



## BSc in Nursing

**INTEGRATED TEACHING:** GENERAL PATHOLOGY AND PATHOPHYSIOLOGY

**ECTS CREDITS:** 6

**SSD:** MEDS-02/B, MEDS-02/A, MEDS-03/A

**COURSE COORDINATOR:** Prof. Valentina Trapani

**E-MAIL:** [valentina.trapani@unicamillus.org](mailto:valentina.trapani@unicamillus.org)

Office hours: by appointment only, please arrange by email.

**MODULE:** CLINICAL PATHOLOGY – IMMUNOLOGY, IMMUNOHAEMATOLOGY

**ECTS CREDITS:** 2

**SSD:** MEDS-02/B

**PROFESSOR:** SILVIA CONSALVI

**E-mail:** [silvia.consalvi@unicamillus.org](mailto:silvia.consalvi@unicamillus.org)

**MODULE:** GENERAL PATHOLOGY - PATHOPHYSIOLOGY

**ECTS CREDITS:** 3

**SSD:** MEDS-02/A

**PROFESSOR:** VALENTINA TRAPANI

**E-mail:** [valentina.trapani@unicamillus.org](mailto:valentina.trapani@unicamillus.org)

**MODULE:** MICROBIOLOGY AND CLINICAL MICROBIOLOGY

**ECTS CREDITS:** 1

**SSD:** MEDS-03/A

**PROFESSOR:** YAGAI BOUBA

**E-mail:** [yagai.bouba@unicamillus.org](mailto:yagai.bouba@unicamillus.org)

### **PREREQUISITES**

Basic knowledge of applied physics, biochemistry, biology, genetics, histology, anatomy, and physiology is required.

### **LEARNING OBJECTIVES**

The course aims to:

- provide students with fundamental knowledge of the etiopathogenetic mechanisms of diseases;
- develop the ability to understand pathophysiological processes and related clinical alterations;
- promote the acquisition of skills for interpreting laboratory data and preventing infections.

The overall objective is to foster an integrated understanding of disease processes and their manifestations, enhancing the ability to connect theoretical knowledge with nursing practice in order to develop competencies useful for the prevention, early recognition, and nursing management of patients affected by various pathologies.

## **LEARNING OUTCOMES**

### **Knowledge and Understanding**

At the end of the course, the student will be able to:

- Describe the cellular and molecular mechanisms underlying general pathological processes.
- Demonstrate knowledge of immune and immunopathological mechanisms.
- Understand the pathophysiological principles of the main diseases affecting various organ systems.
- Understand the significance of the main laboratory tests and their role in the diagnosis and monitoring of diseases.
- Know the reference biochemical, haematological, and immunological parameters and their alterations in the most common pathological conditions.
- Describe the structure, characteristics, and replication modes of the main pathogenic microorganisms.
- Understand the mechanisms of microbial pathogenicity and the host immune response.
- Demonstrate knowledge of the characteristics of immune sera and vaccines.
- Understand the basic principles of microbiological diagnostics and pharmacology.

### **Applying Knowledge and Understanding**

At the end of the course, the student will be able to:

- Recognize the main signs and symptoms of pathological alterations and accurately report them within the clinical care context.
- Correctly understand and interpret clinical and laboratory data to support the nursing decision-making process.
- Relate general pathological phenomena to the main pathophysiological and clinical conditions, as well as to nursing interventions for prevention and monitoring.
- Contribute to the planning and implementation of nursing interventions based on an understanding of pathogenic mechanisms and the body's responses to disease.
- Apply infection prevention and control measures in accordance with current guidelines and best nursing practices.

### **Communication Skills**

At the end of the course, the student will be able to:

- Communicate clearly and appropriately with both specialist interlocutors (the healthcare team) and non-specialists (patients), using correct clinical and scientific terminology.
- Accurately and clearly record clinical and laboratory data in nursing documentation.

## **Making Judgements**

At the end of the course, the student will be able to:

- Recognize and assess clinical situations that require prompt intervention or reporting to the healthcare team.
- Demonstrate critical awareness in linking clinical data, laboratory findings, and nursing observations.
- Assess the risk of infection and adopt professional behaviours consistent with best safety practices.

