



TECHNOLOGICAL EDUCATIONAL INSTITUTE OF THESSALY
DEPARTMENT OF MEDICAL LABORATORIES

Course description

Units & ECTS

Larissa, Greece

Sept 2017

PART A: Table of Units

SEMESTERS: 8

TOTAL UNITS: 41

TOTAL ECTS: 240

1st SEMESTER

CODE NUMBER	UNITS	TEACHING HOURS/ WEEK (13 WEEKS)			ECTS
		LECTURES	LABORATORY EXERCISE	TOTAL	
131	Medical Physics	3	2	5	6
132	Mathematics and Biostatistics	3	0	3	4
133	Introduction to Computers and Informatics	3	2	5	6
134	Chemistry	3	2	5	7
135	Biology	3	2	5	7

2nd SEMESTER

CODE NUMBER	UNITS	TEACHING HOURS/ WEEK (13 WEEKS)			ECTS
		LECTURES	LABORATORY EXERCISE	TOTAL	
231	Anatomy I	2	1	3	4
232	Physiology I	3	1	4	5
233	Biochemistry I	3	2	5	6
234	General Microbiology	3	2	5	6
235	Medical Informatics	3	2	5	5
236	Laboratory Safety - First Aid	2	1	3	4

3rd SEMESTER

CODE NUMBER	UNITS	TEACHING HOURS/ WEEK (13 WEEKS)			ECTS
		LECTURES	LABORATORY EXERCISE	TOTAL	
331	Anatomy II	2	1	3	4
332	Physiology II	2	1	3	4
333	Biochemistry II	3	2	5	6
334	General Histopathology	3	2	5	5
335	Medical Microbiology I	3	2	5	6
336	Laboratory Instruments Technology	3	2	5	4

Medical Laboratories Department – Unit description

4th SEMESTER

CODE NUMBER	UNITS	TEACHING HOURS/ WEEK (13 WEEKS)			ECTS
		LECTURES	LABORATORY EXERCISE	TOTAL	
431	Cytology	3	2	5	6
432	Health Psychology	3	0	3	3
433	Clinical Chemistry I	3	2	5	6
434	Haematology I	3	2	5	6
435	Clinical Microbiology	3	2	5	6
436	English Terminology	2	1	3	3

5th SEMESTER

CODE NUMBER	UNITS	TEACHING HOURS/ WEEK (13 WEEKS)			ECTS
		LECTURES	LABORATORY EXERCISE	TOTAL	
531	Special Histopathology	3	2	5	6
532	Blood Banks - Blood collection	3	2	5	5
533	Clinical Chemistry II	3	2	5	5
534	Haematology II	3	2	5	5
535	Virology	3	2	5	5
536	Research Methodology	3	1	4	4

6th SEMESTER

CODE NUMBER	UNITS	TEACHING HOURS/ WEEK (13 WEEKS)			ECTS
		LECTURES	LABORATORY EXERCISE	TOTAL	
631	Immunology	3	2	5	7
632	Clinical Chemistry III	3	2	5	7
633	Haematology III	3	2	5	6
634	Laboratory Quality Assurance	3	0	3	4
635	Biotechnology Applications in Medicine	3	2	5	6

Medical Laboratories Department – Unit description

7th SEMESTER

CODE NUMBER	UNITS	TEACHING HOURS/ WEEK (13 WEEKS)			ECTS
		LECTURES	LABORATORY EXERCISE	TOTAL	
731	Pharmacology - Toxicology	3	2	5	7
732	Mycology - Parasitology	3	2	5	7
733	Clinical Chemistry IV	3	2	5	7
734	Medical Professions Ethics & Labor Relations	2	0	2	4
735	Principles of Hygiene	3	2	5	5

