision making with patients in clinical scenarios.

| SR. NO. | TOPIC | DETAIL OF SYLLABUS | LECTURE |
|----------------|---|--|----------------|
| 1. | Anatomy of female reproductive system | i) External genital ii) Ovaries fallopian tubes uterus vagina iii) Blood and Nerve supply to genital organs. | 2 |
| 2. | Physiology of pregnancy | i) Menstruation ii) Pregnancy and fetal development iii) Physiological changes in various maternal system and organs. iv) Endocrine system in pregnancy. | 3 |
| 3. | Complication of pregnancy | i) Abortion, Ectopic ii) APH & PPH iii) PIH iv) Abnormal presentation | 2 |
| 4. | Antenatal and postnatal cases | i) Normal Pregnancy- Symptoms signs, investigation, immunization, nutrition and supplements. ii) Normal Delivery iii) Normal Puerperium iv) Role of physiotherapy in pregnancy, delivery, puerperium. | 4 |
| 5. | Common Gynecological problems and role of physiotherapy | i) Disorders of menstruation, menorrhoea, DUB, menopause, menarche ii) Pelvic inflammatory disease iii) Fibroid uterus iv) Stress incontinence | 3 |
| 6. | Common Obstetrics and Gynecological operation | i) Caesarean ii) Hysterectomy iii) D & C iv) MTP v) Tubectomy vi) D&E | 3 |
| 7. | Role of physiotherapy in Obstetrics and Gynecological post operative cases. | Post operative Breathing exercise Mobility | 3 |

Section -III

ENT

Course Objective:-

- i) The student will be able to distinguish between conductive hearing loss and sensorineural hearing loss findings both on tuning fork exam and on an audiogram.
- ii) The student will be able to define acute versus chronic rhinosinusitis and explain the three most common causative organisms and standard treatment for acute rhinosinusitis.
- iii) The students will be able to define the otosclerosis & its management.
- iv) The student will be able to explain the typical progression of acute otitis media at the anatomic level, the three most common causative organisms of otitis media, standard medical and surgical treatments for otitis media, and possible complications of acute otitis media.

1. Rhinitis:

Acute rhinitis
Chronic rhinitis
Chronic non-specific & specific rhinitis
Atrophic rhinitis
Vasomotor rhinitis.

2. Sinusitis

Acute rhino sinusitis
Chronic sinusitis
Surgical treatment of sinusitis.

3. Otitis Media

Acute otitis media (Stages and treatment), chronic otitis media (safe & unsafe type)
Complications of otitis media.

4. Otosclerosis

- a. Incidence
- b. Clinical features
- c. Medical and surgical treatment.

5. Mastoidectomy

Types of mastoidectomy, surgical procedure, complications, Tympanoplasty.

6. Loss of hearing

Types of hearing loss, Methods to detect hearing loss. Presbycusis, hearing aids, hearing loss in children.

7. Audiometry

Section -IV

Opthalmology

Eye- Anatomy and physiology

- a) Common inflammations and other infections of the eye.
- b) Ptosis, defects of the rectus.
- c) Cataract.
- d) Refractions- Myopia, hyper-metropia.
- e) Pleoptic Exercises.

- f) Physiological defects of vision.
- g) Cornea ulcers.

BOOK REFERENCE:-

1. Bailey & Love Shorts
2. Surgery by Nan
3. General surgery operations by R.M Kirk & R.C.N. Williston.
4. Modern trend of ophthalmology- Arnold Sorsby.
5. ENT of general Practitioners.

B.P.T. 3rd YEAR

PAPER - CLINICAL ORTHOPEDICS

CODE-B303

THEORY---70

Course Objective:-

- i) The students will be able to understand the Orthopedics in depth.
- ii) The students will be able to understand about the traumatic conditions, inflammation of bones & joints.
- iii) The students will be able to understand about deformities and disorders related to orthopedics.
- iv) The student will be able to understand about the metabolic bone disorders.
- v) The students will be able to understand about the orthopedic surgical procedures.
- vi) The students will be able to understand about the physiotherapy managements of orthopedic problems.

Section -I

A. TRAUMATIC CONDITIONS

1. Fractures-Types, healing, complications & general principles of treatment.
2. Fractures of Spine, pelvis, femur, patella, tibia, Fibula, ankle, calcaneum, metatarsal, phalanges.
3. Fracture separation of epiphysis.
4. Ligament injuries.
5. Injuries of muscles and tendons.
6. Dislocations elbow, shoulder, hip & ankle.
7. Traumatic paraplegia.

B. INFLAMMATION OF BONES

Tuberculosis & pyogenic osteomyelitis- etiology, clinical features, pathology & Management- operative and non-operative.

C. INFLAMMATION OF JOINTS

Rheumatoid arthritis

Tuberculosis arthritis

Pyogenic arthritis

Etiology, pathology, clinical features and management-operative and non- operative.

D. ANKYLOSING SPONDYLITIS

Gouty Arthritis

Hemophilic joints

Neuropathy joints

Etiology pathology clinical features management

E. SOFT TISSUE INJURIES

Tendon sheath and bursa inflammation and injuries of ankle, wrist, knee, elbow, shoulder, hip and hand. (Causes, Symptoms, management of injuries- tenosynovitis, Bursitis etc.)

