

**T.C.**

**LOKMAN HEKIM UNIVERSITY**

**FACULTY OF MEDICINE**

**PHASE – II**

**2023 – 2024 EDUCATION TEACHING GUIDE**

**T.R.**

**LOKMAN HEKIM UNIVERSITY FACULTY OF MEDICINE**

**PHASE II COURSES and ECTS**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CODE** | **COMPULSORY COURSES** | **T** | **P** | **C** | **ECTS** |
|  | **BASIC MEDICAL SCIENCE – II (Phase II)** | **523** | **96** | **619** | **55** |
| *21020001* | *Nervous System and Special Senses* | *86* | *24* | *110* | *11* |
| *21020002* | *Circulatory, Respiratory and Lymphatic Systems* | *107* | *20* | *127* | *12* |
| *21020003* | *Gastrointestinal System and Metabolism* | *90* | *14* | *104* | *10* |
| *21020004* | *Urogenital and Endocrine Systems* | *76* | *14* | *90* | *8* |
| *21020005* | *Basis of Diseases* | *87* | *10* | *97* | *10* |
| *21020006* | *Scientific and Clinical Approaches* | *77* | *14* | *91* | *4* |
| **TOTAL ECTS COMPULSORY** | | | | | **55** |
|  | | | | | |
| **CODE** | **ELECTIVE COURSES** | **T** | **P** | **C** | **ECTS** |
|  | University Elective 1 | 2 | 2 | 3 | 3 |
|  | University Elective 2 | 2 | 2 | 3 | 3 |
|  | University Elective 3 | 2 | 2 | 3 | 3 |
|  | University Elective 4 | 2 | 2 | 3 | 3 |
|  | Faculty Elective 1 | 2 | 0 | 2 | 4 |
|  | Faculty Elective 2 | 3 | 0 | 3 | 4 |
|  | Faculty Elective 3 | 1 | 1 | 2 | 4 |
|  | Faculty Elective 4 | 2 | 0 | 2 | 4 |
| **TOTAL ECTS TO BE COLLECTED AS ELECTIVES** | | | | | **12** |
| **TOTAL ECTS TO BE COLLECTED IN PHASE II** | | | | | **67** |

**PHASE II OBJECTIVES AND LEARNING OUTCOMES**

**Aim:**

In this phase, the main subjects are the organ systems of the human body. The students will learn the anatomy, development, histology, physiology, biochemistry, molecular biology, immunology, and biophysics of the organs. They will also get the basic theoretical information about the microbial agents settled in these systems and will form the basis of clinical courses by making practical applications. It is aimed to enable them to recognize the infectious and non-infectious diseases of the systems and to have basic knowledge about diseases. This phase is also providing students to improve the ability of biostatistical analysis and reasoning on the data related to clinical applications.

**Learning Objectives:**

**1.** Defines the anatomy, embryology, histology, physiology, and biophysics of the structures that make up the nervous system and special senses.

**2.** Explains the embryological development, histological and anatomical structures, physiological and biophysical features, functions of the cells, tissues and organs that make up the circulatory system, respiratory system and lymphatic system, and the relations of these systems with each other, respectively.

**3.** Defines the anatomical, developmental, histological, physiological, and biochemical features of the urogenital and endocrine systems.

**4.** Defines the anatomical, developmental, histological, physiological, and biochemical features of the gastrointestinal system and metabolism.

**5.** Defines the common and different characteristics of microorganisms that can cause infectious diseases in the gastrointestinal tract.

**6.** Learns basic biochemical, biological, pharmacological, microbiological, and pathological information for clinical and laboratory evaluations of diseases.

**7.** Explains the basic biostatistics techniques on research in the field of health.

**NERVOUS SYSTEM AND SPECIAL SENSES COURSE COMMITTEE**

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSES** | **THEORETICAL COURSE DURATION (h)** | **PRACTICAL**  **COURSE DURATION(h)** | **TOTAL**  **COURSE**  **DURATION(h)** |
| *21020001-01* Introduction to Committee | 2 | 0 | 2 |
| *21020001-02* Anatomy | 33 | 10 | 43 |
| *21020001-03* Biophysics | 10 | 0 | 10 |
| *21020001-04* Physiology | 28 | 10 | 38 |
| *21020001-05* Histology and Embryology | 13 | 4 | 17 |
| **TOTAL** | **86** | **24** | **110** |

**AIMS AND LEARNING OBJECTIVES OF THE COMMITTEE**

**Aim:**

In this committee, students learn the structures of the nervous system and the sensory organs, as well as the development of these structures and their functions by using basic physical approaches.

**Learning Objectives:**

**1.** Defines spinal cord morphology, functions, reflexes, lesions and ascending and descending pathways.

**2.** Defines the differences between presynaptic and postsynaptic potentials and the action potentials.

**3.** Defines the development of the nervous system and the development of the sensory organs, their functions, structures, and developmental anomalies of the cells of the sensory organs.

**4.** Defines the anatomy of the diencephalon, cranial nerves and autonomic nervous system, the brain stem, reticular formation, cerebellum, and the basic physics principles underlying the formation and measurement of biomedical potentials.

**5.** Defines the anatomy of the brain hemispheres, the relations between the sensory and motor cortex and basal ganglia, theories about EEG and sleep physiology, basic signal processing concepts and terminology.

**6.** Explains the meninges and sinuses, the vessels of the nervous system, the cerebrospinal fluid and its formation, possible ways of processing information in the central nervous system.

