

Semester III

Human Physiology and Anatomy-II

Marks: 150

This syllabus is extension of the part I. The syllabus justifiably divides the body systems into two semesters to ensure complete and comprehensive knowledge of all functionalities of the body. The course curriculum therefore emphasizes on the cardiovascular, respiratory, reproductive and endocrine system and their interrelatedness. The Laboratory exercises are designed to substantiate and clarify the theoretical concepts. Most of the topics are of introductory level and would stimulate the students to understand the basic functioning of every system and the resultant unified organization thereupon.

THEORY

Total Lectures: 48

Unit I: Cardiovascular system (Chapter 13 and 14: Fox)

(09 Lectures)

Structure and function of heart, Properties of cardiac muscle. The Cardiac Cycle, Electrocardiogram. Circulatory system: General principles of circulation and hemodynamics Cardiovascular regulatory mechanism, Lymphatic circulation and microcirculation. Basic concepts of angina, atherosclerosis and Cardiac failure

Unit II: Respiratory system (Chapter 16: Fox; Chapter 39: Guyton)

(07 Lectures)

Functional Anatomy of the respiratory system. Mechanisms of pulmonary ventilation, alveolar ventilation, gaseous exchange, transport of gases, respiratory and nervous control and regulation of respiration. An overview about cough, hypoxia, asthma and bronchitis. Basic concepts of physiology of exercise.

Unit III: Renal physiology: (Chapter 17: Fox; Chapter 27: Guyton)

(09 Lectures)

Functional Anatomy of kidney, function and histology of nephron, Body fluid and electrolytes: their balances and imbalances. Urinary bladder: structure, Urine formation (glomerular filtration and tubular reabsorption), micturition and its regulation, renal regulation of urine volume and osmolarity, acid-base balance. Acidosis and alkalosis, basic concepts about kidney dysfunction and disorders of urination

Unit IV: Reproductive system (Chapter 20: Fox; Chapter 81: Guyton)

(09 Lectures)

Structure and function of male and female reproductive organ and tract. Function and regulation of testicular and ovarian hormones. Gametogenesis (oogenesis and spermatogenesis),

fertilization, implantation, pregnancy, parturition and lactation and neonatal physiology. Basic concepts of male and female infertility, menopause and various contraceptive measures.

Unit V: Endocrine system (09 Lectures)
(Chapter 11: Fox; Chapter 74: Guyton)

General mechanism of hormone action, Structure, function and regulation of the following glands and their secretions: Pituitary, Hypothalamus, Pineal, Thyroid, parathyroid, adrenal, Thymus, Pancreas. Basic concepts about hypo and hyper secretion of hormones and their diseases.

Unit V: Skeletal System (05 Lectures)
(Chapter 6: Tortora)

Cartilage: Structure, function and types. Bones: Structure, function, location and types. Joints: structure, function and types. An overview of disorders of skeletal system: arthritis, gout, fractures, osteoporosis.

PRACTICALS

1. To study the sperms and their motility (from different regions of epididymis).
2. Simple Reflex arc.
3. Physiological data acquisition based experiments. (ECG)
4. Physiological data acquisition based experiments. (EMG)
5. To prepare temporary slide of neuron from goat spinal cord.
6. To perform platelet count
7. To perform tests for sensations. (taste, touch and smell)
8. Blood Pressure recordings in humans.
9. Lung Function tests in humans.

10. To study various types of contraceptive (condoms, IUD's, oral and injectable contraceptives)
11. To study different human organs and their sections through permanent slides.
T. S. of thyroid, liver, thymus, spleen, ovary, artery, vein, capillaries, testis, pancreas, adrenal, kidney (cortex and medulla), urinary bladder, urethra, fallopian tubes, epididymis, prostate glands, lungs, trachea, bronchioles, pituitary, heart.

ESSENTIAL BOOKS

1. Guyton and Hall Textbook of Medical Physiology, 11th edition (2006), J. E. Hall; W B Saunders and Company.
2. Human Physiology, 9th edition (2006), Stuart I. Fox; Tata McGraw Hill.
3. Principles of Anatomy and Physiology, 13th edition (2011), Gerard J. Tortora and Bryan H. Derrickson; Wiley and Sons.

SUGGESTED READINGS

1. Lab Manual on Blood Analysis and Medical Diagnostics, 1st edition (2012), Dr. Gayatri Prakash; S. Chand.
2. Ganong's Review of Medical physiology, 24th Edition (2012), K. E. Barrett, S. M. Barman, S. Boitano and H. Brooks; Tata McGraw Hill.
3. Textbook of Practical Physiology, 7th Edition (2007), CL Ghai; Jaypee Publication.