F. SPINE

Etiology, pathology, clinical feature and management of Torticollis, cervical rib, spina bifida,

spondylolisthesis, scoliosis, kyphosis, Lordosis, spondylosis (cervical spine and lumbar spine) prolapsed disc.

Section –II

A. Metabolic Diseases of Bone

Etiology, Pathology, Clinical features, Management of Rickets, Osteomalacia, Osteoporosis.

B. Bone Tumors

Classification, Pathology, Clinical Features, Management including chemotherapy and radiotherapy of Benign & Malignant Tumors.

C. Congenital Dislocation

Etiology, Pathology, Clinical Features, Management of Hip, Perthe's Disease, AVN of Hip, Coxa Vara, Coxa Valga, Paralytic Dislocations,

D. Knee

Dislocation, Cartilage lesions, Osteoarthritis and loose bodies, Dislocation of patella, Chondromalacia patella, Genu Valgum, Genu Varum, Genu Recurvatum ,Osgood schlatter's disease.

E. Degenerative Disease

Hip, Knee, Ankle, Spine, Shoulder, Elbow, Wrist, Hand.

F. Poliomyelitis.

G. Cerebral Palsy.

H. Peripheral Nerve Injuries.

I. Amputations

Foot above knee, below knee, hip and pelvis, above elbow, below elbow.

J. Foot and Ankle.

CTEV, Pescavus, Pesvalgus, Hallux Valgus, Foot strains, Metatarsalgia, Hallux Rigidus.

K. Shoulder

Painful arc syndrome, peri arthritis, recurrent dislocation, Biceps-tendinitis, frozen shoulder.

L. Elbow, Wrist, Hand

Osteoarthritis, tennis elbow, Golfer's elbow, Cubitus varus and valgus, Myositis ossificans, Tardy Ulnar neuritis, Madelung deformity, Carpal Tunnel Syndrome, Dupuytren's contracture, Mallet finger, De-quervains disease.

M. Operations

Operative Management of fractures and joints.

Arthroplasty, Arthrodesis.

Bone grafting, osteotomy, tendon transfers.

Book reference:-

1. Orthopedics & traumatology – Natarajan.
2. Applied orthopedics-Broddsmann.
3. Clinical Orthopedics- J Maheshwari.
4. Outline of fracture -- Adams.
5. Outline of orthopedics – Adams.

B.P.T. 3rd YEAR

PAPER - CLINICAL NEUROLOGY

CODE-B304

THEORY---70

Course Objective:-

- i) The students will be able to understand the Neurology in depth.
- ii) The students will be able to understand about the neuroanatomy and neurophysiology.
- iii) The students will be able to understand about deformities and disorders related to neurology.
- iv) The student will be able to understand about the neurological disorders.
- v) The students will be able to understand about the various surgical procedures and assessments of neural components.
- vi) The students will be able to understand about the physiotherapy managements of neurological problems.

COURSE DESCRIPTION

Following the basic science and clinical science course, this course introduces the student to the neurological conditions which commonly cause disability. Particular effort is made in this course to avoid burdening the student with any detail pertaining to diagnosis which will not contribute to their understanding of the limitations imposed by neurological pathology on the functioning of the individual

1. NEUROANATOMY.

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

2. NEUROPHYSIOLOGY

Review in brief the Neurophysiologic basic of disorder of tone posture, bladder control, muscle contraction, movement and pain.

3. CLINICAL FEATURE & MANAGEMENT.

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

1. Congenital childhood disorders.
 - a. Cerebral palsy
 - b. Hydrocephalus
 - c. Spina Bifida
2. Cerebrovascular accident.
 - a. General classification: thrombotic, embolic. Haemorrhagic, ischaemic stroke.
 - b. Gross localization and sequelae.
 - c. Detailed rehabilitative program.
3. Trauma-broad localization, first aid and management of sequelae of head injury and spinal cord injury.
4. Diseases of the spinal cord.
 - a. Craniocerebral junction anomalies.
 - b. Syringomyelia.

- c. Cervical and lumbar disc lesions.
- d. Tumors.
- e. Spinal archnoiditis.
- 5. Demyelinating diseases (central and peripheral)
 - a. Guillian- Barre syndrome.
 - b. Acute disseminated encephalomyelitis.
 - c. Transverse myelitis.
 - d. Multiple sclerosis
- 6. Degenerative disorders.
 - a. Parkinson's disease.
 - b. Dementia.
- 7. Infections.
 - a. Pyogenic Meningitis sequelae.
 - b. Tuberculous infection of central nervous system.
 - c. Poliomyelitis.
- 8. Diseases of the muscle: classification, signs, symptoms, progression and management.
- 9. Peripheral nerve disorders.
 - a. Peripheral nerve injuries: localization and management.
 - b. Entrapment neuropathies.
 - c. Peripheral neuropathies.
- 10. Miscellaneous.
 - a. Epilepsy: Definition, classification and management.
 - b. Myasthenia Gravis: Definition, course and management.
 - c. Intracranial tumors: Broad classification, signs and symptoms.
 - d. Motor neuron disease.

4. ASSESSMENT

Clinical assessment of neurological function to be taught through bedside or demonstration clinics spread out over at least 5 sessions.