**7.** Defines the anatomy of eye and visual pathways, ear and auditory pathways, pain, touch, vibration, pressure senses and the mechanisms of recognizing objects.

**8.** Defines the biophysical processes that occur in the visual and auditory pathways.

**TOPICS**

|  |  |  |
| --- | --- | --- |
| **ANATOMY** | | |
| **Topic** | **Type** | **Time** |
| Introduction to the anatomy of the nervous system | Theoretical | 1 |
| Spinal cord | Theoretical | 1 |
| Truncus encephali (brain stem): medulla oblongata (bulbus), pons | Theoretical | 1 |
| Truncus encephali (brain stem): mesencephalon and cerebellum | Theoretical | 2 |
| Ascending tracts | Theoretical | 1 |
| Descending tracts | Theoretical | 1 |
| Diencephalon (midbrain): thalamus, subthalamus, epithalamus, hypothalamus, pituitary | Theoretical | 2 |
| Cranial nerves: I-VI | Theoretical | 1 |
| Cranial nerves: VII-XII | Theoretical | 1 |
| Vessels of the nervous system | Theoretical | 2 |
| Autonomic nervous system: sympathetic system | Theoretical | 1 |
| Autonomic nervous system: parasympathetic system | Theoretical | 1 |
| Meninges (cerebral membranes), sinus durae matrix (dural sinuses), cerebral ventricles and cerebrospinal fluid circulation | Theoretical | 2 |
| Epidural, subdural and subarachnoid spaces, cisternae subarachnoideae (subarachnoid cisterns) | Theoretical | 1 |
| Cerebral hemispheres: cerebral cortex, Brodmann areas | Theoretical | 2 |
| White matter and basal nuclei | Theoretical | 2 |
| Limbic system and the olfactory brain, sense of taste | Theoretical | 2 |
| Orbit and its contents | Theoretical | 2 |
| Eyeball and accessory structures of the eye | Theoretical | 1 |
| Visual pathways | Theoretical | 1 |
| Ear: External ear and middle ear | Theoretical | 3 |
| Ear: Internal ear, auditory and balance pathway | Theoretical | 2 |
| Spinal cord, Diencephalon, brainstem, cerebellum, cranial nerves | Practical | 2 |
| Meninges, dural venous sinuses, ventricles of the brain, epidural-subdural-subarachnoid spaces, and subarachnoid cisterns | Practical | 2 |
| Cerebral hemisphere, white matter, basal nuclei and the limbic system Vessels of the nervous system | Practical | 2 |
| Orbit and its contents, eyeball and accessory structures of the eye | Practical | 2 |
| Ear: External, middle, internal ear | Practical | 2 |
| **BIOPHYSICS** | | |
| **Topic** | **Type** | **Time** |
| Biophysical understanding of the concept of compound action potential and the process of recording it from the body | Theoretical | 1 |
| Mechanisms of formation of synaptic auditoria’s | Theoretical | 1 |
| Differences of pre- and post-synaptic potentials and action potentials | Theoretical | 1 |
| Biophysical principles of vision | Theoretical | 1 |
| Physical basis of color vision | Theoretical | 1 |
| Photoreceptors and electrophysiological processes | Theoretical | 1 |
| Basic physical concepts in hearing | Theoretical | 1 |
| Biophysical processes in the sense of hearing | Theoretical | 1 |
| Formation and characteristics of brain potentials | Theoretical | 1 |
| Spontaneous and stimulated electrical activities of the brain (EEG) | Theoretical | 1 |
| **PHYSIOLOGY** | | |
| **Topic** | **Type** | **Time** |
| Basic functions of synapses and neurotransmitters | Theoretical | 1 |
| Sensory receptors and neuron circuits in the processing of information | Theoretical | 1 |
| Motor functions of the spinal cord, spinal reflexes | Theoretical | 1 |
| Somatic senses | Theoretical | 3 |
| Control of motor function by the cortex | Theoretical | 2 |
| Cerebellum and motor functions | Theoretical | 2 |
| Basal ganglia and motor functions | Theoretical | 1 |
| Cerebral cortex | Theoretical | 1 |
| Learning and memory | Theoretical | 2 |
| Autonomic nervous system and adrenal medulla | Theoretical | 2 |
| Thalamus, hypothalamus, and limbic system | Theoretical | 2 |
| Physiology of vision | Theoretical | 2 |
| Physiology of central vision | Theoretical | 1 |
| Physiology of hearing | Theoretical | 2 |
| Physiology of balance | Theoretical | 2 |
| Physiology of taste and smell | Theoretical | 2 |
| Brain activity states – sleep, brain waves | Theoretical | 1 |
| Spinal cord reflexes | Practical | 2 |
| Reaction time | Practical | 2 |
| EEG | Practical | 2 |
| Vision tests | Practical | 2 |
| Hearing tests | Practical | 2 |
| **HISTOLOGY and EMBRYOLOGY** | | |
| **Topic** | **Type** | **Time** |
| Histology of central nervous system | Theoretical | 3 |
| Histology of peripheral nervous system and sensory receptors | Theoretical | 2 |
| Development of nervous system | Theoretical | 3 |
| Development and histology of eye globes and lids | Theoretical | 3 |
| Development and histology of ears | Theoretical | 2 |
| Practice: Histology of central nervous system | Practical | 2 |
| Practice: Histology of peripheral nervous system and sensory organs | Practical | 2 |

