ÜSKÜDAR UNIVERSITY SHMYO MEDICAL LABORATORY TECHNIQUES PROGRAM 2024-2025 COURSE CONTENTS

I. SEMESTER

MYO101 Basic Anatomy and Physiology (3 + 0 + 3) ECTS: 4

Introduction to anatomy and physiology and brief terminology, Axes, planes, terms indicating location and direction; general information. Cell Theory, Structural properties, Cell organelles, Cell division; Substance exchange, Metabolism. Anatomy and Physiology of Locomotor System- Osteology. Locomotor System; Arthrology; General information, joint types, movements. Myology; Anatomy, Contraction mechanism, Striated muscles, heart muscle, smooth muscles physiology. Anatomy and Physiology of respiratory system. Nose, paranasal sinuses, larynx, trachea, lungs. Physiology of respiration, ventilation, diffusion, perfusion, respiratory regulation. Anatomy and physiology of the cardiovascular system. Blood: functions, components, shaped elements of blood, blood groups. Metabolism of the heart, heart sounds. Heart cavities, vessels. Anatomy and Physiology of Digestive System I. Anatomy of the mouth, Chewing muscles, Pharynx, Oesophagus, Stomach, Small and large intestines, Kc. Gall bladder, Pancreas, Digestive glands. Digestive System II. Digestion in the mouth, stomach, digestion in the small and large intestines. K.C. functions, CHO digestion, Fat-protein digestion. Vitamin-Mineral-Electrolyte functions. Anatomy and Physiology of Urinary System. Function of kidneys, nephron, urine formation, fluid-electrolyte balance. Distribution of water in the organism, Electrolytes- excess-base balance. Renin-angiotensin system. Genital organs-reproductive physiology. Female and male genital organs. Hormonal control of the reproductive system, hypothalamus, pituitary, gonodotropic hormones. Ovary hormones, reproductive cycle. Endocrine system anatomy and physiology. Glands of internal secretion, their functions. Physiological functions of hormones, classification. Hormones and target cells. Anatomy and physiology of nervous system. Development of nervous tissue, neuron, neuron types, functions, synapse, neuroglia cells. SSS and PSS. Sensory organs, Anatomy and Physiology. Visual pathways, hearing and balance pathways.

LBT113 Laboratory Safety (BSEÇ) (2 + 0 + 2) ECTS: 3

Introduction to laboratory safety. Principles of Safe Working in Laboratory and Laboratory. Laboratory Accidents and First Aid. Personal Protective Equipment. Waste Management. Safety Precautions Against Chemical Substances. Safety Precautions Against Biological Substances. Disinfection and Disinfectants. Sterilization. Sterilization applications and types, Antisepsis applications.

MAT101 Basic Mathematics (2 + 0 + 2) ECTS: 3

Numbers; Classification of numbers. Exponential Numbers. Rooted Numbers. Absolute Value. Factorization. Ratio Proportion. Problems and sample question solution. Equations, 1st Order Equations with 1 Unknown. 1st Order Equations with 2 Unknowns. 2nd Order Equations with 1 Unknown. Inequalities. Functions. Graphic Function, Composite Function, Four Operations in Functions. Sets.

TLT107 General Pathology (2 + 0 + 2) ECTS: 4

Introduction to Pathology, Tissues, Follow-up of Tissues, Staining Methods, Cell Damage and Adaptation, Cell Death, Cell Death, Inflammation and wound healing, Acute and Chronic Inflammation, General pathological features of infectious diseases, Tissue regeneration and repair, Nomenclature of tumors, Properties of tumors, Neoplasia and its properties.

RPSI209 Positive Psychology and Communication Skills (ÜSEÇ) (2 + 0 + 2) ECTS: 3

Definition of Positive Psychology and Basic Concepts. Theoretical Foundations of Positive Psychology. Introduction to Social Cognitive Neuroscience-Brain Infrastructure of Social Behavior. Positive Psychology Applications-Emotional Intelligence-Emotional Intelligence in Adults, Children and Youth, Marriage and Business Life. Self-Knowledge and Awareness. Recognizing Others and Empathy. Communication Skills. Motivation and Planning. Problem Solving Skills. Anger, Aggression and Violence. Relationship Management. Persistence. Healthy Decision Making. Compromise.