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

Book reference:-

- 1. Textbook of clinical neurology – Elsevier.
- 2. Rehabilitative Physiotherapy- O. Sullivan.
- 3. Snell's clinical neuroanatomy- Rian Splittgrber.
- 4. Neurology & neurosurgery illustrated—Lindsay.
- 5. Clinical Neurophysiology – UK Mishra, J. Kalta.
- 6. Neurological differential diagnosis- John & Baron Patten.

B.P.T. 3rd YEAR

PAPER - Research Methodology and Biostatistics

CODE-B305

THEORY---70

Course Objectives:-

At the end of the course the students will be able to: -

- I. Gain knowledge of the basic concepts of Biostatistics & its need for physiotherapy professional practice & research.
- II. To describe an Over – view of research design & methodology of an Experiment or Survey, Demography & vital statistics, Sampling & interpretation of Data
- III. To grow their areas of expertise, increase their use of evidence-based practices, and engage in research.
- IV. Acquire skills of reviewing literature, formulating a hypothesis, collect data, writing research proposal etc.
- V. Describe the importance & use of biostatistics for research work.

COURSE DESCRIPTION

Section-I

- a. Introduction importance of research in Clinical practice scientific approach, characteristics, purpose and limitations.
- b. Ethical issues in research, elements of informed consent.
- c. Structure of a research proposal and research report.
- d. Consent form- steps of documentation and structure.

Section-II

- a. Research question including literature review.
- b. Measurement: Principles of measurement, reliability and validity.
- c. Overview of study design.
- d. Various sampling methods.
- e. Drawing tables, master charts and graphs.

Section-III

Biostatistics:

- a. Basic probability distribution and sampling distribution.
- b. Descriptive statistics.
- c. Standard errors and confidence interval, skewness, & kurtosis.
- d. Comparison of means, T-tests.
- e. Analysis of variance.
- f. Multiple comparisons.
- g. Non-parametric statistics.
- f. Correlations.

g. Test of significance.

Books Recommended:

1. Methods in Biostatistics- Mahajan- J.P.
2. Statistics in Medicine-Colton-Little Brown, Boston.
3. Research for Physiotherapist: Project Design and Analysis-Hicks – Churchill Livingstone
4. Biostatistics: The manual for Statistical methods for in health and nutrition-K.V.Rao. J.P.
5. Research methods in behavioral Sciences- Mohsin- Orient Publication.

B.P.T. 3rd YEAR

PAPER - COMMUNITY MEDICINE

CODE-B306

THEORY---70

. Course Objectives:-

- I. The student will be informed about the concept of disease.
- II. The student will be informed about the role of central and state government public health administrative system, their schemes programmes and role of PHC, SHC and THC.
- III. The student will be informed of the objective and strategies of National family welfare program; Employee state Insurance scheme , PWD act and Workman compensation act.
- IV. The student will be able to differentiate between impairment, disability and handicap.
- V. The student will be informed about the role of and difference between Community and Institute based rehabilitation.
- VI. The student will be informed about the various community diseases.
- VII. The student will be informed about the various nutritional factors on disability

COURSE DESCRIPTION

1. Natural history of disease and the influence of social economic and cultural aspect.
2. Describe the various measures of prevention and levels of intervention for person with disability.
3. Public health administrative system at central and state government.
4. Describe the selective national health schemes and programs.
5. Objectives and strategies of national family welfare program.
6. Describe various Employees state insurance schemes.
7. Describe Community based and Institution based rehabilitation, Advantages and disadvantages.
8. Describe occupational health and various hazards, and prevention.
9. Workman's Compensation act.
10. Describe the following community diseases- Poliomyelitis, Meningitis, encephalitis, tuberculosis, filariasis, leprosy, tetanus, Measles.
11. Describe the Influence of nutritional factors on disability and various nutritional deficiency disorders.

Book Reference:

1. Textbook of preventive and social medicine; Dr. J E Park

B.P.T. 4th YEAR

PAPER - PHYSIOTHERAPY IN ORTHOPAEDIC CONDITIONS

CODE-B401

THEORY---70

Course Objectives:-

- i. Be able to plan & Prescribe as well as acquire the skill of executing short- & long-term Physiotherapy treatment.
- ii. Be able to plan & Prescribe physiotherapeutic treatment by selecting appropriate modes of Mobilization / Manipulations, Electro-Therapy, Therapeutic exercise & appropriate Ergonomic advice.
- iii. Be able to plan & Prescribe therapeutic treatment for relief pain, restoration / Maintenance of function & rehabilitation for maximum functional independence in A.D.L. at home & work place

COURSE DESCRIPTION

Section- I

1. Introduction to Brief review of the following surgical condition and various physiotherapeutic modalities, aims, means and technique of physiotherapy should be taught.
2. Traumatology-General Physiotherapeutic approach for the traumatic conditions.
3. Fracture and dislocations: Classification and type of displacement, method of immobilization, healing of fractures and factors affecting union, non union, delayed union etc. common sites of fractures.
4. Specific fractures and their complete physiotherapeutic management.
5. Upper limb: Clavicle, humerus, ulna, radius, crush injuries of hand.
6. Lower Limb: fracture neck of femur, shaft of femur, patella, tibia fibula, pott's fracture, fracture of tarsal and metatarsals.
7. Spine: fracture and dislocations of cervical thoracic and lumbar vertebrae with and without neurological deficits.
8. Surgical procedures: Pre and post operative management of common corrective procedure like arthroplasty, arthrodesis, osteotomy, tendon transplants, soft tissue release grafting, including polio residual paralysis and leprosy deformities corrections.
9. Injuries: Soft tissue injuries, synovitis, capsulitis volkman's ischemic contracture etc. tear of semilunar cartilage and cruciate ligaments of knee, menisectomy, patellectomy, internal derangement of knee.
10. Amputation: Level of amputation of upper limb and lower limb, stump care, stump bandaging pre and post prosthetic management including check out of prosthesis, training etc.