8th SEMESTER

CODE NUMBER	UNITS	ECTS
2000	Thesis	20
3000	Practical Training	10

PART B: Brief Description of Units

1st SEMESTER

CODE NUMBER	UNIT	BRIEF DESCRIPTION
131	Medical Physics	Basic concepts of engineering (with typical laboratories: one-dimensional movement, momentum, strength and acceleration). Basic concepts of electromagnetism and electrical circuits (with typical laboratories: resistance measurement with ammeter and voltmeter, Joule's law, specific electron load measurement, electrolyte conductivity measurement). Basic concepts of optics (with typical laboratories: optical spectroscopy, laser features). Basic concepts of radioactive materials and ionizing radiation (with typical laboratories: Geiger-Muller I counter, Geiger-Muller II counter, radon count, Thoron life time measurement)
132	Mathematics and Biostatistics	Population, Sample, Frequency, Measure of the center of a set of observations, measurement of variability, data description (tables, diagrams). Probabilities, Trial, definition of probability, independence of events, Inverse probability, Total Probability Rule, Bayes Theorem Random Variable , Discrete random variables, Continuous random variables, Distributions of Random Variables, The binomial distribution, Poisson distribution, Exponential distribution, Normal distribution Estimation of intervals and parameters, Statistical Inference - Hypothesis Testing, Statistical inference- Interval Estimation.
133	Introduction to Computers and Informatics	The aim of this unit is to introduce students to the basic functions and technology of electronic computers. The theoretical part comprises an introduction to the basic computer hardware (central and peripheral memory, processor, storage devices, input/output devices) and software (operating system, applications) and to the internet communications. <i>Laboratories:</i> Students develop their skills in writing a scientific report and in processing numerical data using the MS Office programs.
134	Chemistry	Structure of the individual, periodic table of elements, chemical bond, complex compounds, intermolecular attracting forces, acids and bases, liquids, solids and gases, thermodynamics - thermochemistry, chemical reaction kinetics, photochemistry, solutions, oxidation - reduction, syntax, Nomenclature of organic compounds. Active groups. Stereochemistry, electronic theories, reactions and reagents, spectroscopic data, hydrocarbons, alkanes, cycloalkanes, alkenes, aldehydes, addition reactions, alkyl halides, inorganic esters, benzene chemistry and homologs. Polypyrene aromatic compounds, alcohols, ethers, amines, carbonyl compounds, carboxylic acids and derivatives, heterocyclic aromatic compounds, lipids, isoprenoids and sugars. <i>Laboratories:</i> Safety rules in the chemical laboratory, reagents and utensils. Preparation of solutions. Measurement of pH. Buffers. Introduction to chemical analysis, neutralization volumetry, ionic properties of amino acids. Spectrophotometry.
135	Biology	Introduction to the cell and its components. Chemical composition of the cell. Organization of prokaryotic and eukaryotic cells, viruses. Characteristics of animal cells (and differences with plant cells). Cell membrane structure and functions. Bioenergy systems - energy transformations into cells. The genetic material. Molecular genetics (doctrine of biology). Cell cycle - Cell division. Mitosis and Meiosis. Ways of heredity. Genetic mutations - chromosome abnormalities. Genetic machine. Search for information in biological databases. <i>Laboratories:</i> Microscopy and microscopic observation. Handling and microscopic observation of bacteria. The Fungi. The tissues of animal organisms. Karyotype, et al.