TLT109 Diseases Knowledge (BSEÇ) (2 + 0 + 2) ECTS: 3

Basic Health and Disease Concepts. Disease Abbreviations. Digestive System Diseases. Respiratory System Diseases-1. Respiratory System Diseases-2. Nervous System Diseases-1. Nervous System Diseases-2. Movement System and Skin Diseases. Circulatory System Diseases-1. Circulatory System Diseases-2. Excretory System Diseases-1. Excretory System Diseases-2. Endocrine System Diseases. Urogenital System Diseases. Sense Organs Diseases.

RKUL103 University Culture I (0 + 2 + 1) ECTS: 4

It enables the student to realize the privilege of being a “university student” throughout his/her university life, to comprehend that the university is not just a place of lectures and a place of gaining a profession, that in university life, he/she should understand and interpret what is happening in the world and around him/her, and that he/she should be a participant and a guide rather than a follower.

ATA103 Atatürk's Principles and History of Turkish Revolution I (2 + 0 + 2) ECTS: 2

Concepts, definitions, course methods and description of resources. Industrial Revolution and French Revolution. Disintegration of the Ottoman Empire (XIX. Century). Tanzimat and Reform Edict, I. and II. Constitutional Monarchy. World War I, Tripoli and Balkan Wars. Armistice Treaty of Mondros, Wilson Principles, Paris Conference. M. Kemal's landing in Samsun and the situation in Anatolia. Amasya Circular, National Congresses, Opening of the Parliamentary Assembly. Establishment of the Grand National Assembly of Turkey and Internal Revolts. Law on the Constitutional Organization, Establishment of the Regular Army. I. II. İnönü, Kütahya-Eskişehir and Sakarya Battles and the Great Offensive. Treaties during the War of Independence. Lausanne Peace Treaty. Abolition of the Sultanate

TURK103 Turkish Language I (2 + 0 + 2) ECTS: 2

Oral presentation studies. What is language; world languages, the place and historical development of Turkish among them. Problems of Turkish today with current texts. Spelling of “de”, ‘ki’ and “mi” in the light of current texts. Problems related to the spelling of Turkish words based on compiled texts. Text analysis: Analysis of a scientific article. Applications related to spelling rules and punctuation marks. Text analysis: Analysis of a column. Expression disorders, language mistakes and applications. Turkish as a language of science with sample texts. Oral presentation studies.

INGU101 English I (2 + 0 + 2) ECTS: 2

Introductions, verb to be, subject pronouns. Demonstrative pronouns, countable/uncountable nouns, quantifiers. Simple present tense, adverbs of frequency. Object pronouns, possessive adjectives, have got/has got. -Should, must (must/mustn't), can, can't (can/can't). Past tense (Simple Past Tense). Unit review (Units 1-7). Present tense. Conjunctions (and-but-therefore-because). Comparisons. Unit review (Units 9-11).

II. SEMESTER

BIK101 Biochemistry (2 + 0 + 2) ECTS: 2

The subject of biochemistry, biomolecules and cell. The subject of biochemistry, biomolecules and cell structure. Properties of water and aqueous solutions. Amino acids, peptides and proteins. Proteins. Enzymes. Enzyme inhibition and regulation of enzyme activity. Carbohydrates. Lipids. Nucleic acids. Vitamins.

TBG103 Medical Biology and Genetics (2 + 0 + 2) ECTS: 4

Introduction to Medical Biology and Genetics. Biomolecules. Structure, organelles and functions of the cell. Cell metabolism. Structure of Genetic Material (Nucleic acids, DNA and RNA structure). Cell Division. Replication. Transcription. Genetic Code and Translation. Genetic Code and Translation. Inherited diseases (single gene diseases and chromosomal diseases). Inherited diseases (multifactorial diseases). Gene Engineering, Biotechnology and recombinant DNA technology.

MIK101 Basic Microbiology (2 + 0 + 2) ECTS: 2

Introduction to Medical Microbiology. Medical Bacteriology and Morphological Characteristics of Bacteria. Bacterial Metabolism and Reproduction. Bacterial Genetics. Bacterial Virulence Factors. Antimicrobial Agents. Medical Bacteriology. Medical Virology. Medical Parasitology. medical Mycology. Relationships between Microorganisms and Microorganism-Human Relationship. Sterilization, Disinfection and Antisepsis. Basic Immunology. General Principles of Laboratory Diagnosis.