11. Deformities: Congenital torticollis and cervical rib, CTEV, Pes cavus, pes planus and other common deformities.
12. Acquired- Scoliosis, kyphosis, lordosis, coax vara, genu valgum, genu varum and recurvatum.
13. Degenerative and infective conditions: osteoarthritis of major joints, spondylosis, spondylitis, spondylolisthesis, PIVD, Periarthritis of shoulder, Tuberculosis of spine, bone and major joint, perthes disease, Rheumatoid arthritis, Ankylosing spondylitis etc. and other miscellaneous orthopaedic conditions treated by physiotherapy.
14. Principle of sports physiotherapy – causes of sports injury, prevention of sports injuries, management of acute sports injury, common occurred injuries. Role of physiotherapist in sports principle and advanced rehabilitation of the injured athlete.

Section- II

Physiotherapeutic Management of Orthopedics conditions

Physiotherapeutic management of all the above mentioned minor and major orthopedics conditions.

Practical

Various physiotherapy modalities and treatment techniques for the above mentioned conditions to be demonstrated and practiced by the students in clinical setup.

Books Recommended:

1. Cash textbook of orthopaedics and Rheumatology for physiotherapists – Downie –Jaypee brothers.
2. Tidy's physiotherapy- Tomson et. al Butterworth Heinmann
3. Essentials of orthopaedics and applied physiotherapy – Joshi and Kotwal- B.L. Churchill Livingstone.
4. Tetraplegia & Paraplegia- Bromley- W.B. Saunders.
5. Orthopaedics physiotherapy- Donatelli & Wooden- WB. Saunders.
6. Rheumatological Physiotherapy- David – Mosby
7. Orthopaedic Physiotherapy- Tidys and well – Mosby
8. Physiotherapy for amputee- Engstrom & Van de van – Churchill Livingstone
9. Sports Injuris: Diagnosis and management: Norris Butterworth Heinmann.

B.P.T. 4th YEAR

PAPER - PHYSIOTHERAPY IN NEUROLOGICAL CONDITIONS

CODE-B402

THEORY---70

Course Objectives:-

Upon successful completion of this course students will be able to:

- a. Demonstrate professional behavior and respectful communication with participants in all educational activities
- b. Self-assess knowledge, skills, behaviors and attitudes during learning sessions;
- c. Demonstrate professional and academic integrity;
- d. Demonstrate team work for group activities;
- e. Incorporate Patient Safety Competencies in all relevant learning activities.
- f. Understand the typical progressions of motor milestones in infancy and childhood.
- g. Perform a basic neurological assessment to provide the relevant information for effective treatment planning for clients across the lifespan
- h. Apply knowledge from co-requisite courses to the interpretation of clinical findings and formulation of a basic physical therapy management plan.
- i. Formulate a safe and effective treatment plan, including principles of disease and injury prevention, with short and long-term goals that consider the patient as a whole within a specific environment, cultural background for clients with neurological conditions.
- j. Apply principles of motor control and motor learning to formulate and implement a safe and effective treatment plan with short and long-term goals.
- k. Use available evidence to provide education and feedback to standardized clients, model patients and peers.

SECTION-I

Physiotherapy in Neurological conditions

COURSE DESCRIPTION:-

This course serves to integrate the knowledge gained by the students in Clinical Neurology, with the skills gained in exercise therapy, electrotherapy and massage, thus enabling them to apply these in clinical situations of dysfunction due to pathology in the nervous system.

COURSE OUTLINE

A. REVIEW OF NEUROANATOMY AND PHYSIOLOGY.

Review the structure and function of a) neuron b) synapse c) supporting tissue, Review the organization and function of a) cerebral hemispheres b) cerebellum c) spinal cord d) peripheral nerves e) pyramidal system f) extra pyramidal system. Review the factors influencing alpha motor neuron activity. Review the neurological basis of muscle tone and movement and demonstrate the following: a) hypertonia b) – spasticity and rigidity c) ataxia d) athetosis e) chorea).

B. PRINCIPLES OF ASSESSMENT :

Review a) skill in history taking b) assessment of higher functions, cortical sensations, cranial nerves, dorsal column sensation and pain & temperature sensations c) assessment of motor function : grading of muscle power, assessment of range of movement, balance and coordination d) assessment of superficial and deep reflexes e) assessment of reflex maturation in terms of stimulus, position negative/positive reaction and their significance f) assessment of gait- both normal and abnormal (spastic, ataxic and paralytic patterns) Emphasis should be placed on teaching accurate assessment techniques and various recording methods e.g. color coding on body charts, graphs etc