**CIRCULATORY, RESPIRATORY AND LYMPHATIC SYSTEMS COMMITTEE**

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSES** | **THEORETICAL COURSE**  **DURATION (h)** | **PRACTICAL**  **COURSE DURATION (h)** | **TOTAL COURSE DURATION (h)** |
| *21020002-01* Introduction to Committee | 1 | 0 | 1 |
| *21020002-02* Anatomy | 17 | 6 | 23 |
| *21020002-03* Biophysics | 12 | 0 | 12 |
| *21020002-04* Physiology | 37 | 8 | 45 |
| *21020002-05* Histology and Embryology | 20 | 6 | 26 |
| *21020002-06* Medical Microbiology | 20 | 0 | 20 |
| **TOTAL** | **107** | **20** | **127** |

**AIMS AND LEARNING OBJECTIVES OF THE COMMITTEE**

**Aim:**

This committee aims to explain the human circulatory system, respiratory system and lymphatic system and embryological development of cells, tissues and organs related with these systems, histological and anatomical structures, physiological characteristics, functions and mechanisms and their responses to changes in internal and external environmental conditions. It also aims to understand the infectious and non-infectious diseases related with these systems, and to have ability to interpret all basic sciences to the clinical courses.

**Learning Objectives:**

**1.** Explains the development and developmental anomalies of the circulatory system and the histological features of the cells of this system.

**2.** Explains regulation of the blood pressure, the anatomy and physiology of venous, lymphatic, coronary and pulmonary circulations.

**3.** Explain the excitability and contractility of the heart, the basic waves seen in the ECG and the cardiac cycle.

**4.** Learns the ECG measurements, pulse wave and heart sounds simultaneously throughout the cardiac cycle and the relationship between them.

**5.** Explains respiratory dynamics, alveolar ventilation, and ventilation mechanics with basic physics principles.

**6.** Explains the anatomy of the thoracic wall, the parts of the thoracic cavity, the main vessels, the lungs, the pleura, and the anatomy of the respiratory tract.

**7.** Explains the functions of the respiratory tract, the forces that provide inspiration and expiration, and the ventilation-perfusion relationship in the lungs.

**8.** Explains the effects of changes in respiration in different atmospheric pressures.

**9.** Explains the immune system and the immune cells.

**10.** Explains the anatomy of the lymphatic system and the embryology and histology of primary and secondary lymphoid organs.

**11.** Explains MHC molecules, endogenous and exogenous antigen presenting cells and vaccines.

**12.** Defines the immunogenetic structure of the lymphatic system.

**13.** Defines infectious diseases affecting the respiratory system and immune system cells.

**TOPICS**

|  |  |  |
| --- | --- | --- |
| **ANATOMY** | | |
| **Topic** | **Type** | **Time** |
| Lymphatic system and spleen | Theoretical | 2 |
| Heart and pericardium | Theoretical | 2 |
| Heart and pericardium, main vessels, fetal circulation, pulmonary circulation, systemic circulation | Theoretical | 2 |
| Thoracic wall and diaphragm | Theoretical | 2 |
| Root of the neck | Theoretical | 2 |
| The nose and paranasal sinuses | Theoretical | 2 |
| Larynx | Theoretical | 2 |
| Trachea and lungs | Theoretical | 2 |
| Mediastinum | Theoretical | 1 |
| Lab: Heart, pericardium, and main vessels | Practical | 2 |
| Lab: Thoracic wall, diaphragm, and root of neck | Practical | 2 |
| Lab: The nose, paranasal sinuses, and larynx Trachea, lungs, mediastinum | Practical | 2 |
| **BIOPHYSICS** | | |
| **Topic** | **Type** | **Time** |
| Biophysical properties of the heart muscle and contraction – relaxation processes | Theoretical | 2 |
| Biophysical bases of the formation of the heart dipole and ECGs | Theoretical | 1 |
