MED 3003: INTEGRATION OF BASIC SCIENCES TO CLINICAL SCIENCES I		
Course Date	October 05-30, 2020	
Exam Dates	Theoretical Exam: October 28, 2020	
Course Coordinator:	FATİH ÖZDENER	
Academic Unit	**Academic Staff**	**Theoretical hours**
Clinical Anatomy	Çağatay Barut, Prof.	1
Clinical Biochemistry	Yeşim Neğiş, Assoc. Prof. Özlem Unay, Assist. Prof. Erdem Yılmaz, Assist. Prof. .	3
Clinical Microbiology	Orhan Cem Aktepe, Prof. Gülden Çelik, Prof.	6
Clinical Pathology	Özlem Yapıcier, Prof.	8
Clinical Pharmacology	Fatih Özdener, Assist. Prof. Zülfiye Gül, Assist. Prof.	15
Clinical Physiology	Sema Tülay Köz, Assoc. Prof Faize Elif Bahadır, Assist. Prof.	4
Research Methodology	Sebahat Dilek Torun, Assoc. Prof Melike Yavuz, Assist. Prof. Petek Eylül Taneri, Assist. Prof.	9
TOTAL		46

COURSE AIM:

The aim of this course is to provide the integration of basic sciences with the most common internal diseases.

LEARNING OUTCOMES:

At the end of this lesson, the student will be able to:		
DEP.	**TOPIC**	**LEARNING OUTCOMES**
CLINICAL ANATOMY	Pulmonary Embolism (T-1)	1. Discuss the clinical anatomy of lungs and pulmonary circulation 2. Identify the main structures of the lungs and related vessels 3. Define pulmonary embolism in relation to vascular anatomy of the lungs 4. Describe the characteristic and clinical presentations of pulmonary embolism in relation to clinical anatomy 5. Recognize how pulmonary emboli affect the morphology and functions of the lungs and the related vessels

At the end of this lesson, the student will be able to:		
DEP.	**TOPIC**	**LEARNING OUTCOMES**
CLINICAL BIOCHEMISTRY	Hypertension/ CAD/Heart Failure/Arrhythmias (T-1)	1. Describe the laboratory findings in hypertension 2. Define cardiac enzymes and their change of levels by time in coronary artery disease 3. Describe Brain Natriuretic Peptide (BNP) and its correlation with heart failure 4. Describe the laboratory changes in arrhythmias
	Diabetes (T-1)	1. Classify types of diabetes 2. Identify the acute and chronic complications of diabetes 3. Explain the pathogenesis of diabetes 4. Explain the effect mechanism of insulin and oral anti diabetic agents 5. Explain the biochemical laboratory tests for diagnosis of diabetes
	Anemia (T-1)	1. Classify types of anemia 2. List the laboratory parameters used for diagnosis of anemia 3. Define the use of laboratory parameters in the differential diagnosis of anemia

At the end of this lesson, the student will be able to:		
DEP.	**TOPIC**	**LEARNING OUTCOMES**
CLINICAL MICROBIOLOGY	Fever etiology in Infectious origin (T-1)	1. Define fever and fever types 2. Explain the mechanism of fever 3. List the definitions of fever of unknown origin 4. List the infectious etiological agents responsible from fever 5. List the steps in investigating fever of unknown origin
	Cardiovascular System Infections (T-1)	1. List the main group of microorganisms responsible from cardiovascular system infections 2. Explain the pathogenesis 3. List the main methods in the laboratory diagnosis 4. List the main advantages and disadvantages of the methods and interpretation of the results 5. List the preventive measures and the routine recommended antimicrobial treatment
	Upper Respiratory Tract Infections (T-1)	1. Recall the anatomical structure 2. List the main group of microorganisms responsible from upper respiratory tract infections 3. Explain the pathogenesis 4. List the main methods in the laboratory diagnosis 5. List the main advantages and disadvantages of the methods and interpretation of the results 6. List the preventive measures and the routine recommended antimicrobial treatment

	Lower Respiratory Tract Infections - TB (T-1)	1. List the main group of microorganisms responsible from lower respiratory tract infections 2. Explain the pathogenesis 3. List the main methods in the laboratory diagnosis 4. List the main advantages and disadvantages of the methods and interpretation of the results 5. List the preventive measures and the routine recommended antimicrobial treatment
	Urinary Tract Infections (T-2)	1. Recall the anatomical structure 2. List the main group of microorganisms responsible from urinary tract infections 3. Explain the pathogenesis 4. List the main methods in the laboratory diagnosis 5. Recall interpretation of the results 6. List the preventive measures and the routine recommended antimicrobial treatment
	Gastrointestinal System Infections (T-2)	1. List the main group of microorganisms responsible from gastrointestinal system infections 2. Explain the pathogenesis 3. List the main methods in the laboratory diagnosis 4. List the main advantages and disadvantages of the methods and interpretation of the results 5. List the preventive measures and the routine recommended antimicrobial treatment

