

|                              |                                  |
|------------------------------|----------------------------------|
| <b>Branch Name:</b>          | <b>BACHELOR OF PHYSIOTHERAPY</b> |
| <b>Program Code:</b>         | <b>PT101</b>                     |
| <b>Course Title:</b>         | <b>HUMAN ANATOMY</b>             |
| <b>Course Code:</b>          | <b>2PT1010101</b>                |
| <b>Pre-requisite Course:</b> | <b>- NONE -</b>                  |

### Teaching and Examination Scheme:

| Teaching Scheme (Hours per week) |          |           | Credit | Evaluation Scheme (Marks) |                       |                       |                       |             |           |
|----------------------------------|----------|-----------|--------|---------------------------|-----------------------|-----------------------|-----------------------|-------------|-----------|
| Lecture                          | Tutorial | Practical |        | Theory(T)                 |                       | Practical(P)          |                       | Total Marks |           |
|                                  |          |           |        | University Assessment     | Continuous Assessment | University Assessment | Continuous Assessment | Theory      | Practical |
| 3.5                              | -        | 4.5       | 11.5   | 80                        | 20                    | 80                    | 20                    | 100         | 100       |

### COURSE OUTCOMES:

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

1. Acquire the knowledge of structure of human body in general.
2. Understand the regional anatomy in detail.
3. Anatomical changes right from embryonic period till old age.
4. Understand histological features of various organs.
5. Understand its application in medical science.

### Subject Contents:

| Sr. No. | Topic                                                                                                                                                                             | Total Hours |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| 1       | <b>General Introduction:</b><br>a) Definitions and subdivisions<br>b) Plan of human body<br>c) System of the body<br>d) The unit of structure and function of the cell            | 20          |
| 2       | <b>Histology: (Not For University Examination)</b><br>a) Cell<br>b) Tissues of the body<br>c) Epithelium<br>d) Connective tissue<br>e) Cartilage<br>f) Bone<br>g) Lymphoid tissue | 05          |

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |    |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 3 | <b>Embryology: (Not For University Examination)</b><br>a) Ovum, spermatozoa, fertilization and formation of germ layers and their derivations<br>b) Development of skin, fascia, blood vessels and lymphatics<br>c) Neural tube, brain vessels, spinal cord<br>d) Development of brain and brainstem structures, developmental anomalies (brief)<br>e) Development of bones, axial and appendicular skeleton and muscles                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 05 |
| 4 | <b>Musculoskeletal anatomy: (all topics to be taught in detail) Osteology:</b><br>a) Anatomical positions of the body, axes, planes, common anatomical terminologies (grooves, tuberosity, trochanters etc)<br>b) Connective tissue classification<br>c) Bones:- Composition and functions, classification of types according to morphology and development, growth and repair, structure of long bone, vertebral column, types of vertebrae, bones of extremities and body landmarks<br><b>Arthrology:</b><br>a) Definitions<br>b) Classification of joints<br>c) Construction of joints<br>d) Motions of joints<br>e) Structure of fibrous, cartilaginous joints<br>f) Blood supply and nerve supply of joints<br>g) Articulations – articular surfaces, types of joints, motions of upper and lower extremities, trunk, head<br><b>Myology:</b><br>a) Types of muscle tissue<br>b) Muscles of upper extremity, lower extremity, trunk, eye, face etc. origin, insertion, nerve supply and action (in detail)<br><b>Myology of other systems:</b><br>a) Cardiovascular system<br>b) Blood lymph, tissue fluid-characteristics, composition, and function<br>c) The heart-main arteries, veins, capillaries<br>d) Lymph circulation | 42 |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |    |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 5  | <b>Neuro-anatomy</b><br>a) Division and function of the nervous system<br>b) Brain, spinal cord-their structures, division<br>c) Nerve tissue-neuron, nerve fibre, synapse, end-organs etc<br>d) Organization of Central Nervous System-spinal nerves and autonomic nervous system-mainly pertaining to cardiovascular, respiratory and urogenital system.<br>e) Cranial nerves<br>f) Peripheral nervous system-Peripheral nerves, sensory and organs, neuromuscular junction, spinal segments and areas<br>g) Nerve supply to voluntary muscles and segmental distribution<br>h) Central nervous system-Brain, cerebellum, Thalamus, Hypothalamus, Corpus striatum, Cerebral hemispheres – white and gray matter, lateral ventricles, blood supply of brain, meninges, pyramidal system, extrapyramidal systems, anatomic integration.<br>i) Cerebro-spinal fluid<br>j) Sensory end-organs and sensations<br>k) Autonomic nervous system-sympathetic, parasympathetic | 42 |
| 6  | <b>Respiratory System:</b><br>a) Thoracic cage<br>b) Brief outline of air passages<br>c) Brief gross anatomy of respiratory organs-lungs, pleura, bronchial tree, broncho-pulmonary segments<br>d) Intercostals muscles in detail<br>e) Mechanisms of respiration and muscles of respiration, Diaphragm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 15 |
| 7  | <b>Cardiovascular System:</b><br>a) Heart (gross anatomy and functions)<br>b) Arteries<br>c) Veins<br>d) Collateral Circulation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 15 |
| 8  | <b>Digestive System:</b><br>a) Anatomy of digestive organs – Oesophagus, stomach, intestine, rectum etc<br>b) Digestive glands                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 10 |
| 9  | <b>Urinary System:</b><br>a) Anatomy of urinary organs, kidneys, ureters, urinary bladder urethra in males and females etc.<br>b) Types of bladder especially in paraplegics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 10 |
| 10 | <b>Reproductive System:</b><br>a) Brief outline of genital organs<br>b) Outline of male and female reproductive system                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 05 |
| 11 | <b>Endocrine System:</b><br>a) Glands – classification, sites and section<br>b) Enzymes<br>c) Hormones                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 05 |