TLT110 Laboratory Instruments (BSEC) (2 + 0 + 2) ECTS: 5

Laboratory safety and issues to be considered in laboratory work. Glass and plastic materials in the laboratory. Centrifugation Principle, types, centrifuges and maintenance. Microscope types, use and maintenance. Distilled Water and Types. pH Meter and its use. Basic Principle and Use of Spectrophotometer. Biochemistry Autoanalyzer. Chromatographic analysis methods. Complete Blood Count. PCR (Polymerase Chain Reaction). Real Time PCR

TLT100 Introduction to Hematology (2 + 0 + 2) ECTS: 4

Introduction to Hematology, Hematopoiesis. General Structure of Blood, Composition, Properties, Serum-Plasma and Anticoagulants. Blood Count, Erythrocytes (Erythrocyte metabolism, Development, Properties, Counting, Different Types. Hemoglobin (Structure, Determination, Differences, Properties), Hematocrit, Sedimentation Rate. Anemias (Causes, Classification), Other Diseases Related to Erythrocytes. Leukocytes (Characteristics, Development, Counting, Subtypes and Leukocyte Parameters). Leukocyte Abnormalities, Related Diseases. Platelets (Properties, Development, Counting), Coagulation Mechanisms, Tests. Diseases Related to Platelets and Coagulation Mechanism. Serologic Tests in Hematology, Blood Groups and Determination, Rh subgroups. Collection of Blood Samples. Bone Marrow Aspiration. Blood Banking (Products, Applications), Donor Selection, Transfusion, Apheresis, Crossmatch and Coombs tests.

GKM101 General Chemistry (2+0+2) ECTS:3

Measurement, Unit Systems, Basic Laws of Chemistry. Matter and physical, chemical properties. Compounds, Elements, Molecules. Chemical compounds and calculations based on chemical reactions. Mole Concept, Finding Chemical Formulas and Redox Reactions. Atom and atomic structure. Bohr Atomic Theory, Modern atomic theory, Periodic Table, Quantum Numbers. Chemical Bonds, Formal Charge, Polarity of Bond. Acid-Base Concept. Acid-Base Reactions and titration. Solutions and concentration. Molarity, Normality, Molality, Mass and Volume percentage calculations. Buffer Solutions, pH, equilibrium constants, chemical equilibrium. Calorie Calculation in Foods (Carbohydrate, Protein, Fat)

RKUL104 University Culture II (ÜSEC) (0 + 2 + 1) ECTS: 4

It enables the student to realize the privilege of being a “university student” throughout his/her university life, to comprehend that the university is not just a place of lectures and a place of gaining a profession, that in university life, he/she should understand and interpret what is happening in the world and around him/her, and that he/she should be a participant and a guide rather than a follower.

ATA104 Atatürk's Principles and History of Turkish Revolution II (2 + 0 + 2) ECTS: 2

Lausanne Peace Treaty and its Evaluation. Political Revolutions, Proclamation of the Republic and Abolition of the Caliphate. Attempts to Transition to Multi-Party Political Life. Revolutions in the Field of Law. Revolutions in the Social Field. Revolutions in Education and Economy. Turkish Foreign Policy between 1923-1938. Turkish Foreign Policy between 1938-1950. Democrat Party Government and Adnan Menderes Period (1950 - 1960). 1960 Government Coup and Political Developments Afterwards. Domestic Politics of Turkey in the 1980-2002 Period. Basic Principles of Turkish Revolution (Atatürk's Principles and Complementary Principles). Atatürk's Revolutions, Rationalism and Scientific Thought; Republicanism and Populism. Nationalism and Statism; Secularism and Revolutionism.

TURK104 Turkish Language II (2 + 0 + 2) ECTS: 2

Oral presentation studies. What is language; world languages, the place and historical development of Turkish among them. Problems of Turkish today in the light of current texts. Spelling of "de", 'ki' and "mi" in the light of current texts. Problems related to the spelling of Turkish words based on compiled texts. Text analysis: Analysis of a scientific article. Applications related to spelling rules and punctuation marks. Text analysis: Analysis of a column. Expression disorders, language mistakes and applications. Turkish as a language of science with sample texts. Oral presentation studies.