At the end of this lesson, the student will be able to:		
DEP.	**TOPIC**	**LEARNING OUTCOMES**
CLINICAL PATHOLOGY	Hypertension / Coronary Artery Disease (T-1)	1. Describe the effects of hypertension on the heart and the arteries 2. Explain pathologic basis of coronary artery disease 3. Compare subendocardial and transmural myocardial infarction 4. Get through to the causes of secondary hypertension 5. Describe pathogenesis and causes of syncope 6. Explain the causes of cardiac and noncardiac dyspnea
	Heart Failure / Arrhythmias (T-1)	1. Describe pathogenesis of heart faire and major complications of myocardial infarction 2. Explain pathogenesis of arrhythmia and conduction abnormalities 3. Describe pathogenesis of right heart failure 4. Describe pathogenesis of left heart failure
	Pulmonary Emboli / Pneumonia / Tuberculosis (T-1)	1. Get through the risk factors for lung diseases with associated specific diseases 2. Describe sources and causes of hemoptysis with related diseases 3. Explain pathogenesis and morphological findings of tuberculosis 4. Get through the differential diagnosis of granulomatous inflammation 5. Get through to the microscopic location of the inflammation in classifying pneumonias 6. Describe the complications of pneumonia 7. Get through to risk factors predisposing to pulmonary embolism 8. Explain the complex changes in the pulmonary vasculature and other parts of the lungs due to pulmonary emboli
	Bronchiolitis / Asthma / COPD (T-1)	1. Describe the pathogenesis of allergic and idiosyncratic forms of asthma 2. Explain pathologic changes in chronic obstructive pulmonary disease
	Diabetes (T-1)	1. Get through to causes of polyuria by describing the mechanism and findings of the clinical conditions 2. Describe the metabolic changes in diabetes 3. Explain the clinically important complications of diabetes mellitus and pathologic changes 4. Describe the pathogenesis of leg gangrene
	Goiter / Obesity (T-1)	1. Get through to the clinical manifestations of Graves' disease 1. Get through to clinical features of hypothyroidism 2. Describe the pathologic conditions causing thyroid enlargement

		3. Describe the associated conditions with obesity seen in polycystic ovary syndrome 4. Explain the mechanisms of obesity in diabetes mellitus 5. Describe the obesity related endocrine disorder
	Peptic Ulcer / Diarrhea/Hepatitis (T-1)	1. Describe the causes of inflammatory and noninflammatory acute diarrhea 2. Explain the pathogenesis of chronic diarrhea 3. Describe the differential diagnosis of ulcerative colitis and Crohn's disease 4. Get through to factors play an important pathogenic role in peptic ulcer disease 5. Describe the most important complications of peptic ulcer disease 6. Get through to indications of liver biopsy 7. Describe the key histologic features of acute hepatitis 8. Classify the causes of chronic hepatitis and describe the histologic changes in cirrhosis
	Anemia (T-1)	1. Explain the etiology and pathogenesis of iron deficiency anemia

At the end of this lesson, the student will be able to:		
DEP.	**TOPIC**	**LEARNING OUTCOMES**
CLINICAL PHARMACOLOGY	Essential Hypertension (T-1)	1. Explain the main action the most likely mediates the long-term antihypertensive effect of thiazides 2. Describe the main cardiovascular action that mediates the antihypertensive effect of amlodipine 3. Describe a primary contraindication to the use of ACE inhibitors 4. Describe the action mediating the antihypertensive effect of clonidine 5. Identify the drug used to manage the patient's hypertensive crisis 6. Describe the molecular mechanism of action of the most common drugs used to manage the hypertensive crisis 7. Identify the specific reason for the choice of drug used to treat the patient's hypertensive crisis
	Myocardial Infarction (T-1)	1. Explain the main action that mediates the therapeutic effect of nitroglycerin in myocardial infraction 2. Identify the endogenous compound that mediates the pharmacological action of nitrates 3. Explain the main action that mediates the analgesic effect of morphine 4. Explain the molecular mechanism of action of alteplase 5. Describe a serious adverse effect that can occur after the administration of alteplase 6. Identify the endogenous compound that function as a molecular target of enoxaparin 7. Describe an advantage of enoxaparin over the standard unfractionated heparin
	Atrial Fibrillation (T-1)	1. Recognize the disease that can be prevented by warfarin therapy in patient with Atrial Fibrillation (AF) 2. Describe a step of the coagulation cascade that is specifically inhibited by warfarin 3. Explain the reason for the use of diltiazem in AF 4. Explain mechanism of action of diltiazem 5. Identify the site of action of diltiazem in AF 6. Identify the drug to be used for maintenance of normal sinus rhythm after cardioversion
	Heart Failure (T-1)	1. Identify the primary site of action of furosemide 2. Describe the main action underlying the therapeutic effect of furosemide in heart failure 3. Explain the primary reason for diuretic-induced hypokalemia