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 12 | <b>Lymphatic System</b> – Brief outline                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 05           |
| 13 | <b>Special sensory organs and sensations:</b><br>a) Emphasis on skin, ear and eyes<br>b) Less detail on smell and taste                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 05           |
| 14 | <b>Regional Anatomy:</b><br><b>Upper Extremity:</b><br>a) Osteology: Clavicle, Scapula, Humerus, Radius, Ulna, Carpals, Metacarpals, Phalanges in articulated hand<br>b) Soft parts: Breast, pectoral region, axilla, front of arm, cubital fossa, front of forearm, back of forearm, palm, dorsum of hand, muscles, fascia, nerves, blood vessels and lymphatic drainage of upper extremity<br>c) Joints: shoulder girdle, shoulder joint, elbow joint, radio-ulnar joint, wrist joint and joints of hand<br>d) Arches of hand, skin of the palm and dorsum of hand<br><br><b>Lower Extremity</b><br>a) Osteology: Hip bone, femur, tibia, fibula, patella, tarsals, metatarsals, phalanges.<br>b) Soft parts: Gluteal region, front and back of thigh {femoral triangle, femoral canal and inguinal canal}, medial side of the thigh {adductor canal}, lateral side of the thigh, popliteal fossa, anterior and posterior compartment of leg, sole of the foot, lymphatic drainage of lower limb, venous drainage of the lower limb, arterial supply of the lower limb, arches of the foot, skin of foot. | 35<br><br>45 |
|    | <b>Trunk Osteology:</b><br><b>Cervical, thoracic, lumbar, sacral and coccygeal vertebra and ribs.</b><br>a) Soft tissue: Pre and Para vertebral muscles, anterior abdominal wall muscles, intervertebral disc.<br>b) Joints: Hip joint, knee joint, ankle joint, joints of the foot.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 20           |
|    | <b>Head and neck</b><br>a) Osteology: Mandible and bones of the skull.<br>b) Soft parts: Muscles of the face and neck and their nerve and blood supply – Extraocular muscles, salient points about the eye ball and internal ear.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 20           |

**Dissection Note:**

1. Dissection of upper and lower limbs & back.
2. Identification of anterolateral abdominal wall, posterior abdominal wall & thoracic cage.
3. Anatomical position & description of all bones.
4. Surface marking in cadaver and living body.
5. Radiological examination of upper limb, lower limb & other special X-rays.
6. In BRAIN: Identification of all parts and various sections at different levels.

