UNIVERSITÀ DEGLI STUDI DI BARI ALDO MORO

dipartimento di farmacia-scienze del farmaco

General information	
Academic subject	General pathology and medical terminology
Degree course	Pharmacy
Year of study	3rd
European Credit Transfer and Accumulation System (ECTS)	8
Language	Italian
Academic Year	2021/2022
Academic calendar (starting and ending date)	1st semester: sept 20, 2021 – jan 21, 2022.
Attendance	compulsory

Professor/ Lecturer Course A-E	
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Syllabus	
Learning Objectives	The course is aimed at understanding (i) the cellular and molecular basis of disease, (ii) the effects of pathological modifications on physiological systems/processes, and (iii) the clinical reasoning fundamentals.
Course prerequisites	Basic knowledge of cellular and molecular biology, biochemistry, human anatomy, and physiology.
Contents	The course is divided in 12 Units, for 80 hours of academic lectures (from September to January). INTRODUCTION. General pathology: disciplinary area and specific aims in a Pharmacy degree course. 1. THE CELL AS UNIT OF HEALTH AND DISEASE. The cells respond to harmful events

	in various ways, evidenced by distinct morphological and functional modifications. In this module, the most relevant injurious agents and their mode of action are presented, along with the main cell response modalities, and cell death. Topics. Cell adaptation (hypertrophy, hyperplasia, atrophy, metaplasia). The cell damage and its main mechanisms (hypoxia and ischemia, oxidative stress, toxic injury, endoplasmic reticulum stress, disturbance in Calcium homeostasis, DNA damage). Cell death (necrosis, apoptosis, autophagy). Intracellular accumulations. Cellular aging. 2. THE RESPONSE TO THE DAMAGE: INFLAMMATION. Damage-associated microenvironment modifications are recognized by specific cellular and molecular systems (innate immunity), which trigger a damage response called Inflammation, evidenced by distinct morphologic and functional modifications of vascularized tissues. Topics. Definitions and general features of inflammation. Acute inflammation: vascular modifications, leucocyte recruitment and activation, inflammation-associated tissue damage. Mediators of inflammation: vasoactive amines, arachidonic acid metabolites, cytokines and chemokines, complement and kinin systems, nitric oxide. Morphologic features and outcomes of acute inflammation. Chronic inflammation: causes and mechanisms, morphological features. Systemic effects of inflammation: fever, acute phase response, leucocytosis. Overview of tissue repair. 3. IMMUNOLOGY AND IMMUNOPATHOLOGY. The immune system is vital for survival, protecting us from infectious agents and cancer development. However, the immune system can be involved in disease processes caused by too little or too much immunologic reactivity. Topics. The infectious diseases and the immune system: introduction and general features. The innate immunity: cells, cell functions, and molecular systems. The adaptive immunity: cells, cell functions, and antigen receptors: introduction and general features. B cell activation and humoral response, antibody structure and function; T cell activation and cellular response. Antigen processing, presentation, and recognition; MHC system; Th response (Th1, Th2, Th17); Tc response. Immunologic memory. Immunologic tolerance. Immune-mediated damage and hypersensitivity reactions (types I-IV). Autoimmunity: pathogenic mechanisms and autoimmune diseases. Primary and secondary immunodeficiency diseases; HIV and AIDS. Rejection of transplants. Amyloidosis. 4. HEMOSTASIS, HEMORRAGIC DISORDERS, AND THROMBOSIS. Blood vessel structural integrity is maintained by the haemostasis system, which also prevents blood loss associated with vascular wall damage. When haemostatic mechanisms are either blunted or insufficient, haemorrhagic disorders occur. By contrast, an inappropriate activation of haemostasis may hinder the blood flow (thrombosis). Topics. Physiological haemostasis: cellular and molecular components. Primary and secondary haemostasis: the formation of blood clot and the regulatory mechanisms (antithrombotic mechanisms, fibrinolysis). The haemostatic balance and the role of endothelial cells. Haemorrhagic disorders: primary haemostasis defects (platelet defects, and von Willebrand disease); coagulation factor defects. Thrombosis: endothelial injury, stasis or turbulent blood flow, and hypercoagulability; fate of the thrombus; pulmonary embolism. 5. BLOOD VESSEL PATHOLOGY, AND CARDIOVASCULAR DISEASES. Vascular pathology, in particular of arteries, is responsible for more morbidity and mortality that any other group of human disease. In this module, the structural and functional features of vessel wall are summarized, and the main causes of vessel