		4. Explain why loop diuretics are far more effective than thiazide diuretics 5. Identify the drug that can cause tinnitus, hearing loss and vertigo 6. Explain the molecular mechanism of action of carvedilol 7. Explain the mechanism of digoxin-induced nausea and vomiting
	Pulmonary Embolism (T-1)	1. Explain the mechanism of action of protamine in cases of heparin overdose 2. Identify the coagulation factor that is most sensitive to heparin-induced inhibition 3. Identify the coagulation factor that represents the molecular target of dabigatran 4. Identify the drug to be used in cases of serious dabigatran overdose
	Pneumonia (T-1)	1. Identify the enzyme specifically inhibited by levofloxacin 2. Identify the correct activity of fluoroquinolones 3. Identify the correct activity spectrum of third-generation cephalosporins 4. Identify the primary site of action of ceftriaxone 5. Explain the mechanism of action of azithromycin 6. Identify the common mechanism for bacterial resistance to cephalosporins, macrolides, and fluoroquinolones 7. Explain the mechanism of action of aminoglycosides
	Asthma (T-1)	1. Identify the molecular action mediating the therapeutic effect of albuterol in asthmatic patients 2. Identify the enzyme whose inhibition mediates the anti-inflammatory effect of fluticasone 3. Explain why adverse effect of inhaled glucocorticoids are extremely rare 4. Explain the mechanism of action of montelukast 5. Explain the mechanism of action of clotrimazole
	Chronic Obstructive Pulmonary Disease (T-1)	1. Explain the likely mechanism of albuterol-induced tremor 2. Explain the mechanism of action of losartan 3. Identify the two receptors that are blocked by ipratropium 4. Identify the most common adverse effect of ipratropium 5. Explain the mechanism of action of diltiazem 6. Explain the mechanism of action of montelukast 7. Describe a proposed mechanism of the bronchodilating action of theophylline
	Type 1-Diabetes Mellitus (T-1)	1. Explain the mechanism of action of insulin 2. Describe the physiological effects of insulin on glucose, fat and protein metabolism 3. Describe the different type of insulin preparations and their therapeutic application in the management of DM1 4. Describe the appropriate precautions to be taken while on insulin therapy to prevent its adverse effects 5. Describe the adverse effect of insulin therapy
	Type 2-Diabetes Mellitus (T-1)	1. Explain the mechanism of action of metformin 2. Describe the adverse effect of metformin 3. Explain the mechanism of action of fluconazole 4. Describe the mechanism of action of sulfonylureas 5. Describe the mechanism of action of pioglitazone 6. Describe the adverse effect of pioglitazone 7. Describe the pharmacology of incretin-mimetic agents
	Graves' Disease (T-1)	1. Identify a drug to be used for rapid management of cardiac symptoms in a patient with Graves' disease 2. Describe the adverse effect of thioamide agents 3. Describe the therapeutic uses of recombinant granulocyte-colony stimulating factor 4. Describe the mechanism of action of radioactive iodine in the treatment of Graves' disease 5. Identify a drug to be given to hyperthyroid patients with exophthalmos 6. Describe the mechanism of action of levothyroxine
	Addison's Disease (T-1)	1. Identify a drug to be used for management of Addison's disease 2. Describe the mechanism of action of mineralocorticoids

		3. Describe the adverse effects of fludrocortisone
	Peptic Ulcer Disease (T-1)	1. Identify the enzyme that is inhibited by omeprazole 2. Explain the reason for the long duration of action of omeprazole 3. Explain the pharmacokinetic action that can account for the high concentration of omeprazole in the stomach lumen 4. Identify the site of action of erythromycin 5. Describe the property of H. pylori that makes it very sensitive to metronidazole 6. Explain the mechanism of action of bismuth salt in peptic ulcer disease
	Iron Deficiency Anemia (T-1)	1. Describe the optimal duration of an iron therapy for iron-deficiency anemia 2. Describe a common adverse effect of oral iron preparations 3. Describe a rare but life-threatening adverse effect of intravenous iron administration 4. Describe the optimal duration of an oral iron therapy for iron-deficiency anemia 7. Identify the most likely cause of the anemia-induced increase in serum transferrin