## **Learning Skills**

At the end of the course, the student will be able to:

- Demonstrate the ability to engage in continuous learning in relation to new scientific evidence and best clinical and nursing practices.
- Independently integrate basic, pathophysiological, and clinical knowledge to manage complex care situations.

## **COURSE SYLLABUS**

### **Syllabus CLINICAL PATHOLOGY – IMMUNOLOGY, IMMUNOHAEMATOLOGY**

- Clinical value of the laboratory tests
- Blood collection, fractionation, and storage
- Complete blood count (CBC)
- The immune response: characteristics and cellular or molecular effectors
- Immunopathologies and their diagnosis
- Immunohaematology and transfusion medicine
- Inflammation biomarkers
- Evaluation of haemostatic capabilities
- Diagnostics of anaemias
- Liver function tests and jaundice
- Glycaemia
- Lipaemia
- Renal function tests and urinalysis.

### **Syllabus GENERAL PATHOLOGY - PATHOPHYSIOLOGY**

- Aetiopathogenesis: basic concepts (homeostasis, aetiology, pathogenesis, pathophysiology); chemical, physical or biological agents as aetiologic agents ; environmental and nutritional diseases.
- Cellular pathology: cellular adaptations (hyperplasia, hypertrophy, atrophy, metaplasia); cellular injury, reversible and irreversible cellular injury; cell death (necrosis and apoptosis).
- Inflammation: causes and signs of inflammation. Acute inflammation: circulatory changes, vascular changes, emigration of leukocytes, phagocytosis; different types of exudates. Mediators of inflammation. Systemic effects of inflammation. Chronic inflammation; granulomas. Healing and repair: tissue renewal, scarring, and fibrosis.

- Oncology: classification of tumours; biology of tumour cells; tumour progression and metastasis; causes of cancer; molecular basis of cancer ; hereditary cancer syndromes ; principles of antitumour therapy.
- Elements of pathophysiology of blood: anaemias, haemorrhagic disorders.
- Haemodynamic disorders: oedema, hyperaemia, haemorrhage, thrombosis, embolism, infarction, shock.
- Elements of cardiovascular pathophysiology: hypertension, atherosclerosis, cardiac failure.
- Elements of liver pathophysiology: jaundice, steatosis, hepatitis and cirrhosis; portal hypertension; liver failure.
- Diabetes mellitus: classification (type I, type II, gestational diabetes) ; pathogenesis and pathophysiology ; acute and chronic complications.
- Elements of renal pathophysiology: adaptations to renal damage; acute kidney injury; chronic kidney disease.

### **Syllabus MICROBIOLOGY AND CLINICAL MICROBIOLOGY**

- Characteristics of the main infection agents. Vital associations: commensalism, mutualism, parasitism. Associated microbial flora. Generalities on infectious diseases: infectious ratio, infection and disease, endogenous infection, exogenous infections, opportunistic infections.
- The bacterial cell: structure and essential functions. Gram negative and Gram positive. The bacterial spore. Cultivation of bacteria: growth and development of bacterial populations. Elements of bacterial genetics: mutations and mechanisms of genetic recombination. Principles of pathogenicity and virulence. Bacterial toxins: exotoxins and endotoxins. Mode of action of the main antibacterial drugs. Resistance to chemotherapy and antibiotics. Examples of bacteria of medical interest and associated diseases.
- Nature, methods of study and classification of viruses. Composition and architecture of the viral particle. Cultivation of viruses. Virus-cell relationship: productive infection, transforming infection. Virus-to-host relationships: acute, persistent, latent, slow infections. Pathogenic mechanisms in viral infections. Vaccines and basis of antiviral chemotherapy. Examples of viruses of medical interest and associated diseases.
- Habitat and morphology of fungi (yeasts, mycelial fungi). Fungal cell structure. Examples of fungi of medical interest and associated diseases.
- The protozoa cell: morphology and structure. Main characteristics of Helminths and Arthropods. Examples of parasites of medical interest and associated pathologies.