2nd SEMESTER

231	Anatomy I	<p>This unit will provide the students with an overview of the body from a systemic perspective. The students will be introduced to important anatomical terms and the basic concepts of human body construction, such as the composition, shape, size and position of the organs, as well as the topographical and functional relationship between them.</p> <p>The systems of the human body that will be studied in this unit are: respiratory, digestive, urinary, reproductive (male and female), endocrine and circulatory (heart and vessels).</p>
232	Physiology I	<p>Cell Physiology: Cell Structure, cell membranes and transport across cell membranes. Muscle cell physiology. Blood composition and blood functions. The Immune System. Cardiovascular Physiology: Circuitry of the Cardiovascular System –Cardiac Electrophysiology, Cardiac cycle, Cardiac output. Blood flow and blood pressure. Regulation of arterial pressure. Microcirculation and Lymph. Respiratory Physiology: Mechanics of breathing control of breathing. Lung volumes and capacities. Gas transport and exchange. Renal physiology - Renal blood flow and filtration. Body fluids and acid-base physiology.</p>
233	Biochemistry I	<p>The aim of this unit is to provide the necessary knowledge to understand the basic function of metabolism, as well as to approach and understand the methods of study and analysis of various biochemical phenomena.</p> <p>Biocomponents and biochemical factors. Generally about Proteins, Carbohydrates, Lipids, Nucleic Acids, Hormones, Vitamins. Carbohydrate metabolism. Metabolism of Proteins and Amino Acids. Nucleotide metabolism.</p> <p>Lipid metabolism. Coordination of Interstitial Metabolism and its Completion.</p> <p><i>Laboratories:</i> Organization and Equipment of Biochemical Laboratory. Biochemical laboratory methods. Buffer Solutions - pH Measurement. Titration, Principles of Spectrophotometry - Spectroscopy. Individual Absorption, Principles of Chromatography Principles of Electrophoresis, Phylometry, Nefelometry, and others. Chain Reaction of Polymerase, et al.</p>
234	General Microbiology	<p>Prokaryotic and eukaryotic cells, bacterial metabolism, bacterial genetics, type of laboratory equipment, the concept of sterility and disinfection, the culture media needed and culture techniques, the cultural and morphological characteristics of microorganisms and the bacterial staining techniques.</p> <p><i>Laboratories:</i> Use of laboratory equipment such steam sterilizer, Incubator, laminar flow, Centrifuges, Microscopes, Preservation of culture media, Culture techniques, Staining techniques, Dilution techniques, Bacteria count, Disinfection</p>
235	Medical Informatics	<p>The aim of this unit is to introduce students to the basic information technology applications on biomedical sciences.</p> <p>Introduction to the sequence (DNA and protein) databases, to inferring relationships among sequences, to phylogenetic analyses and to other areas such as medical imaging and digital health.</p> <p><i>Laboratories:</i> In the laboratory part, students develop their skills in programs (eg. BLAST) freely available in biomedical sites (PubMed, UniProt).</p>
236	Laboratory Safety - First Aid	<p>a) Laboratory Safety: The lectures are oriented for the laboratory safety and hazards. The first part refers to PPE (personal protective equipment), the biosafety levels, natural Hazards, biological Hazards, chemical Hazards, radioactive materials, hospital waste.</p> <p>b) First Aid: lecture and practice series.</p>