C. PRINCIPLES OF TREATMENT :

Review the treatment principles as follows:-

- a. Sensory re –education: hypersensitivity, hyposensitivity and anesthesia.
- b. Treatment of altered tone: hyper tonicity and hypo tonicity.
- c. Motor re-education: Strengthening exercise, coordination exercise, joint mobilization exercise, use of equilibrium and labyrinthine systems, use of PNF patterns, controlled sensory stimulation to bias the spindle cells e.g. Vibration, tactile, ice etc. use of stretch to elicit movement (facilitation), light joint compression (inhibition), activity to improve motor function, phylogenic sequence of motor behavior.
- d. Treatment to improve function: Free exercise, gait training with and without aids, activities of daily living, mat exercise, exercise for recreation.
- e. Review the use of ambulatory aids in neurological conditions: In spastic upper motor neuron lesions, lower motor lesions, in dorsal column dysfunction and cerebral dysfunction.
- f. Review the use of splints and braces in spastic upper motor neuron and in flaccid lower motor neuron lesions, in both upper and lower limbs.
- g. Review the management of chronic pain in neurological conditions with respect to type of pain, treatment modalities available, selection criteria for each modality and possible complications.

D. CEREBRAL PALSY:

- Define cerebral palsy and describe the topographical classification- monoplegia, diplegia, paraplegia, hemiplegia & tetraplegia.
- Describe types of cerebral palsy.
- Assess reflex activity at different levels: Cortical, mid brain, brain stem, spinal.
- Assess developmental milestones from birth to five years.
- Assess functional ability: Prone to supine (rolling) Coming to sitting, quadruped, crawling, kneeling, kneel-stand, stand with support and walking.
- Examine for contractures as follows: hip flexion, adduction, internal rotation, Knee flexion, ankle plantar flexion, inversion/ eversion. Flexion contracture of elbow, wrist & fingers and spinal deformities.
- Treatment – Describe and demonstrate the treatment motor dysfunction: Passive movement,

stretching of soft tissue tightness, use of ice to reduce spasticity, positioning the child to prevent soft tissue contractures, to inhibit abnormal reflexes and to facilitate volitional movement.

- Describe and demonstrate techniques of carrying of different type of CP children, encouraging bimanual activities in different starting positions like prone sitting and standing and activities across the midline.
- Describe appropriate home programs for positioning the child, handling them and assisting improvement of function. Introduction to treatment techniques: Bobath, Rood.

E. PERIPHERAL NERVE LESIONS:

- Identify type of peripheral nerve lesions.
- Assess the motor system: Specific muscles, Range of motion, active and passive ranges, muscle girth.
- Assess sensory system: touch, pain, temperature, paraesthesia, nerve reverberation.
- Assess autonomic function: sweating, skin condition, soft tissue atrophy.
- Treatment: describe muscle reeducation techniques: electrical stimulation (selection of current): active, assisted, resisted movements, Passive and self assistive stretching and massage.
- Describe sensory re-education and pain relief by various modalities, describe the common splints used peripheral nerve lesions. Static, dynamic and functional. Isolating muscle contraction, specific muscle strengthening.
- Post- Operative management: Pressure bandaging & muscle re-education after transfer. Describe a home program.

F. MUSCULAR DYSTROPHY.

- Describe stages of the disease: ambulatory, wheelchair and bed stages.
- Describe significance of exercise resisted, active and free. Identify and assess common contractures and deformities. Assess range of motion and muscle power.
- Assess functional ability.
- Demonstrate treatment program for strengthening weak muscles: active movements and hydrotherapy.
- Increase range of motion by suspension therapy, powder board, passive stretching positioning etc. demonstrate gait training with appropriate orthoses.
- Describe management of chest complication: breathing exercises chest percussion, drainage of secretions and assisted coughing.

G. PARKINSONISM:

- Review the natural history, course and prognosis of the disease.
- Identify and assess problems in posture sitting, kneeling and standing balance, voluntary and automatic movements, rigidly, Tremor and gait. Assess also hearing, speech and finger dexterity.
- Describe disability grading.
- Demonstrate treatment: postural awareness and relaxation training. Gait training techniques: associated reactions, heel-toe gait, overcoming obstacles, start and stop on command, turning and walking backwards, forwards and sideward.
- Describe an appropriate home exercise program.

H. SPINAL CORD LESIONS:

- Describe types of spinal cord lesions.

- Describe sign of tract and root interruptions,
- Describe positioning of the patient in acute spinal cord injury,
- Describe assessment of the motor system: tone, power of specific muscle range of motion and limbs girth. Describe assessment of sensory system and reflexes.
- Describe assessment of functional ability and balance reactions in appropriate cases. Describe assessment of respiratory function. Muscles of respiration, coughing ability and vital capacity.
- Describe how the level of lesion is ascertained.
- Treatment: Describe the stages of immobilization & stage when weight bearing is allowed, Describe spinal orthosis. Demonstrate motor re-education program and program for respiratory care in high level paraplegics and quadriplegics. Demonstrate progressive amputation, mat exercises, various strengthening program, methods of decreasing spasticity and improving sitting balance.
- Demonstrate paraplegic gaits and re-education in functional activities: transfer and protective falling. Describe common ambulatory aids used in paraplegics and common splints used in tetraplegics.
- Describe the use of Hydrotherapy in paraplegics. Describe the concept of team approach in rehabilitation of patients.