At the end of this lesson, the student will be able to:		
DEP	**TOPIC**	**LEARNING OUTCOMES**
CLINICAL PHYSIOLOGY	Cardiac arrhythmias and their electrocardiographic reflections (T-1)	1. Describe the normal sinus rhythm ECG 2. Classify arrhythmias 3. Define the concepts of tachycardia and bradycardia 4. Name common arrhythmias and describe the anatomical region that is responsible from the arrhythmias 5. Describe the electrical mechanisms of arrhythmias and their electrocardiographic reflections 6. Explain treatment strategies of arrhythmias based on pathophysiological mechanisms 7. Name electrolyte disorders that can trigger arrhythmias
	Physiological Basis of Asthma (T-1)	1. Describe the major clinical features of asthma and acute asthmatic attack 2. Describe the changes in the airways in asthma 3. Describe changes in lung volumes, capacities and air flows in asthma 4. Describe the changes in blood oxygen and carbon dioxide content in asthma 5. Describe the immunological, neuromuscular and metabolic events that play role in the pathophysiology of asthma 6. Explain treatment strategies of asthma based on physiological alterations
	Physiological Basis of Goiter (T-1)	1. Describe the characteristic hormonal changes in hyperthyroidism 2. Identify the mechanisms that cause hyperthyroidism. 3. Explain the physiological basis of the signs and symptoms of hyperthyroidism 4. Describe the effects of hyperthyroidism at the cell and organ systems level 5. Name the reasons that cause goiter 6. Explain treatment strategies of hyperthyroidism based on pathophysiological mechanisms
	Case discussions on gastrointestinal system (T-1)	1. Describe the roles of the gastrointestinal tract structures in regards to motility, secretions, and digestion and absorption on normal physiological condition 2. Explain the pathophysiology on common gastrointestinal disorders and symptoms, such as irritable bowel diseases, steatorrhea, diarrhea , Zollinger-Ellison syndrome.

At the end of this lesson, the student will be able to:		
DEP	**TOPIC**	**LEARNING OUTCOMES**
RESEARCH METHODOLOGY	Introduction to the course / Concept of Research and Research Methodology (T-1)	1. Explain the term research 2. Distinguish between common uses of the term *research* and scientific research 3. List the objectives of research 4. Explain the significance of research 5. Describe the different types of research 6. Distinguish between research methods and research methodology
	Research Process - An overview (T-1)	1. Explain the major phases of the research process 2. List the steps of research process in correct order 3. Explain each step of research process briefly 4. Explain the criteria of good research
	Formulating the Research Problem (T-1)	1. Define what is a research problem 2. List the sources of research problems 3. Differentiate a researchable and non-researchable question 4. Explain the factors to consider in selecting research problems 5. List the steps involved in formulating a research problem 6. Identify the characteristics of a good research problem 7. Demonstrate how to formulate research objectives 8. Define operational definitions
	Literature review (T-1)	1. Explain the place of literature review in research process 2. Explain the functions of literature review as a part of research process. 3. Explain the steps in conducting a literature review.
	Abstract and Index Data Bases (T-1)	1. Define abstract and index 2. Explain the differences between abstract and index 3. List the major abstract and index online databases
	Constructing Hypothesis (T-1)	1. Describe what is a hypothesis 2. Describe the functions of a hypothesis in a research 3. Explain the characteristics of a good hypothesis 4. Compare null hypotheses and research hypotheses 5. Differentiate the types of hypotheses 6. List the prerequisites for the validity of a hypothesis test
	Epidemiology and Research (T-1)	1. Define the term 'epidemiology' 2. Describe the principles and objectives of epidemiology 3. Identify the basic terms of epidemiology
	Descriptive Studies (Case report, case series, ecologic studies) (T-1)	1. Describe the case report, case series, ecologic studies 2. Identify the advantages and disadvantages of case report, case series, ecologic studies 3. Define ecological fallacy
	Cross-Sectional Studies (T-1)	1. Describe the cross-sectional study design 2. Define the sampling process in cross sectional studies 3. State the definition and the formula of the prevalence 4. Identify the advantages and disadvantages of cross-sectional studies