Medical Laboratories Department – Unit description

3rd SEMESTER

331	Anatomy II	This unit provides an overview of the body from a systemic perspective and an introduction to important anatomical terms and the basic concepts of human body construction, such as the composition, shape, size and position of the organs, as well as the topographical and functional relationship between them. This course enhances the knowledge of: nervous system, sense organs, reticuloendothelial system, osteology, connectivity of joints and muscles.
332	Physiology II	This unit provides a continuation of the comprehensive study of the physiology of the human body. Topics include: Neuromuscular system - Structure and function, Endocrine system - Glands and types of Hormones, Digestive System motility, digestion and absorption, Human Sense Organs and their functions and Reproductive systems as well as metabolism and thermoregulation. This course provides a sound basis in human physiology.
333	Biochemistry II	Instrumental Methods of Analysis in Biochemistry - Optical Analysis Methods - Chromatographic Analysis Methods - Electrophoresis - Electrochemical Analysis Methods - Mass Spectroscopy - Infrared Spectroscopy - Nuclear Magnetic Resonance Spectroscopy (NMR) - nephelometry - Turbidity - Fluorescence - immunoenzymatic techniques, proteins, carbohydrates, lipids, nucleic Acids, Hormones, Vitamins - Antioxidants, Biomaterials, Food - Food Quality - Water - Water Quality. <i>Laboratories:</i> Instrumental Methods of Analysis in Biochemistry as above. Laboratory analysis of carbohydrates, lipids and lipoproteins. Laboratory analysis of proteins, hormones, nucleic acids. Laboratory analysis of proteins and hormones. Laboratory analysis of vitamins and antioxidants. Biochemical role of trace elements in humans. Food - Food Catabolism and Metabolism - Food Quality - Water - Biochemical role of water.
334	General Histopathology	This unit provides an introduction to the cell, cell division, cell differentiation and basic life functions. Furthermore, major topic areas include the four basic body tissue types; the epithelial tissue, the connective tissue, the muscle tissue and the nervous tissue. Additionally, this unit introduces students to the areas of embryology, organogenesis and teratogenicity. <i>Laboratories:</i> Organization and operation of a pathological anatomy laboratory. Understanding of the safety rules. Preparation of materials, solutions and reagents. Histological technique and technical errors. Hematoxylin-eosin staining. Introduction to frozen tissue procedure. Study of histological sections, according to theory.
335	Medical Microbiology I	Bacteria structure, bacterial taxonomy, normal flora, bacterial infectious diseases and pathogenesis from Staphylococcus, Streptococcus, Enterococcus, Clostridium, Escherichia coli, Salmonella-Shigella, Klebsiella, Haemophilus, Proteus, Pseudomonas, Neisseria, Mycobacterium, Chlamydia, Rickettsia, Mycoplasma <i>Laboratories:</i> Lab safety. Gram stain. Ziehl Neelsen stain. Biochemical identification and microscopic observation of Staphylococcus, Streptococcus, Enterococcus, Clostridium, Escherichia coli, Salmonella-Shigella, Klebsiella, Haemophilus, Proteus, Pseudomonas, Neisseria, Mycobacterium, Chlamydia-Rickettsia. Disinfection and sterilization.
336	Laboratory Instruments Technology	Volumetry and gravimetric analysis. Principles and applications in clinical practice of Electrochemistry, Spectroscopy, Centrifugation, Potentiometry, Extraction, Chromatography. Kinetic methods of analysis. <i>Laboratories:</i> Ph-meter and related instruments carrying special electrodes for the measurement of various ions, electrolytes, etc. Microscopes of common and counter phase. Photometry of translucent environment. Photometers of ambient darkness, Fluorescent photometers. Atomic emission devices (flame photometry) and atomic absorption. Centrifuging and ultracentrifuge devices. Low voltage and high voltage electrification devices. Techniques: chromatographic analysis, column chromatography, thin layer, distribution and liquid chromatography

