

## Degree Course in Dentistry and Dental Prosthetics 2022/2023

**Course:** General pathology

**SSD:** MED 04

**CFU Number:** 8

**Course coordinator:**

**Federica Wolf (4), Cristina Capuano (3), Alessandra Rufini (1).**

### **PREREQUISITES**

Basic knowledge in Physics, Biochemistry, Biology, Genetics, Molecular Biology, Physiology

### **LEARNING OBJECTIVES**

General Pathology deals with the morphological and functional modifications that are associated with diseases. In particular, the mechanisms of diseases are approached from the causes of diseases (aetiology), the reaction of the organism to these conditions through the innate and/or adaptive responses, the specific pathogenetic mechanisms that characterize different diseases, among which tumors, and the the pathophysiological consequences at the level of the major homeostatic systems (blood, hemostasis, circulation, endocrinology and metabolism).

### **LEARNING OUTCOMES**

#### **Knowledge and understanding**

At the end of the course, the student should know the principal causes of molecular and cellular damage, the major organism response mechanisms (innate and adaptive immunity, repair process) and consequent pathological processes (acute and chronic inflammation, cancerogenesis, regressive phenomenon) and the principal pathophysiologic alteration.

#### **Applying knowledge and understanding**

At the end of the course, the student should demonstrate the capability to apply the acquired knowledge showing to identify the different steps of the pathogenetic process (from cell damage to pathophysiological consequences) for a better comprehension of odontoiatric diseases and associated conditions

#### **Communication skills**

At the end of the course, the student should be able to communicate his/her knowledge with the appropriate terminology, in order to transmit clearcut, unambiguous concepts to both expert and non expert recipients.

#### **Making judgements**

At the end of the course, the student should demonstrate to be able to independently use knowledge and competences to identify diseases and their possible consequences in dentistry.

### **Learning skills**

At the end of the course, the student should have acquired independent method for studying and updating through different kind of literature or through scientific literature search on appropriate scientific databases.

### **COURSE SYLLABUS**

- Course Introduction. The topics of general pathology (etiology, pathogenesis, pathophysiology), Concepts of health and disease. Definition of disease, illness and syndrome. (Prof. Wolf)
- General Etiology: disease classification based to etiologic agents: congenital and acquired, Pathological effects of physical, chemical and biologic agents. Environmental and genomic pathology. (Prof. Wolf)
- Cell Pathology: reaction to damage, cell stress, adaptation. Regressive processes, intra/extracellular accumulation, cell death (necrosis and apoptosis).(Prof. Wolf)
- Innate Immunity: acute inflammation, vascular phenomena, diapedesis, exudate classification, cleanup phase, outcomes, chronic inflammation, interstitial and granulomatous. Repair process scarring and fibrosis. (Prof. Capuano)
- Adaptive Immunity: principles of immunology and immunopathology (Prof. Capuano, Rufini):
  - Introduction to immune system, general characteristics of innate and adaptive immunity, principal differences.
  - Leucocyte circulation and tissue migration.
  - Antigen and Antibodies
  - Antigen trapping and presentation to lymphocytes, major histocompatibility complex (MHC) molecules.
  - Antigen recognition and lymphocyte antigen receptor structures.
  - Lymphocytes development and generation of antigen-receptor diversity repertoire.
  - Cell-mediated Immunity – Activation and function of T-lymphocytes.
  - Humoral Immunity - Activation of B-lymphocytes and antibody production.
  - Effector mechanism of humoral immunity.
  - Hypersensibilities and allergies.
- Oncology: Tumor classification, biological characteristics of tumor cells, metastatization, physical and chemical cancerogenesis. Molecular basis of neoplastic transformation: biological cancerogenesis, oncogenes oncosuppressors, therapeutic approaches. (Prof. Wolf)
- Pathophysiology of blood: anemias e RBC pathologies (Prof. Wolf)
- Ciculation Pathophysiology: hemostasis, atherosclerosis, edema, embolia, infarct, shock, hypertension. (Prof. Wolf)
- -Pathophysiology of liver (Prof. Wolf)
- Endocrine Pathophysiology: diabetes (Prof. Wolf)
- Recap of course program and questions. (Prof. Wolf)

## **COURSE STRUCTURE**

Frontal lectures on updated topics. Examples of pathological simulations will be used to help the students understand the process and its involvement in diseases. During the lectures students are invited to participate actively, teachers will solicit them by asking simple questions or expressing their view. Students are also invited to ask questions or clarifications on the discussed topic. The interaction is very important in both ways: it helps the teacher to verify the perception of the students, while give the student the opportunity to verify their understanding and exercise communication skills as well as their autonomous judgment. In addition, during frontal lectures we will try to perform exercises or suggest self-evaluation exercises.

## **COURSE GRADE DETERMINATION**

During the course Teachers are free to review specific topics in order to underline and clarify which are the essential knowledges required for passing the exam.

At the end of the course students should take the oral final exam which consists of minimum 3 questions on the course program. The answers by the student will be evaluated buy the teachers considering: A) the student has shown the essential required knowledge and competences. Through independent studies he/she has achieved the objectives described by Dublin 1, 2 e 5 (see explanation above) B) the student is capable to organize a transversal reasoning to utilize different information gathered during the course, Dublin 3, C) the student communicate in a clear comprehensive and adequate way, Dublin 4.

For the final grade, Teachers will take into consideration the oral exam and the active participation of the student during the lectures of the course. In case the knowledge and comprehension are the minimally required, the grade will be between 18 e 23/30. In case the knowledge and other skills will be good, the grade will be between 24 e 26/30. In case the knowledge and skills will be all very good, the grade will be between 27 e 29/30. Maximum evaluation (30/30) will be awarded if the students has brilliantly achieved all the above listed objectives. For granting the honour (30 e Lode), the committe should agree unanimously

In case of persisiting Covid-19 pandemia with the necessity of social distance or lockdown, we could foresee a remote oral exam by platforms indicated by the Institution and following its recommended rules.

## **OPTIONAL ACTIVITIES**

Teachers are available to meet the students through appointments taken by e-mail.

## **READING MATERIALS**

- Kumar, Abbas, Aster: Robbins Basic Pathology, X Edition, 2017, Elsevier
- A.K. Abbas, A.H. Lichtman, S. Pillai: Basic Immunology: Functions and Disorders of the Immune System, VI edition, 2019, Elsevier.

Teachers can provide learning materials or suggest specific readings.