| Biophysical discussion of the concepts of inotropy, preload and afterload in the heart | Theoretical | 2 |
| Circulation dynamics: Bernoulli and Poiseuille principles | Theoretical | 1 |
| Properties of blood as fluid and the concept of viscosity | Theoretical | 1 |
| Features of flexibility in the circulatory system | Theoretical | 1 |
| Biophysical properties of the respiratory system | Theoretical | 1 |
| Factors affecting respiratory dynamics | Theoretical | 1 |
| Alveolar mechanics and surface tension processes | Theoretical | 1 |
| Respiratory work, concepts of resistance and compliance | Theoretical | 1 |
| **PHYSIOLOGY** | | |
| **Topic** | **Type** | **Time** |
| General information about circulatory physiology | Theoretical | 2 |
| Physiological features of the heart muscle | Theoretical | 2 |
| Cardiac activity and its regulation | Theoretical | 2 |
| Heart valves and heart sounds | Theoretical | 2 |
| Heart cycle | Theoretical | 3 |
| Electrocardiogram (ECG) | Theoretical | 4 |
| Cardiac output and venous return | Theoretical | 2 |
| Blood pressure and pulse | Theoretical | 2 |
| Principles of hemodynamics | Theoretical | 1 |
| Local control of blood flow | Theoretical | 2 |
| Capillary circulation | Theoretical | 1 |
| Lymphatic circulation | Theoretical | 1 |
| General information about respiratory physiology | Theoretical | 1 |
| Alveolar ventilation | Theoretical | 2 |
| Ventilation – perfusion | Theoretical | 2 |
| Transport of oxygen and carbon dioxide | Theoretical | 2 |
| Regulation of respiration | Theoretical | 2 |
| Pulmonary function tests | Theoretical | 2 |
| Respiration at high altitude | Theoretical | 1 |
| Respiratory and cardiovascular regulation during exercise | Theoretical | 1 |
| Lab: ECG | Practical | 2 |
| Lab: Measurement of blood pressure and pulse | Practical | 2 |
| Lab: Pulmonary function tests | Practical | 2 |
| Lab: Heart sounds | Practical | 2 |
| **HISTOLOGY and EMBRYOLOGY** | | |
| **Topic** | **Type** | **Time** |
| Histology of immune system cells and primary lymphoid organs | Theoretical | 2 |
| Histology of secondary lymphoid organs and tissues | Theoretical | 3 |
| Histology of heart and vessels | Theoretical | 3 |
| Development of the heart | Theoretical | 2 |
| Development of the vessels and fetal circulation | Theoretical | 2 |
| Development of pharyngeal complex | Theoretical | 2 |
| Development of face and palate | Theoretical | 2 |
| Development of respiratory system | Theoretical | 1 |
| Histology of respiratory system | Theoretical | 2 |
| Development of the diaphragm, pericardium, and pleura | Theoretical | 1 |
| Practice: Histology of lymphoid organs and tissues | Practical | 2 |
| Practice: Histology of heart and vessels | Practical | 2 |
| Practice: Histology of respiratory system | Practical | 2 |
| **MEDICAL MICROBIOLOGY** | | |
| **Topic** | **Type** | **Time** |
| Immune system organs | Theoretical | 1 |
| Immune response stages | Theoretical | 1 |
| Cytokines | Theoretical | 1 |
| Developmental stages of immune cells | Theoretical | 1 |
| Immune cells-1 (lymphoid series) | Theoretical | 1 |
| Immune cells-2 (myeloid series, neutrophils, acute inflammation) | Theoretical | 1 |
| Immune cells-3 (myeloid series, other granulocytes, monocyte-  macrophage and dendritic cells) | Theoretical | 1 |
| Antigen presenting cells | Theoretical | 1 |
| Antigen, immunogen | Theoretical | 1 |
| Antibodies | Theoretical | 1 |
| Complement system | Theoretical | 1 |
| MHC molecules | Theoretical | 1 |
| Endogenous and exogenous antigen presentation | Theoretical | 1 |
| Hypersensitivity reactions | Theoretical | 2 |
| Vaccines | Theoretical | 2 |
| Mycobacteriaceae | Theoretical | 2 |
| Retroviridae | Theoretical | 1 |