INGU104 English II (2 + 0 + 2) ECTS: 2

Demonstrative Pronouns, Possessive Pronouns. Past Continuous Tense. Okuma ve kelime alıştırması (Simple Past Tense&Past Continuous Tense). Preposition of Time and Place. Present Perfect Tense. Possessive"s",Adverbs of manner. Future Tense. Making Suggestions&Requests. Gerunds – Infinitives. Modals (must,should,have to,don't have to,may).

III. SEMESTER

TLT231 Clinical Biochemistry (3 + 2 + 4) ECTS: 8

Introduction to clinical biochemistry and laboratory work; Collection of samples and procedures. The importance of enzymes in clinical diagnosis (Application: Solution preparation and Buffer Solution, Micropipette Types and Usage). The importance of enzymes in clinical diagnosis (Practice: Solution preparation and Buffer Solution, Micropipette Types and Usage). The importance of plasma proteins in clinical diagnosis (Application: Blood group determination). Plasma lipids and atherosclerosis (Application: Blood glucose measurement). Carbohydrate metabolism disorders (Application: Filebotomy). Carbohydrate metabolism disorders (Application: Filebotomy). Renal function tests (Application: Filebotomy). Urine Microscopy (Application: Filebotomy). Endocrinology (Application: Hemogram Device). Minerals and Bone Metabolism Disorders (Application: Spectrophotometer Device). Importance of Tumor Markers in Clinical Diagnosis (Application: Biochemistry Autoanalyzer). Cerebrospinal fluid (CSF) Biochemistry (Application: Complete Urinalysis).

TLT223 Basic Laboratory Applications I (0 + 8 + 4) ECTS: 10

Patient registration, Sample collection rules, Sample collection and processing, preanalytical errors, Blood count methods (manual), Blood count methods (automation), Urine analysis (manual and automation), protein and creatinine determinations, urine sediment analysis (microscopy), Biochemistry autoanalyzer studies, Turbidimetric methods (clot measurement etc.), Nephelometric measurements (Apo A and Apo B etc.), HPLC methods (HbA1c etc.), Radioimmunassay methods, Chemiluminescence methods (hormone analysis, drug levels analysis)

TLT225 Clinical Microbiology I (2 + 2 + 3) ECTS: 8

Introduction to Medical Bacteriology (Application-Microbiology Laboratory Rules). Gram (+) Cocci (Application- Parts and functions of the microscope). Gram (-) Cocci (Application-Microbiological Preparation). Gram (+) Bacilli (Application-Microbiological Staining Methods). Enteric Gram (-) Bacilli (Application- Simple Staining Method). Respiratory Gram (-) Bacilli (Application-Gram Staining Method). Animal Gram (-) bacilli (Application-Microbial Sources and Pure Culture Techniques). Anaerobic Bacteria Application- Aseptic Culture Transfers). Mycobacteria (Application- Biochemical Bacterial Identification Tests).

Spirochetes (Application- Antibiotic Susceptibility Test Disk Diffusion Method). Mycoplasma (Practice- Sample acceptance, collection and processing in microbiology laboratories). Chlamydia (Practice- Diagnostic technologies in clinical microbiology; manual and automated systems). Rickettsia (Practice- Diagnostic technologies in clinical microbiology; immunologic methods). Infectious Diseases (Practice-Student Presentations).

MET 201 Professional Ethics (2 + 0 + 2) ECTS: 2

What is Ethics / An Overview of Ethical Theories / Basic Concepts: Responsibility, Accountability and Obligation / Ethical Analysis. Society and Information Ethics: The Two-Way Relationship between Society and Technology The Impact of Information Technologies; Optimistic, Pessimistic, Contextualist Views Why Information Ethics? The Task of Information Ethics. Addiction, Health Problems, Unemployment, Social Relations. Security, Misuse and Cybercrimes. Human rights and Patient rights. Hospital ethics committees. Principles of medical professional ethics and deontology - presentation. Principles of medical professional ethics and deontology. Ethical case analysis - student presentation. Laboratory Ethics; Laboratory Definition, Types, Functions and Equipment, Good Laboratory Practices. Ethical practices on Laboratory Safety, Health of Laboratory Workers, Quality Assurance Practice and Accreditation of Laboratories. What is bioethics? The relationship between bioethics and ethics, History of the scope of bioethics. Genetic research and ethical dimension.