Medical Laboratories Department – Unit description

4th SEMESTER

431	Cytology	<p>The aim of this unit is to provide an understanding of the study of cells under microscope, in terms of structure, function and chemistry. Normal and abnormal microscopic texture of systems and organs that provide the ability for cytological assessment (digestive system, respiratory system, urogenic, skin, sense organs etc).</p> <p><i>Laboratories:</i> Organization and operation of a cytology laboratory. Understanding of the safety rules. Obtaining cytological material from various organs and systems (Digestive - Respiratory - Urogenic - Genital System, Body cavities, CSF, Skin etc). Preparation of materials, solutions and reagents. Cytological techniques (smear and fluid treatment, cell-block technique, liquid phase technique, Cellular centrifugation. FNA applications, etc) - technical errors. Pap test. Hormonal control of the <i>female</i> reproductive cycle. Microscopy of cytological smears.</p>
432	Health Psychology	<p>Theories and research on health and illness. The meaning of health and illness for the individual. Why a person is affected by a particular illness. Why does a person experience a disease at a specific time. Stress and health. Patient and health care relationships.</p>
433	Clinical Chemistry I	<p>Urinary System, Urine Formation, Urine Collection, Urine Physical Examination, Urine Testing, Microscopic Urine Screening, Urine Specific Examinations, Kidney Function Testing, Aminocourea, Osmoticity and Osmolality, Urinary Glucose, Other Urinary Examinations. The meaning and importance of the above in medical science.</p> <p><i>Laboratories:</i> Basic urine analyzes. General urine, microscopy urine test as well as quantitative and semi-quantitative testing of substances in them. Urine tests for renal function such as creatinine clearance, PSP, urine concentration, 24-hour album. Determinations of glucose, non-protein nitrogen of lipid proteins in urine.</p>
434	Haematology I	<p>The aim of the unit is to provide an understanding of hematopoiesis, blood composition and functions, and the laboratory methods used for the study of blood cellular components. Blood, blood composition and blood functions. Hemodynamics. Blood cells. Hematopoiesis, hematopoietic organs and haematopoietic factors. Physiology of red blood cells and hemoglobin. General blood test and erythrocyte markers. Red blood cell antigenic systems - blood types. Iron metabolism. Anemias. Iron deficiency anemia. Haemolytic anemias. Megaloblastic anemia.</p> <p><i>Laboratories:</i> Analysis of work flow in the hematology lab, Use of blood analyzer, RBC, WBC and PLT count, Hemoglobin determination and electrophoresis, Blood smear, Microscopy of blood preparations, ABO blood group system.</p>
435	Clinical Microbiology	<p>Collection, storage and processing a variety of biological sample such blood, urine, tissue, bronchoalveolar lavage, saliva, feaces, semen etc.</p> <p><i>Laboratories:</i> Lab safety. Collection, storage and processing a variety of biological sample. Specimen culture. Biochemical identification. Bacteria typing. Microscopic observation. Antibiotic resistance (Kirby Bauer, e-test, MIC). Disinfection and sterilization.</p>
436	English Terminology	<p>Aim of this unit is to help students enhance their general English language skills and improve their communication skills. Considering the specific needs of the paramedical staff, they will also develop specific vocabulary and expressions for English used in the medical sector. They will be given practice in reading skills so as to enable them to handle a variety of medical texts through which they will familiarize themselves with basic medical terms, their meaning as well as their pronunciation.</p>

Medical Laboratories Department – Unit description

5th SEMESTER

531	Special Histopathology	<p>This unit introduces students to the pathology of infectious, inflammatory and malignant tissues and organs, and to the microscopic examination of them, in order to observe the appearance of abnormal cells and tissues in detail. Normal and abnormal microscopic texture of the tissues of specific systems and organs (Digestive - Respiratory - Urogenic - Genital System, Cardiovascular System, Endocrine glands, Body cavities, Skin etc).</p> <p><i>Laboratories:</i> Special stains of histological specimens. Photography of microscopic histological preparations. Study of histological sections. Immunohistochemistry and immunohistochemistry techniques. Electron Microscopy, tissue preparation for electron microscopy and the process of staining for electron microscopy. Manufacture of glass knives and resin. Viewing electronic micrographs. In situ hybridization.</p>
532	Blood Banks - Blood collection	<p>Introduction to the blood banks and blood donation, the transmitted diseases of blood, and blood products, organ donation, laws about donors, Technical Requirements for blood and blood components, the organogram of blood banks, transplantations, blood transfusion .</p> <p><i>Laboratories:</i> Practice series, Blood groups, HIV, Syphilis, HTLV I-II, Hepatitis-B and C.</p>
533	Clinical Chemistry II	<p>The unit aims to make students able to perform the usual laboratory chemistry assays in the blood. Be aware of all modern scientific methods related to the performance of laboratory blood tests and evaluate the outcome of the examinations. Provide instructions to the students for their proper preparation and the correct sample collection for each exam. Be able to take and prepare to test the biological samples. To prepare all the necessary reagents and solutions.</p> <p>Carbohydrates. non-protein nitrogen, proteins, lipids, lipoproteins, chemical function control, nephric function control, etc.</p> <p><i>Laboratories:</i> Determination and result interpretation of glucose, urea, uric acid, albumin, total cholesterol, HDL-cholesterol, LDL-cholesterol, LDH, AST and ALT, γ-GT, creatinine etc.</p>
534	Haematology II	<p>The aim of the unit is to provide an understanding of the pathological conditions of the blood, and the laboratory methods used for the study of blood and its components. The unit includes the study of hemoglobins and their pathology, haemoglobinopathies, sickle cell anemia, B-Thalassemia, as well as white blood cell physiology and pathology including white cell disorders and leukemias.</p> <p><i>Laboratories:</i> Laboratory investigation of hemoglobinopathias and leukemias. Use of blood analyzer. Hemoglobin determination and electrophoresis. Blood and marrow swab. General and specific techniques for the diagnosis of leukemias. Microscopy of blood preparations. Interpretation of results.</p>
535	Virology	<p>This unit is dedicated to the study of viruses, including their structure, functions, taxonomy, viral infectious diseases and pathogenesis, epidemiology, laboratory investigation, antiviral drugs, vaccines and prevention.</p> <p><i>Laboratories:</i> Collection, storage and processing a variety of biological sample. Cell culture techniques. Observation with reverse microscope. Thawing cells. Virus identification techniques such ELISA, HA and HAI, CFT, NT, immunofluorescence test, Blotting (Western, Southern, Northern), RIA, PCR and sequencing. Disinfection and sterilization.</p>
536	Research Methodology	<p>Scientific knowledge and scientific research. Forms of scientific research. Design of scientific research. Epidemiological research. Description of populations. Sampling. Mortality indicators. Morbidity indicators. Case-control studies – Odds ratios. Cohort studies – Relative and attributable risk. Clinical trials. Accuracy of measurements. Measurement errors: Random and systematic errors. Writing of a scientific paper.</p>