	damage along with pathological modifications are presented. Topics. Properties and functions of endothelial cells; endothelial activation and dysfunction; vascular wall response to injury (intimal thickening); atherosclerosis (definition, pathogenesis and progression, pathophysiology of clinical outcomes. Hypertensive vascular disease: definition, essential and secondary hypertension, vascular pathology and clinical outcomes of hypertension. The ischemic heart disease: definition and pathogenesis. The major clinical entities of ischemic heart disease (angina, myocardial infarction, chronic ischemic heart disease, sudden cardiac death): pathological basis and pathophysiology. The heart failure: definitions; left and right heart failure (causes, pathogenesis, and pathophysiological consequences). Risk factors for atherosclerosis-based diseases. 6. KIDNEY DISEASES. The kidneys excrete the waste products of metabolism, contribute to the regulation of fluid/salt homeostasis and plasmatic pH, and serve as endocrine organs. Renal diseases affect the four basic anatomical components: glomeruli, tubules, interstitium, and blood vessels. Topics. Renal function evaluation. Morphological and clinical classification of renal diseases. Glomerular diseases: pathologic response of the glomerulus to injury; aetiology, pathogenesis, and main clinical entities. Nephrotic and nephritic syndromes. Tubular and interstitial diseases. Vascular diseases. Chronic kidney disease. Urinary tract infections. 7. GASTROINTESTINAL AND LIVER PATHOLOGY. Extending from the oral cavity to the anus, the gastrointestinal tract consists of anatomically and functionally distinct segments. In this module, some major diseases of oesophagus, stomach, intestinal and liver are treated. Topics. Esophagitis. Inflammatory gastric diseases (acute gastritis, chronic gastritis, peptic ulcer disease). Infectious enterocolitis. Inflammatory bowel disease (Chron disease, and ulcerative colitis). The liver diseases: alcoholic disease (pathological and clinical entities); viral hepatitis; non-alcoholic fatty liver disease. Laboratory evaluation of hepatic injury and function. 8. HEMOPOIESIS ALTERATIONS: ANEMIAS. The anaemias are very common red cell deficiency conditions, which compromise the oxygen-carrying capacity of the blood. Topics. Anaemia: definitions, blood count, and general clinical features. Pathogenic classification of anaemia (blood loss, haemolysis, decreased red cell production). The most common forms of anaemia in human pathology: iron deficiency anaemia, chronic disease anaemia, megaloblastic anaemia, qualitative and quantitative hemoglobinopathies, haemolytic anaemias. 9. ENDOCRINE SYSTEM PATHOLOGY. The endocrine gland system orchestrates a state of metabolic equilibrium among the various organs of the body. Various pathological processes of endocrine glands may disturb the normal activity of the system, either underproduction or overproduction of hormones leading to biochemical and pathophysiological effects. Topics. The pituitary, thyroid, and adrenal glands: main diseases characterized by hormonal overproduction or underproduction. Diabetes mellitus: definition and diagnostic criteria; pathogenesis, pathophysiology and clinical features of type 1 and type 2 diabetes. 10. RESPIRATORY SYSTEM. In the respiratory system, the lungs carry out the fundamental function of exchanging gases between inspired air and blood. Topics. Acute bronchitis and pneumonia; obstructive lung disease (chronic bronchitis, asthma, emphysema). 11. CENTRAL NERVOUS SYSTEM. Neurons and other cells of the central nervous

	system show specific biological features, which affect the action of damaging agents and cell injury outcomes. Topics. Acute and chronic neuronal damage. Demyelinating disease (multiple sclerosis). Neurodegenerative diseases: definition, pathological features and pathogenesis of Alzheimer, Parkinson, and Huntington diseases. 12. ONCOLOGY. After cardiovascular diseases, cancer is the second cause of death in the world and comprises several pathological conditions distinct as far as pathogenesis, natural history, and prognosis are concerned. Topics. Nomenclature and definitions. Classification criteria (benign and malignant tumours, histogenetic and molecular classifications). Cellular and molecular basis of carcinogenesis. The tumour cell phenotype: cellular and molecular features. Genetic basis of tumour cell phenotype; driver and passenger mutations; oncogenes and tumour suppressor genes; epigenetic alterations. The causes of cancer: chemical, physical, and biological carcinogenesis. Clinical aspects of cancer disease; tumour grading and staging; cancer prevention.
Books and bibliography	-Robbins Fondamenti di Patologia e di Fisiopatologia, Edra 2013. -Robbins Basic Pathology 10th edition, Elsevier 2018
Additional materials	Teaching material is provided at the beginning of each module.

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
200	80		120
ECTS			
8			

Teaching strategy	
	Academic lectures; video lessons, and internet-based video lessons.
Expected learning outcomes	
Knowledge and understanding on:	By the end of the course, the students will be able to explain how various injurious agents can disrupt cell homeostasis and tissue/organ physiological functions.
Applying knowledge and understanding on:	By the end of the course, the students will be able to understand the pathological basis underlying clinical reasoning and therapy. -describe the main pathological features associated with disease processes, and use etiopathogenesis and pathophysiology knowledge to carry out their professional activity (interaction with customers, patients, and other healthcare workers).
Soft skills	By the end of the course, the students will be able to describe the main pathological features associated with disease processes and use etiopathogenesis and pathophysiology knowledge to carry out their professional activity (interaction with customers, patients, and other healthcare workers).

Assessment and feedback	
Methods of assessment	The exam consists of two compulsory parts: a written test and an oral test.
Evaluation criteria	Written test: it includes three free-answer questions, to be answered in one hour. The evaluation criteria include: • Knowledge and understanding ○ Appropriate understanding of the question, and answer development • Applying knowledge and understanding

	○ appropriate organization of thought and ideas ○ ability to synthesize ○ property of language and terminology Oral test: the oral test consists of two questions posed by the members of the examination board. The exam aims to evaluate: (i) the knowledge acquired on the course contents; (ii) the ability to expose and argue by making the necessary logical-deductive connections; (iii) the appropriateness of the scientific language.
Criteria for assessment and attribution of the final mark	**Written test**. The written test is evaluated by an assessment of suitability: for admission to the oral test, at least two answers must be judged as "satisfactory", according to the evaluation criteria. **Oral test**. The oral test follows and integrates the written test in the same exam session, and allows the expression of the final mark in 30-point scale, as described in the following. -18-20: basic knowledge without serious gaps. Exposition and language acceptable. -21-25: basic knowledge without gaps. Ability to expose and argue in partial autonomy. Discrete language appropriateness. -26-29: good/very good knowledge but with inaccuracies that compromise the achievement of full marks. Ability to autonomously analyze and argue. Exposure of concepts in the right succession and mastery of the language. -30-30L: full preparation, consolidated and without inaccuracies. Ability to autonomously analyze and argue. Exposure of concepts in the right succession and mastery of the language.
Additional information	