### List of References:

#### Text Books:

1. B.D. Chaurasia- Human Anatomy Vol 1, 2,3- 8<sup>th</sup> Edition
2. B.D. Chaurasia- General Anatomy- 6<sup>th</sup> Edition

#### Reference Books:

1. Textbook of Clinical Neuroanatomy, Vishram, Singh- 2<sup>nd</sup> & 4<sup>th</sup> Edition.
2. Atlas of Anatomy, Gilroy, Anne, Macpherson B- South Asian Edition.
3. I.B. Singh's Textbook of Human Histology with Colour Atlas and Practical Guide. Vasudeva, Neelam- 7<sup>th</sup> Edition.
4. Clinical Anatomy, Snell, Richard S- 9<sup>th</sup> Edition.
5. Dissection Manual with Regions & Applied Anatomy upper Extremity and Thorax Volume-1, Navis, Mercy- 1<sup>st</sup> Edition
6. Dissection Manual with Regions & Applied Anatomy Head, Neck and Brain Volume-3, Navis, Mercy- 1<sup>st</sup> Edition.

### List of Open Source Software/learning website:

- [k-hub.in](https://k-hub.in) e library/A single platform for all e resources (K-hub, E-Resource)
  - User Name- KB4605VNG
  - Password- BL@69BX!
- [knowledgegainer.delnet.in](https://knowledgegainer.delnet.in) (Delnet, E-Resource)
  - User Name- gjspum
  - Password- spu10924

### Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

| CLO  | Description                                                                                                                                                                                                | Bloom's Taxonomy Level                         |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| CLO1 | Understand and identify all Anatomical structure of human body.                                                                                                                                            | 2 Understanding<br>3 Applying                  |
| CLO2 | Enumerate the histological features of various organs.                                                                                                                                                     | 1 Remembering<br>2 Understanding               |
| CLO3 | Correlate specific structural features of human cells, tissues, organs and systems of the human body with their normal functions, and identify the changes that occur during human development and ageing. | 1 Remembering<br>2 Understanding<br>3 Applying |
| CLO4 | Evaluate diseases associated with human anatomy and identify various conditions associated with anatomical structures.                                                                                     | 1 Remembering<br>2 Understanding<br>3 Applying |

|      |                                                                                               |                          |
|------|-----------------------------------------------------------------------------------------------|--------------------------|
| CLO5 | Analyze the various body parts' applied anatomy and how it is used in physiotherapy practice. | 3 Applying<br>5 Evaluate |
| CLO6 | Apply and gain information gained in health sciences                                          | 3 Applying<br>6 Creating |

### Mapping of CLOs with Pos & PSOs

| Course<br>Learning<br>Outcomes | Program Outcomes (POs) |     |     |     |     |     |     |     | Program Specific Outcomes (PSOs) |      |      |      |      |      |      |      |
|--------------------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|----------------------------------|------|------|------|------|------|------|------|
|                                | PO1                    | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1                             | PSO2 | PSO3 | PSO4 | PSO5 | PSO6 | PSO7 | PSO8 |
| CLO1                           | H                      |     |     |     |     |     |     |     | H                                |      |      | M    |      |      |      |      |
| CLO2                           |                        |     | H   |     |     |     |     |     |                                  | M    |      |      | L    |      |      |      |
| CLO3                           |                        |     | H   |     |     |     |     |     |                                  |      |      |      |      | M    |      |      |
| CLO4                           |                        | M   |     | H   |     |     |     |     |                                  |      | M    |      |      |      |      |      |
| CLO5                           |                        |     | M   |     |     | M   |     | L   |                                  |      |      |      |      |      | H    |      |
| CLO6                           |                        |     |     |     | M   |     | L   |     |                                  |      |      | L    |      |      |      | M    |

**H= High M=Medium L=Low**