I. HEMIPLEGIA:

- Define hemiplegia and identify the following: Sensory disturbance, alterations in tone, loss of selective movement, loss of balance reactions and communications problems.
- Treatment: Describe the unilateral and bilateral approaches to treatment, Describe positioning in the supine position, on the affected and on the unaffected sides. Demonstrate activities in the recumbent position arm mobilization. Trunk elongation-scapular movement, arm elevation, activities for a recovering arm: activities for the lower limb. i.e. hip and knee flexion over the side of the bed, knee extension with dorsiflexion, hip control, and isolated knee extension
- Mat activities: demonstrate rolling on to affected and unaffected sides, sitting and kneeling.
- Describe the technique of making a patient sit passively and active assisted in sitting: Demonstrate Transfer Technique.
- Describe activities in sitting: equal weight transference on both buttocks shuffling on buttocks, weight transfer through arms balance reaction on truck.- head.
- Demonstrate activities in the standing position : standing from plinth, from chair (assisted and independent), weight bearing on affected leg, knee, control in stand weight transfers forward, backward and side wards, Gait training and stair climbing.
- Describe till board activities in the lying and sitting positions. Describe additional methods of stimulation using verbal cues, ice, pressure & tapping.
- Describe management of shoulder pain and shoulder hand syndrome. Identify and describe hemiplegics gait, identify synergy components and abnormal reflex activities.
- Demonstrate reeducation of gait: motor relearning techniques functional approach and use of orthosis.

J. CEREBELLAR LESIONS:

- Identify and assess abnormal tone, decomposition of movement. Rapid alternate movements, hypotonia, proprioception, dysmetria, posture and gait.
- Treatment: Demonstrate exercises for incoordination - Frenkel's and weighted exercises. Demonstrate techniques for reeducation of balance and equilibrium reactions by visual compensation.
- Describe use of appropriate aids for ambulation depending on the severity of affection - walker, elbow crutches, quadruped, walking sticks, etc.

K. POLIOMYELITIS:

- Define poliomyelitis and review the stages in the disease –acute, recovery and residual paralysis.
- Describe treatment in the acute stage: heat chest care, positioning.
- Describe the assessment of a patient in the recovery stage: active and passive range of motion, soft tissue tightness, muscle power & spinal deformities.
- Demonstrate treatment in the recovery stage: muscle strengthening – progress resistive exercises. Describe the role of suspension and hydrotherapy.
- Describe the treatment of soft tissue tightness by passive stretching, auto stretching pre-operative assessment of contractures: hip flexion, TA contracture, knee flexion and foot deformities. Review orthotic aids commonly used the management of polio.
- Describe tendon transfer operations commonly performed. Describe functional retraining for self care, gait training and posture correction.

Section-II**PHYSIOTHERAPY IN PEDIATRIC CONDITIONS**

- A. Review the physiotherapy examination and treatment of a pediatric patient.
- B. Review of pathological change and principle of management by physiotherapy of the following conditions:
 - 1) Common congenital and acquired neurological disorders (CNS & PNS)
 - 2) Common heredity disorders.
 - 3) Common nutritional, metabolic & vitamin deficiency disorders
 - 4) Cerebral palsy, myopathy and muscular dystrophies.

Section-III**PHYSIOTHERAPY IN GERIATRIC CONDITIONS**

- A. The ageing process- Loss of reserve, altered homeostasis and how these may affect pathological processes.
- B. Review of the physiotherapy examination & assessment of Geriatric patient.
- C. Review of pathological changes and principle of management by physiotherapy of the following conditions:
 - 1) Neurological disorders (CNS & PNS)
 - 2) Injuries & accidents specific to the aged.
 - 3) Falls
 - 4) Urine & fecal incontinence.
 - 5) Prevention & cause of bed sores.

Practical

Various Physiotherapy modalities and treatment techniques for above mentioned conditions should be demonstrated and practiced by the students.

Books Recommended:

1. Cash's textbook of neurology for physiotherapists – Dowani – J.P. Brothers.
2. Adult Hemiplegia – Evaluation & treatment – Bobath – Oxford Butterworth Heinman
3. Neurological Rehabilitation – Carr & Shepherd – Butterworth Heinman
4. Tetraplegia and paraplegia – A guide for physiotherapist – Bromley – Churchill Livingstone.

5. Neurological physiotherapy – A Problem solving approach – Susan Edwards – Churchill Livingstone.
6. Neurological Rehabilitation – Umphred – Mosby.
7. Geriatric physical therapy – Gucciona – Mosby.
8. Motor assessment of Developing Infant – Piper & Darrah – W.B. Saunders.
9. Paediatric physical therapy – Teckling Lippincott.
10. Treatment of cerebral Palsy and motor Delay – Levitts- Blackwell Scientific Publications, London.
11. Aging the Health care Challenge – Levis- F.A. Davis.
12. Physiotherapy in Paediatrics – Shepherd – Butterworth Heinman.

B.P.T. 4th YEAR

PAPER -PHYSIOTHERAPY IN MEDICAL & SURGICAL CONDITIONS

CODE-B403

THEORY---70

Course Objective:-

- I. The students will be able to understand the different types of incisions, their complications, their pre & post operative physiotherapy management.
- II. The students will be able to understand different medical conditions & their physiotherapy treatment.
- III. The students will be able to assess the patients will different kind of organ transplants like bone marrow transplant, heart transplant, liver transplant & their physiotherapy management.
- IV. The students will be able to define burn, its assessment on the basis of depth & percentage, different types of grafting & its physiotherapy management.
- V. The students will be able to understand the different kind of operative procedures of reproductive systems like MTP, D&C, D&E, LSCS & ante natal & post natal physiotherapy management.
- VI. The students will be able to understand different kind of neurosurgeries like craniotomy, cranioplasty & their physiotherapy management.
- VII. The students will be able to understand the abdominal surgeries like mastectomy, hysterectomy, cholecystitis & their physiotherapy management.