Medical Laboratories Department – Unit description

6th SEMESTER

631	Immunology	<p>This unit studies the relationship between the body systems and immunity. Detailed introduction to the basic principles of immunology such as, innate immune system, antibodies, antigens, specific cells B, T –Lymphocytes. Furthermore the immunodeficiency, the autoimmunity, the vaccines and vaccination, allergies, MHC system, cytokines, immunotherapy, monoclonal antibodies.</p> <p><i>Laboratories:</i> Laboratory-oriented lecture and practice series, such as Nephelometry, Elisa, dilutions, RPR, CRP, ASTO, Reumatoidis arthritis, direct and indirect COMMBS, flow cytometry.</p>
632	Clinical Chemistry III	<p>Structure, function, mode of action, and their classification by BRUNO HESS. Analysis of definitions of enzyme activity, factors that affect it as well as the classes of chemical reactions, their kinetics and the Michaelis-Menten law. Acid-base balance, the regulatory systems of the human organism, and its disorders. All the above applies to human blood serum and measurements using modern techniques.</p>
633	Haematology III	<p>The aim of the unit is for the students to acquire knowledge relating to pathological conditions of the blood and its elements and laboratory methods used for the study of blood and its components.</p> <p>Pathological conditions such as lymphoma and myeloma is described as well as platelets, hemostasis, coagulation factors and their mechanism of action and coagulation disorders.</p> <p><i>Laboratories:</i> Use of blood analyzer, Platelet count, PT, aPTT and TT count, Coagulation factor I to XIII count, Interpretation of results.</p>
634	Laboratory Quality Assurance	<p>Volatility of laboratory measurements. Factors that determine the accuracy and reliability of laboratory tests. Sensitivity, specialty, Positive and negative diagnostic value of laboratory tests. Interpretation of laboratory results. Verification of accuracy and reliability of laboratory tests. Internal and external quality control - Interpretation of the results of quality control - Westgard rules. Laboratory Quality Assurance Methods and Systems and Laboratory Examinations. Accreditation systems of medical laboratories. Diagnostic test and benchmarking of laboratory tests. Laboratory epidemiology - design of laboratory investigations.</p>
635	Biotechnology Applications in Medicine	<p>This unit includes the basic concepts and methodologies of the genetic modification of organisms, cells and molecules, as well as modern methodologies applied to serve human health. Students will also be encouraged to make a more general critical assessment of biotechnology in the economic, social and ethical issues that surround this science.</p> <p>Nucleic acids, Principles of molecular biology, Recombinant DNA technology, Polymerase Chain Reaction, Restriction endonucleases, Techniques of analysis of mutations and polymorphisms, DNA sequencing, Hybridism, Molecular Diagnostics, The chromosomal basis of human disease, Genetic diseases of human, Infectious diseases, Applications of molecular diagnostics in pathology, Antibiotics - monoclonal antibodies – vaccines - pharmaceutical proteins and others.</p> <p><i>Laboratories:</i> Introduction to Medical Biotechnology, Handling Micropipettes, DNA isolation from peripheral blood, Isolation of RNA from peripheral blood, Nucleic acid spectrophotometry, Polymerase Chain Reaction (PCR) - Method Analysis, Polymerase Chain Reaction-Applications, Polymerase Chain Reaction-based PCR methods, Agarose gel electrophoresis, Polymorphisms and mutations - their importance in the molecular diagnosis of diseases, The usefulness of Restriction endonucleases, Preparation and analysis of Karyotype.</p>