Elective Course (2 + 0 + 2) ECTS: 2

IV. SEMESTER

TLT212 Parasitology (BSEÇ) (2 + 2 + 3) ECTS: 5

Meeting and sharing of program objectives Receipt and evaluation of student expectations Sharing of assessment and evaluation methods and details Determination of homework groups and giving topics Determination and sharing of homework method Determination and sharing of homework method Determination and sharing of homework groups and giving topics Determination and sharing of homework method Determination and sharing of homework method Determination and sharing of homework method Determination and sharing of homework method Determination and sharing of homework method (Application: Laboratory Rules). Introduction to parasitology Parasitism and related concepts (Application-Parts and Function of Microscope). General characteristics and classification of parasites Important parasites in terms of public health in our country (Application-Microbiological Preparation). Structure and physiology of protozoa, amoebae in the human body (Application-Parasitological Staining Methods). Digestive system flagellates, urogenital system flagellates and their clinical importance (Application-Giemsa Staining Method). Blood and tissue flagellates and their clinical importance (Application-Precipitation Method). Apicomplexa Branch and its clinical importance (Application-Floating Method). Cilioaphora Branch and its clinical importance (Application-Sample Acceptance, Collection and Processing in Parasitology Laboratory). Digestive system nematodes and their clinical importance (Practice-Diagnostic Technologies in Parasitology; manual and automatic systems). Circulatory system nematodes and their clinical importance (Application-Microscope Examination). Trematodes and their clinical importance (Application-Microscope Examinations). Cestodes and their clinical importance (Practice-Preparation of Fresh Blood Preparations Thin Smear). Medically important arthropods (Application- Preparation of Fresh Blood Preparations, Thick Drops). Poisonous arthropods (Practice-Student Presentations).

ILK101 First Aid (2 + 0 + 2) ECTS: 3

To apply the basic principles of first aid. To learn about the human body. To evaluate the patient / injured and the scene. To provide basic life support. To apply first aid in respiratory obstruction. To apply first aid in bleeding, shock, injuries. To apply first aid in burns, frostbite and heat stroke. To apply first aid in consciousness disorders. To apply first aid in poisoning. To apply first aid in animal bites. To apply first aid in foreign body in the eye, ear, nose. To apply first aid in drowning. To apply first aid in fractures, dislocations and sprains. Carrying the sick and injured.

TLT214 Basic Laboratory Applications II (BSEÇ) (0 + 8 + 4) ECTS: 10

Patient registration, Sample collection rules, Sample collection and processing, preanalytical errors, Blood count methods (manual), Blood count methods (automation), Urine analysis (manual and automation), protein and creatinine determinations, urine sediment analysis (microscopy), Biochemistry autoanalyzer studies, Turbidimetric methods (clot measurement etc.), Nephelometric measurements (Apo A and Apo B etc.), HPLC methods (HbA1c etc.), Radioimmunassay methods, Chemiluminescence methods (hormone analysis, drug levels analysis)

TLT230 Clinical Microbiology II (2 + 2 + 3) ECTS: 8

Meeting and sharing of program objectives Receiving and evaluating student expectations and evaluation Sharing of assessment and evaluation methods and details Determination of homework groups and assignment of topics Determination and sharing of homework methods Requests and expectations of the lecturer from the students. Introduction to medical virology,

general characteristics and classification of viruses. Diagnostic methods in viral infections. General characteristics and laboratory diagnosis of Herpes simplex viruses, VZV, CMV, EBV. General characteristics and laboratory diagnosis of Papovaviruses, Adenoviruses, Parvoviruses, Poxviruses. General characteristics and laboratory diagnosis of respiratory syncytial viruses, parainfluenza viruses. General characteristics and laboratory diagnosis of measles, mumps, rubella infections. General characteristics and laboratory diagnosis of Rhinovirus, Coronaviruses. General characteristics and laboratory diagnosis of influenza viruses. General characteristics and laboratory diagnosis of hepatitis viruses. General characteristics of fungi, classification and clinical importance of fungi. Superficial fungal infections. Subcutaneous fungal infections. Dimorphic fungi and opportunistic mycoses.

TLT222 Basic Immunology (2 + 0 + 2) ECTS: 4

Introduction to Basic Immunology. Antigens and Properties. Structure of the Immune System. Inflammatory Response. Formation of Immune Response. Hypersensitivity Reactions. Active and Passive Immunity. Vaccines. Immunologic Methods Used in Routine Diagnosis.