**GASTROINTESTINAL SYSTEM AND METABOLISM COMMITTEE**

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSES** | **THEORETICAL COURSE DURATION (h)** | **PRACTICAL**  **COURSE**  **DURATION (h)** | **TOTAL**  **COURSE**  **DURATION (h)** |
| *21020003-01* Introduction to Committee | 1 | 0 | 1 |
| *21020003-02* Anatomy | 20 | 4 | 24 |
| *21020003-03* Physiology | 15 | 0 | 15 |
| *21020003-04* Histology and Embryology | 14 | 6 | 20 |
| *21020003-05* Medical Biochemistry | 20 | 2 | 22 |
| *21020003-06* Medical Microbiology | 20 | 2 | 22 |
| **TOTAL** | **90** | **14** | **104** |

**AIMS AND LEARNING OBJECTIVES OF THE COMMITTEE**

**Aim:**

In this committee, students will learn the anatomy, development, histology, physiology, and biochemistry of the gastrointestinal system and understand the basics of metabolism. It also explains the microorganisms that can cause infectious diseases in the system.

**Learning Objectives:**

**1.** Explains the details of the anatomical structures related to the gastrointestinal system and metabolism.

**2.** Describes the hormones, biomolecules, and the biochemical mechanisms.

**3.** Explains the physiology and the anatomy of the system and related organs.

**4.** Explains the histology and embryological development of the system.

**5.** Learns microbiological organisms which cause diseases in the system.

**TOPICS**

|  |  |  |
| --- | --- | --- |
| **ANATOMY** | | |
| **Topic** | **Type** | **Time** |
| Mouth anatomy, tongue, teeth, soft palate, and salivary glands | Theoretical | 2 |
| Temporal fossa, parotid region, and salivary glands | Theoretical | 1 |
| Infratemporal fossa, pterygopalatine fossa, and masticatory muscles | Theoretical | 2 |
| Pharynx, oesophagus, and stomach | Theoretical | 2 |
| Anterior abdominal wall, inguinal canal, rectus sheath | Theoretical | 2 |
| Peritoneum, omental bursa, greater omentum, and lesser omentum | Theoretical | 2 |
| Small intestine | Theoretical | 1 |
| Large intestine and anal canal | Theoretical | 2 |
| Liver, gallbladder, and biliary tract | Theoretical | 2 |
| Pancreas and spleen | Theoretical | 1 |
| Posterior abdominal wall and main vessels, spinal nerve plexuses | Theoretical | 2 |
| The portal system, porto-caval anastomosis, and cava-caval anastomosis | Theoretical | 1 |
| Lab: Temporal fossa, parotid region, salivary glands, infratemporal fossa, pterygopalatine fossa, and masticatory muscles | Practical | 1 |
| Lab: Mouth anatomy, tongue, teeth, soft palate, salivary glands, pharynx, oesophagus, and stomach | Practical | 1 |
| Lab: Anterior abdominal wall, inguinal canal, rectus sheath, peritoneum, omental bursa, greater omentum, and lesser omentum | Practical | 1 |
| Lab: Small intestine, large intestine, anal canal, liver, gall bladder, biliary tract, pancreas, and spleen, posterior abdominal wall and main vessels | Practical | 1 |
| **PHYSIOLOGY** | | |
| **Topic** | **Type** | **Time** |
| General principles: motility, electrical activity, and motor functions | Theoretical | 2 |
| General principles: GI control and hormones | Theoretical | 2 |
| Chewing and swallowing | Theoretical | 1 |
| Digestive tract secretory functions: small and large intestine | Theoretical | 2 |
| Exocrine secretions of the pancreas | Theoretical | 2 |
| Functions of the liver | Theoretical | 2 |
| Digestion and absorption in the gastrointestinal tract | Theoretical | 2 |
| Hunger, satiety, appetite, nausea, and thirst | Theoretical | 2 |
| **BIOCHEMISTRY** | | |
| **Topic** | **Type** | **Time** |
| Digestion and absorption of proteins | Theoretical | 1 |
| Digestion and absorption of carbohydrates and lipids | Theoretical | 2 |
| Metabolism of pancreatic gland hormones | Theoretical | 1 |
| Carbohydrate metabolism and regulation | Theoretical | 2 |
| Lipid metabolism | Theoretical | 2 |
| Amino acid and protein metabolism | Theoretical | 2 |
| Integration of metabolism: biochemical response in fasting and satiety | Theoretical | 1 |
| Micronutrients: Minerals | Theoretical | 1 |
| Metabolism of inorganic compounds | Theoretical | 2 |
| Detoxification mechanisms | Theoretical | 2 |
| Metabolism and acid-base balance | Theoretical | 2 |
| Metabolism of vitamins | Theoretical | 2 |
| Blood glucose analysis | Practical | 2 |
| **HISTOLOGY and EMBRYOLOGY** | | |
| **Topic** | **Type** | **Time** |
| Introduction to the histology of digestive system | Theoretical | 1 |
| Histology of oral organs and structures | Theoretical | 2 |
| Histology of digestive tract | Theoretical | 4 |
| Histology of liver | Theoretical | 2 |
| Histology of gallbladder and pancreas | Theoretical | 1 |
| Development of digestive system | Theoretical | 4 |
| Practice: Histology of oral organs and structures | Practical | 2 |
| Practice: Histology of digestive tract | Practical | 2 |
| Practice: Histology of liver, gallbladder, and pancreas | Practical | 2 |
| **MEDICAL MICROBIOLOGY** | | |
| **Topic** | **Type** | **Time** |
| Enterobacterales | Theoretical | 3 |
| Oxidase positive curved bacilli (Vibrionaceae, Campylobacteraceae) | Theoretical | 1 |
| Primary hepatotropic viruses (HAV, HBV, HCV, HDV and HEV) | Theoretical | 2 |
| Introduction to general parasitology | Theoretical | 1 |
| Protozoa | Theoretical | 4 |
| Nematodes | Theoretical | 2 |
| Cestodes | Theoretical | 2 |
| Trematodes | Theoretical | 2 |
| Normal flora | Theoretical | 1 |
| Bacterial pathogenesis | Theoretical | 2 |
| Lab: Examination of parasites | Practical | 2 |

**UROGENITAL AND ENDOCRINE SYSTEMS COMMITTEE**

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSES** | **THEORETICAL COURSE DURATION (h)** | **PRACTICAL**  **COURSE DURATION (h)** | **TOTAL**  **COURSE DURATION (h)** |
| *21020004-01* Introduction to Committee | 1 | 0 | 1 |
| *21020004-02* Anatomy | 13 | 4 | 17 |
| *21020004-03* Physiology | 32 | 0 | 32 |
| *21020004-04* Histology and Embryology | 16 | 8 | 24 |
| *21020004-05* Medical Biochemistry | 14 | 2 | 16 |
| **TOTAL** | **76** | **14** | **90** |

**AIMS AND LEARNING OBJECTIVES OF THE COMMITTEE**

**Aim:**

The aim of the committee is to ensure that the urogenital and endocrine systems are learned with a holistic approach in terms of anatomical, developmental, histological, physiological, and biochemical, and to have the knowledge and skill levels to understand the clinical lessons about these systems.

**Learning Objectives:**

**1.** Explains the structural features of the urogenital and endocrine systems.

**2.** Describes the biochemistry of the hormones, biomolecules, and their mechanisms of action.

**3.** Explains the physiological effects of the hormones and functioning of the urogenital system.

**4.** Explains how the organs in this system emerge in the developmental process and the distinguishing features at the tissue level.