Medical Laboratories Department – Unit description

7th SEMESTER

731	Pharmacology - Toxicology	This unit introduces students to the basic principles of pharmacology and toxicology. It provides a foundation for understanding the principles of drug metabolism, drug interactions, and mechanism of action of drugs. Actions and effects of drugs on the central nervous system, cardiovascular system, respiratory system & endocrine systems are covered. Specific areas of toxicology include chemical carcinogenesis, specific organ toxicology, toxic compounds, occupational toxicology.
732	Mycology - Parasitology	a) General information about fungi - morphology - reproduction. Fungal diseases in humans. Application of laboratory methods for the diagnosis of fungal infections. b) Main categories of parasites. Life cycle of parasites, way of transmission of parasitic diseases and their prophylaxis. Laboratory diagnosis of parasitic diseases from clinical samples. Preparation of suspected material for detection of particular parasites. Microscopic identification of certain parasites.
733	Clinical Chemistry IV	Results Quality Assurance - Liver Function Control - Pancreatic Function Control - Gastric Liver and Intestinal Function - Cerebrospinal Fluid - Endocrine Function and Hormones Control - Vitamins - Biocomponents: Macro Elements and Trace Elements - Cancer Indexes - Xenobiotics: Medicines and Toxic Compounds - Porphyrin, Iron. <i>Laboratories:</i> Determination and result interpretation of amylase, glucose in the CSF, total albumin in CSR, vitamins, ethanol, salicylates, iron, sodium and potassium, identification of cancer indicators, determination and clinical significance of changes in serum hormone concentration as pathological markers.
734	Medical Professions Ethics & Labor Relations	a) Ethics of Health Professions. Ethical values. Principles of medical ethics. Ethical rules guiding health professionals in their relationships with patients, colleagues and the community. Professional attitudes and behavior. Ethical principles related to patient treatment. Patient rights. Ethical obligations of health professions towards society. b) Labor relations in the health sector. Concept and role of labor - The work environment. The effects of work environment on humans. Employment contracts. Forms and content of employment contracts. Employee rights and obligations. Rights and obligations of employers. Trade unions and trade union rights.
735	Principles of Hygiene	Environmental factors affecting health. Water hygiene and water-borne communicable diseases. Food hygiene and food-borne communicable diseases. Waste management and waste hygiene. Ambient air hygiene. Behavioral and personal risk factors associated with modern morbidity Sexually transmitted diseases. Hospital hygiene and hospital infections. Epidemiology of hospital infections. Methods of prevention of hospital infections. Epidemics, investigation and management of outbreaks. Sterilization and disinfection – Disinfectants. Prevention of infectious diseases – Vaccines.

8th SEMESTER

CODE NUMBER	UNIT	
2000	Thesis	Graduation thesis
3000	Practical Training	Six months practical training in Medical Laboratories