### **COURSE STRUCTURE**

The integrated course comprises a total of 84 hours of classroom instruction, distributed as follows: 42 hours for the General Pathology and Pathophysiology module, 28 hours for the Clinical Pathology, Immunology, and Immunohaematology module, and 14 hours for the Microbiology and Clinical Microbiology module. Classroom activities will be complemented by multimedia presentations, continuous assessment tests, and interactive case-based exercises designed to foster active student engagement and ensure the full attainment of the course's learning objectives.

## **FINAL ASSESSMENT AND EVALUATION**

The integrated final examination, covering the three modules of General Pathology and Pathophysiology, Clinical Pathology, and Microbiology and Clinical Microbiology, is conducted as a written test consisting of 20–30 multiple-choice questions per module (1 minute allowed per question). Each correct answer is awarded one point, and the resulting score for each module is converted to a 30-point scale. The final grade is determined as the weighted average of the module scores, proportionally to their ECTS credits. To pass the examination, students must correctly answer more than 50% of questions in each module and achieve a minimum weighted average score of 18/30. At the student's request, the exam may be supplemented by an oral test aimed at improving the final grade. During the oral test, one question per module will be asked, and assessment will take into account mastery of the subject matter, ability to apply knowledge to complex problems, and clarity of presentation.

The written test directly evaluates:

- knowledge and understanding, through questions assessing mastery of theoretical content;
- the ability to apply knowledge and understanding, through situational or case-based questions.

Other competencies—judgment, communication skills, and learning ability—are assessed indirectly through the student's selection of correct answers and critical interpretation of the questions in the written test, or directly in the oral test.

The exams will be evaluated according to the following criteria:

<b>&lt; 18</b> <b>insufficient</b>	Fragmented and superficial knowledge, with insufficient understanding of the topic. Errors in applying knowledge. Poor presentation and inappropriate use of technical-scientific language (in the case of an oral exam).
<b>18 - 20</b>	Barely sufficient knowledge and superficial understanding of the topics. Uncertainty in applying knowledge. Simple presentation and limited use of appropriate technical-scientific language (in the case of an oral exam).
<b>21 – 23</b>	Appropriate but not in-depth knowledge of the topic. Fair ability to apply knowledge. Acceptable presentation of content with sufficient use of appropriate technical language (in the case of an oral exam).
<b>24 – 26</b>	Good knowledge and understanding of the topics. Fair ability to apply knowledge. Ability to argue clearly and coherently, with good use of technical language (in the case of an oral exam).
<b>27 - 29</b>	In-depth knowledge of the topics, with strong analytical and synthetic skills. Ability to argue rigorously, with precise and appropriate use of technical language (in the case of an oral exam).
<b>30 - 30L</b>	Excellent mastery of the topics. Well-established ability to apply knowledge, with outstanding skills in analysis, synthesis, and making interdisciplinary connections.

Ability to argue in an innovative and original way, demonstrating deep understanding of concepts and impeccable use of technical language (in the case of an oral exam).

### **OPTIONAL ACTIVITIES**

Students will be received at the end of lectures or by appointment arranged via email.

In addition to classroom teaching, students will have the opportunity to participate in thematic seminars, research internships, clinical ward internships, and specialized monographic courses. These supplementary activities are intended to broaden the students' theoretical and practical training, but they are not subject to formal examination or evaluation.

### **READING MATERIALS**

#### **CLINICAL PATHOLOGY – IMMUNOLOGY, IMMUNOHAEMATOLOGY**

- Damjanov, I., Perry, A. M., & Perry, K. (2021). Pathology for the Health Professions-E-Book. Elsevier Health Sciences.
- Laposata's Laboratory Medicine Diagnosis of Disease in Clinical Laboratory 3rd Edition – LANGECC – McGraw Hill 2018.
- Slides and materials provided by the teacher.

#### **GENERAL PATHOLOGY - PATHOPHYSIOLOGY**

- Damjanov, I., Perry, A. M., & Perry, K. (2021). Pathology for the Health Professions-E-Book. Elsevier Health Sciences.
- Slides and materials provided by the teacher.

#### **Reading materials for MICROBIOLOGY AND CLINICAL MICROBIOLOGY**

- Richard A. Harvey, Pamela C. Champe, Bruce D. Fisher. Microbiology (fourth edition). Publisher: Wolters Kluwer Health.
- Slides and materials provided by the teacher.