Section-I

General Medicine:-

1. Review of the Pathological and principles of management by physiotherapy to the following conditions.
2. Inflammation – acute, chronic and suppurative
3. Edema-Traumatic, Obstructive, Paralytic, Edema due to poor muscle and laxity of the fascia.
4. Arthritis and Allied conditions (in details):
 - a) Osteo- Arthritis-generalized, Degenerative and traumatic, Spondylosis and disorders.
 - b) Rheumatoid Arthritis, Still's disease, infective Arthritis.
 - c) Spondylitis, ankylosing spondylitis.
 - d) Nonarticular Rheumatism- Fibrositism, Myalgia, bursitis, peri arthritis etc.
5. Common conditions of Skin-Acne, Psoriasis, Alopecia, Leucoderma, leprosy, Sexually transmitted diseases.
6. Deficiency disease- Rickets, Diabetes, Obesity, Osteoporosis and other deficiency disorders related to physiotherapy.
7. Psychiatric Disorders- Psychosis, Psychoneurosis, Senile dementia.

Section-II

General Surgery, Gynaecology & Obstetrics and ENT.

Review of pathological changes and principle of pre and post operative management by physiotherapy of the following conditions:

- 1) Common abdominal surgeries. Including GIT, liver, spleen, Kidney, bladder etc.
- 2) Common operation of reproductive system, including surgical intervention for child delivery. Ante natal & post natal, physiotherapy.
- 3) Common operations of the ear, nose, throat & Jaw as related to physiotherapy.

- 4) Common organ transplant surgeries – heart, liver, bone marrow etc.

Wounds, Burns & Plastic Surgery.

Review of pathological changes and principle of pre and post operative management by physiotherapy of the following conditions:

- 1) Wounds, ulcers, pressure sores:
- 2) Burns & their complications.
- 3) Common reconstructive surgical proceedings of the management of wounds, ulcers, burns & consequent contractures & deformities.

Neurosurgery.

Review of pathological changes and principle of pre and post operative management by physiotherapy of the following conditions.

- 1) Common surgeries of the cranium & brain.
- 2) Common surgeries of vertebral column & spinal cord.
- 3) Common surgeries of peripheral nerves.
- 4) Surgical interventions in traumatic head injuries.

Section- III

Physiotherapeutic Management of Medical & surgical conditions

Physiotherapeutic management of all the above mentioned minor and major medical & surgical conditions.

Book Recommended:

1. Cash textbook of general medical and surgical conditions for physiotherapists- Downie Jaypee Brothers.
2. Cash textbook of heart, chest and vascular disorders for physiotherapists- Downie Jaypee Brothers.
3. Principle and practices of cardiopulmonary physical therapy – Frown Felter- Mosby.
4. Chest physiotherapy in intensive care unit- Mackenzie – Williams & Wilkins.
5. Restoration of motor functions in stroke patient: A Physiotherapist approach- Johnstone Churchill Livingstone.
6. Physiotherapy Obstetrics and Gynecology – Polden – F.A. Davis.

B.P.T. 4th YEAR

PAPER - PHYSIOTHERAPY IN CARDIOTHORACIC CONDITIONS

CODE-B404

THEORY---70

Course Objectives:-

- i. The student will learn the assessment of patient with a cardiopulmonary conditions.
- ii. The student will learn the techniques within Bronchial Hygiene Therapy.
- iii. The student will be informed about the various invasive and non- invasive techniques of investigation in the patients with cardiopulmonary conditions.
- iv. The student will be able to conduct a safe and effective treatment of patient with cardiopulmonary conditions.

Section-I

Respiratory

1. Review of mechanism of normal respiration (rate, rhythm, use of accessory muscles)
2. Chest examination, including auscultation, percussion (Symmetry of chest movement)
3. Knowledge of various investigative procedures (invasive & non invasive) use in the diagnosis of various respiratory disorders.
4. Chest deformities (Barrel chest, pigeon chest)
5. Measurement: Chest expansion at different levels.
6. Techniques of physical treatment: Breathing exercise, Chest mobilization exercises Postural drainage. Huffing, coughing, Vibratory chest shaking & percussion.
7. Brief idea about cardiothoracic procedure like suction, mechanical ventilation, AMBU Bag, extubation care.

Review of the Pathological and principles of management by physiotherapy to the following conditions.

- 2.) Bronchitis, Asthma, Lung abscess, Bronchiectasis, Emphysema, COPD
- 3.) Pleurisy and Empyema, Pneumonia
- 4.) Pulmonary tuberculosis
- 5.) Lung Abscess, Pneumonia,
- 6.) Bacterial Disease.
- 7.) Rheumatic fever, Carcinoma of respiratory tract.
- 8.) Paralysis of diaphragm & vocal cords.
- 9.) Chest wall deformities
- 10.) Principles of intensive case physiotherapy, Aerosol Therapies, Humidification therapy

Section-II

Cardiovascular

- 1) Review of anatomy and physiology of the cardiovascular system.
- 2) Knowledge of various investigative procedures (invasive & non invasive) used in the diagnosis of various cardiovascular disorders.
- 3) Review of pathological changes and principle of management by physiotherapy of the following conditions:
Thrombosis, Embolism, Burger's diseases, Arteriosclerosis, Thrombophlebitis, Phlebitis,

Gangrene, Congestive Cardiac failure, Hypertension, Hypotension, Aneurysm, Congenital heart disease, Cardiac myopathies, ischemic heart disease, endocarditis and pericarditis.