**TOPICS**

|  |  |  |
| --- | --- | --- |
| **ANATOMY** | | |
| **Topic** | **Type** | **Time** |
| Kidney and ureter | Theoretical | 2 |
| Urinary bladder and urethra | Theoretical | 2 |
| Pelvic diaphragm and perineum | Theoretical | 2 |
| Male genital organs | Theoretical | 2 |
| Female genital organs and breast anatomy | Theoretical | 2 |
| Thyroid and parathyroid glands, suprarenal glands | Theoretical | 1 |
| Pituitary gland and pineal gland | Theoretical | 2 |
| Lab: Kidney, ureter, urinary bladder, and urethra | Practical | 2 |
| Lab: Pelvic diaphragm and perineum, male and female genital organs, endocrine glands | Practical | 2 |
| **PHYSIOLOGY** | | |
| **Topic** | **Type** | **Time** |
| Introduction to the physiology of the urogenital system | Theoretical | 2 |
| Glomerular filtration | Theoretical | 2 |
| Tubular reabsorption | Theoretical | 2 |
| Renal clearance | Theoretical | 1 |
| Sodium balance and regulation of extracellular fluid volume | Theoretical | 2 |
| Potassium balance | Theoretical | 1 |
| Calcium and phosphate balance | Theoretical | 1 |
| Acid-base balance | Theoretical | 2 |
| Physiology of male reproductive system | Theoretical | 2 |
| Physiology of female reproductive system | Theoretical | 2 |
| Physiology of pregnancy and lactation | Theoretical | 2 |
| Introduction to the endocrine system | Theoretical | 1 |
| Hypothalamus – pituitary functional relationship | Theoretical | 1 |
| Physiology of pituitary hormones | Theoretical | 1 |
| Growth Hormone | Theoretical | 2 |
| Physiology of thyroid hormones | Theoretical | 2 |
| Physiology of parathyroid hormones | Theoretical | 2 |
| Physiology of adrenocortical hormones | Theoretical | 2 |
| Endocrine functions of the pancreas | Theoretical | 2 |
| **MEDICAL BIOCHEMISTRY** | | |
| **Topic** | **Type** | **Time** |
| Kidney functions and electrolyte balance | Theoretical | 2 |
| Hormones and their properties | Theoretical | 2 |
| Mechanisms of action of hormones | Theoretical | 2 |
| Hypothalamus, pituitary, and pineal hormones | Theoretical | 2 |
| Thyroid gland hormones and metabolism | Theoretical | 2 |
| Metabolism of adrenal cortex hormones | Theoretical | 2 |
| Biochemistry of the adrenal medulla | Theoretical | 2 |
| Lab: Complete Urine Analysis | Practical | 2 |
| **HISTOLOGY and EMBRYOLOGY** | | |
| **Topic** | **Type** | **Time** |
| Histology of kidneys and urinary tracts | Theoretical | 2 |
| Development of urinary system | Theoretical | 2 |
| Histology of male genital system | Theoretical | 2 |
| Histology of female genital system | Theoretical | 2 |
| Development of genital system | Theoretical | 3 |
| Development and histology of hypophysis and epiphysis | Theoretical | 2 |
| Development and histology of thyroid, parathyroid, adrenal glands, and endocrine pancreas | Theoretical | 3 |
| Practice: Histology of urinary system | Practical | 2 |
| Practice: Histology of male genital system | Practical | 2 |
| Practice: Histology of female genital system | Practical | 2 |
| Practice: Histology of endocrine system | Practical | 2 |

**BASICS OF DISEASES COMMITTEE**

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSES** | **THEORETICAL COURSE DURATION (h)** | **PRACTICAL**  **COURSE DURATION (h)** | **TOTAL**  **COURSE DURATION (h)** |
| *21020005-01* Introduction to Committee | 1 | 0 | 1 |
| *21020005-02* Biophysics | 4 | 0 | 4 |
| *21020005-03* Medical Biochemistry | 4 | 0 | 4 |
| *21020005-04* Medical Biology | 8 | 0 | 8 |
| *21020005-05* Medical Pharmacology | 23 | 0 | 23 |
| *21020005-06* Medical Microbiology | 28 | 10 | 38 |
| *21020005-07* Medical Pathology | 19 | 0 | 19 |
| **TOTAL** | **87** | **10** | **97** |

**AIMS AND LEARNING OBJECTIVES OF THE COMMITTEE**

**Aim:**

The aim of this committee is to explain the basic biochemical, molecular, pharmacological, microbiological, and pathological information for clinical and laboratory evaluations of diseases and to provide the knowledge and skill levels necessary to understand the clinical courses planned for the next medical education stages.