Section- III

Thoracic Surgery

Review of pathological changes and principle of pre and post operative management by physiotherapy of the following conditions.

- 1) Lobectomy, Pneumonectomy, Thoracotomy, Thoracoplasty, Endoscopy.
- 2) Corrective surgeries of congenital heart defects, angioplasties, blood vessel grafting, open heart surgeries & heart transplant.
- 3) Principles, modes, indication of mechanical ventilation.

Section- IV

Physiotherapeutic Management of cardiothoracic conditions

Physiotherapeutic management of all the above mentioned minor and major cardiac thoracic conditions.

Book Recommended:

1. Cash Textbook of general medical and surgical conditions for physiotherapists- Donnie Jaypee Brothers.
2. Essential of Cariopulmonary physical therapy- Hillegass & Sadowsky- W,B. Saunders.
3. Cash textbook of Chest, Heart and Vascular Disorders for physiotherapists- Downie- J.P. Brothers.
4. The Brompton Guide to chest physical therapy
5. Cardiopulmonary Physical Therapy- Irwin and Tecknin, Mosby.
6. Cardiovascular/Respiratory physiotherapy- Smith & Ball- Mosby
7. ACSM Guidelines for exercise testing and prescription- ACSM- Williams and Wilkins.
8. Chest physiotherapy in intensive care unit- Mackenzie et al – Williams and Wilkins.

B.P.T. 4th YEAR

PAPER - RATIONALE OF REHABILITATION

CODE-B405

THEORY---70

Course Objectives:-

- I. The student will be informed about the organization & administration of rehabilitation units.
- II. The student will be informed about the rehabilitation therapy & its principles.
- III. The student will be informed about the orthotic & prosthetics.
- IV. The student will be able to differentiate between impairment, disability and handicap.
- V. The student will be informed about the role of and difference between Community and Institute based rehabilitation.
- VI. The student will be informed about the various management programmes for communication impairment, social problems, occupational and vocational rehabilitation.
- VII. The student will be informed about the parts of wheel chair & various architectural barriers.

PRINCIPLES OF ORGANIZATION & ADMINISTRATION OF REHABILITATION UNITS.

- a) Principles of relationship between the institution and the guardians of the handicapped or patient.
- b) Principle of relationship between head of the unit with various government and semi-government, trusts and juniors.
- c) Relationship between a staff and his supervisor's equals and juniors.
- d) Principle of maintaining department secrecy, handling difficult problems of day to day work.
- e) Definition of policy and how best it is to be carried out.
- f) Methods of teaching to handicapped and other workers in rehabilitation Unit.
- g) Principles of teaching and guiding student's juniors and senior in O.T. and P.T. training schools and centers.
- h) International classification of disability.
- i) Socio legal aspect of rehabilitation.

REHABILITATION THERAPY:

- I. a) Philosophy and need of rehabilitation.
- b) Principles of physical Medicine.

II . Delivery of Rehabilitation care & team

III. a) Principles of Orthotics and prosthetics.

- i) Lower extremity Orthotics.
 - ii) Spinal Orthotics
 - iii) Upper Extremity Orthotic.
-
- b) i) Lower Extremity Prosthetics.
 - ii) Upper Extremity Prosthetics

IV. Walking and ambulatory Aids

- i) Wheel Chair
- ii) Crutches and Canes

V. Principle of Management of Communication Impairment.

- i) Speech production
- ii) Communication disorders secondary to brain damage.
- iii) Aphasia and its treatment.
- iv) Dysarthria and its treatment.
- v) Non- aphasic Language disorders.

VI. a) Principles in management of social problems.

- i) Social needs of the patient.
- ii) Rehabilitation center environment.
- iii) The social worker as a member of the rehabilitation team.
- iv) Contribution on social work.
- v) Community Resources.

b) Principle in Management of Vocational problems and occupational therapy.

- i) Vocational Evaluation.
- ii) Vocational Goals for the severely disabled.

VII. Architectural barriers & ADL

VIII. Rehabilitative management of the following conditions:

- i) Rehabilitation of Congenital Malformations, cerebral palsy, poliomyelitis, brain injury, stroke and peripheral nerve injuries.
- ii) Rehabilitation of muscular dystrophy, spinal cord injury, burns, arthritis and fractures.
- iii) Sports rehabilitation & exercises for positive health.
- iv) Common deformities and the role of surgery in rehabilitation.
- v) Rehabilitation of cardiac, pulmonary, vascular and hematological conditions.

Book Reference:-

- 1. Text book of Rehabilitation –Sunder
- 2. Directory for disabled people.
- 3. Physical medicine and Rehabilitation –Joel A.Delisa.
- 4. Physical medicine & rehabilitation- Okawanta.
- 5. Community diagnosis & Health action- Bennerth.
- 6. Hand book of Physical medicine & rehabilitation- Rusk.