**Learning Objectives:**

**1.** Explains the biophysical changes associated with the disease.

**2.** Explains the biochemical changes that occur in diseases.

**3.** Explains the information about the disease-causing microbiological organisms.

**5.** Explains the mechanism of action of drugs.

**6.** Explains disease-related pathological concepts.

**7.** Explains the molecular biological basis of diseases.

**TOPICS**

|  |  |  |
| --- | --- | --- |
| **BIOPHYSICS** | | |
| **Topic** | **Type** | **Time** |
| Electric current, biological effects and safety | Theoretical | 1 |
| Bioelectric applications | Theoretical | 1 |
| Description of radiation, its main features | Theoretical | 1 |
| Biological effects of radiation | Theoretical | 1 |
| **BIOCHEMISTRY** | | |
| **Topic** | **Type** | **Time** |
| Reactive oxygen molecules and oxidative stress | Theoretical | 2 |
| Plasma proteins and acute phase response | Theoretical | 2 |
| **MEDICAL MICROBIOLOGY** | | |
| **Topic** | **Type** | **Time** |
| Collection and transport of microbiological samples | Theoretical | 2 |
| Gram-positive cocci (staphylococcus) | Theoretical | 1 |
| Gram-positive cocci (streptococci) | Theoretical | 2 |
| Gram-positive spore-forming bacilli (Bacillus, Clostridium) and gram-positive non-spore-forming bacilli (Actinomyces, Nocardia, Tropheryma, Rhodococcus, Corynebacterium, Listeria) | Theoretical | 3 |
| Gram-negative diplococci (Neisseria, Moraxella) | Theoretical | 1 |
| Gram-negative coccobacilli (Haemophilus, Pasteurella, Brucella, Bordetella, Francisella) | Theoretical | 2 |
| Non-fermentative gram (-) bacilli (Pseudomonas, Burkholderia,  Stenotrophomonas, Acinetobacter) and various gram (-) bacilli (Eikenella, Bartonella, Klebsiella granulomatis, Gardnerella, Legionella) | Theoretical | 2 |
| Spirochete, rickettsia, chlamydias, mycoplasmas and other anaerobic bacteria | Theoretical | 2 |
| Introduction to general virology | Theoretical | 1 |
| DNA viruses (herpesviruses, poxviruses, papovaviruses, adenovirus and  parvovirus) | Theoretical | 3 |
| Negative-sense RNA viruses (myxoviruses, bunyaviruses, rabies virus,  filoviruses and lymphocytic choriomeningitis virus) | Theoretical | 3 |
| Positive-sense RNA viruses (picornaviruses, norovirus, rotavirus, coronavirus, rubella virus and flaviviruses) | Theoretical | 2 |
| General mycology, superficial and cutaneous mycosis agents, subcutaneous mycosis agents | Theoretical | 2 |
| Endemic and opportunistic agents of mycosis | Theoretical | 2 |
| Lab: Diagnostic methods of Gram-positive bacteria | Practical | 2 |
| Lab: Diagnostic methods of Gram-negative bacteria | Practical | 2 |
| Lab: Methods of diagnosis of bacteria with different characteristics | Practical | 2 |
| Lab: Examination of fungi | Practical | 2 |
| Lab: Bacteriological identification methods | Practical | 2 |
| **MEDICAL BIOLOGY** | **Type** | **Time** |
| Heredity models | Theoretical | 1 |
| Molecular biology of cancer | Theoretical | 2 |
| Structure of telomerase and its connection with aging and cancer | Theoretical | 1 |
| Population genetics | Theoretical | 1 |
| Gene mapping | Theoretical | 1 |
| Genetic polymorphism | Theoretical | 1 |
| Genotoxicity | Theoretical | 1 |
| **MEDICAL PHARMACOLOGY** | **Type** | **Time** |
| Introduction to pharmacology | Theoretical | 1 |
| Pharmaceutical types of drugs | Theoretical | 1 |
| Administration routes of drugs | Theoretical | 1 |
| Mechanisms of action, pharmacodynamics | Theoretical | 1 |
| Pharmacokinetics: absorption, distribution, biotransfomation and elimination | Theoretical | 4 |
| Drug receptors and pharmacodynamic effects | Theoretical | 1 |
| The relationship of dose (concentration) – pharmacological effect | Theoretical | 2 |
| The factors changing the effects of drugs | Theoretical | 2 |
| Pharmacokinetic and pharmacodynamic drug interactions | Theoretical | 2 |
| The unwanted and toxic effects of drugs | Theoretical | 1 |
| Pharmacology of autacoids and gaseous autacoids: EDRF, EDHF, NO | Theoretical | 1 |
| Autacoids with amine structure: 5-hydroxytryptamine (serotonin), histamine | Theoretical | 2 |
| Autacoids with peptide structure: Angiotensins, quinines, endothelins | Theoretical | 2 |
| Autacoids with lipid structure: Eicosanoids, PAF | Theoretical | 2 |
| **MEDICAL PATHOLOGY** | **Type** | **Time** |
| Introduction to pathology, definitions, and techniques | Theoretical | 2 |
| Causes, mechanism, and morphologic alterations of cell injury | Theoretical | 2 |
| Cellular adaptation, intracellular accumulation, and cellular aging | Theoretical | 2 |
| Necrosis and apoptosis | Theoretical | 2 |
| Inflammation and repair | Theoretical | 4 |
| Mechanical trauma injury / thermal, electrical, and ionized radiation injury | Theoretical | 1 |
| Hemodynamic disturbances | Theoretical | 2 |
| Introduction to autoimmune diseases and hypersensitivity reactions | Theoretical | 2 |
| General principles of infection pathology | Theoretical | 1 |
| Amyloidosis | Theoretical | 1 |

**SCIENTIFIC AND CLINICAL APPROACHES COMMITTEE**

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSES** | **THEORETICAL**  **COURSE DURATION (h)** | **PRACTICAL**  **COURSE DURATION (h)** | **TOTAL**  **COURSE DURATION (h)** |
| *21020006-01* Scientific Research Methods and Biostatistics | 21 | 4 | 25 |
| *21020006-02* Clinical Overview II | 56 | 0 | 56 |
| *21020006-03* Clinical Skill II | 0 | 10 | 10 |
| **TOTAL** | **77** | **14** | **91** |

**AIMS AND LEARNING OBJECTIVES OF THE COMMITTEE**

**Aim:**

The aim of this committee is to gain basic medical skills, scientific and clinical approach skills, and awareness of medicine, and to develop evidence-based analytical skills.

**Learning Objectives:**

**1.** Learns the basic professional skill techniques required in clinical practice.

**2.** Describes the techniques applied in basic life support, respectively.

**3.** Defines how to make wound dressing.

**4.** Determines the fracture with the correct technique.

**5.** Learns to wear cervical collar with correct technique.

**6.** Learns the technique of applying elastic bandage in traumatic patients.

**7.** Learns the patient positions and technique for the blood pressure measurement.

**8.** Learns the techniques of measuring fever and counting respiratory rate.

**9.** Explains how to control bleeding in patients with arterial and venous bleeding.

**10.** Explains the technique of measuring blood glucose with a glucometer, respectively.

**11.** Explains how to give an intravenous (IV) injection to a patient.

**12.** Lists the techniques of hand washing and wearing gloves.

**13.** Describes organ systems in connection with relevant clinical information.

**14.** Explains the disease and clinical picture.

**15.** Defines the sources of access to information.

**16.** Learns to prepare scientific research in accordance with research principles.

**17.** Learns to design research and calculates the sample width.

**18.** Learns to enter the research data into computer and to evaluate research findings by applying biostatistical analysis techniques.

**TOPICS**

|  |  |  |
| --- | --- | --- |
| **SCIENTIFIC RESEARCH METHODS AND BIOSTATISTICS** | | |
| **Topic** | **Type** | **Time** |
| Purpose and research methods of scientific research | Theoretical | 1 |
| Preparing a scientific project in health sciences: Preparing for the project writing and planning the project | Theoretical | 1 |
| Creation of the project team, determination of the project method, necessary permissions for the project | Theoretical | 1 |
| Writing the project proposal | Theoretical | 1 |
| Mistakes made in the project proposal and solution suggestions | Theoretical | 1 |
| Biostatistics, data, and variable concepts | Theoretical | 1 |
| Descriptive statistics | Theoretical | 1 |
| Prevalence measures | Theoretical | 2 |
| Frequency tables | Theoretical | 1 |
| Table and graphical representations | Theoretical | 1 |
| Practices | Practical | 2 |
| Hypothesis testing | Theoretical | 2 |
| Statistical testing methods and sample size | Theoretical | 2 |
| More than two samples’ tests in independent groups | Theoretical | 2 |
| Multiple sample tests and categorical data analysis in dependent groups | Theoretical | 2 |
| Diagnostic tests and ROC analysis | Theoretical | 2 |
| Practices | Practical | 2 |
| **CLINICAL OVERVIEW II** | | |
| **Topic** | **Type** | **Time** |
| Spinal cord lesions | Theoretical | 1 |
| Lesions of the brain stem and cerebellum | Theoretical | 2 |
| Cranial nerves: I-VI lesions | Theoretical | 1 |
| Cranial nerves: VII-XII lesions | Theoretical | 1 |
| Developmental anomalies of nervous system | Theoretical | 1 |
| Cerebral hemisphere lesions, subcortical lesions, and vascular lesions | Theoretical | 2 |
| Clinical anatomy of eyeball and accessory ocular structures | Theoretical | 1 |
| Visual tract lesions | Theoretical | 1 |
| Hearing and balance: clinical anatomy | Theoretical | 1 |
| Developmental anomalies of eye globes-lids and ears | Theoretical | 1 |
| Serological tests | Theoretical | 2 |
| Clinical anatomy of the cardiovascular system | Theoretical | 1 |
| Developmental anomalies of heart and vessels | Theoretical | 2 |
| Clinical anatomy of the respiratory system | Theoretical | 1 |
| Clinical enzymology | Theoretical | 1 |
| Developmental anomalies of urogenital system | Theoretical | 2 |
| Clinical anatomy of the urogenital system | Theoretical | 2 |
| Biochemical approach to kidney diseases | Theoretical | 1 |
| Biochemical approach to diseases of the hypothalamic-pituitary system | Theoretical | 1 |
| Biochemical approach to thyroid gland diseases | Theoretical | 1 |
| Clinical anatomy of the endocrine system | Theoretical | 1 |
| Biochemical approach to adrenal gland diseases | Theoretical | 2 |
| Abdominal wall hernias | Theoretical | 1 |
| Clinical anatomy of the digestive system | Theoretical | 2 |
| Developmental anomalies of digestive system | Theoretical | 2 |
| Lipid metabolism disorders | Theoretical | 1 |
| Integration of metabolism: biochemical response in fasting and satiety (case report) | Theoretical | 1 |
| Clinical evaluation of the metabolism of vitamins | Theoretical | 1 |
| Inherited metabolic diseases | Theoretical | 2 |
| Clinical drug research, bioavailability, and bioequivalence studies | Theoretical | 2 |
| Clinical significance of oxidative phosphorylation and energy homeostasis | Theoretical | 1 |
| Chromosomal aberrations | Theoretical | 1 |
| Molecular basis of inherited diseases | Theoretical | 1 |
| Cancer biochemistry | Theoretical | 2 |
| Tumor immunology | Theoretical | 1 |
| Gene defects | Theoretical | 2 |
| Pharmacogenetics and its applications | Theoretical | 1 |
| Molecular diagnostic methods | Theoretical | 1 |
| Medically important arthropods and their diseases | Theoretical | 1 |
| Transplantation pathology | Theoretical | 1 |
| Transplantation immunology | Theoretical | 1 |
| Pharmacovigilance | Theoretical | 1 |
| Rational drug use | Theoretical | 1 |
| **CLINICAL SKILLS** | | |
| **Topic** | **Type** | **Time** |
| Wound dressing skills | Practical | 2 |
| Ability to apply elastic bandages | Practical | 2 |
| Blood pressure measurement skills | Practical | 2 |
| Bleeding control | Practical | 2 |
| Ability to give intramuscular (IM) and subcutaneous (SC) injections | Practical | 2 |