



## Biomedical Laboratory Techniques

### **INTEGRATED COURSE: ONCOLOGY AND BLOOD DISEASES**

CFU: 11

SSD: MED/06, MED/15, MED/36

PROFESSOR: RIONDINO SILVIA E-MAIL: [silvia.riondino@unicamillus.org](mailto:silvia.riondino@unicamillus.org)

ATTENDANCE MODE: MANDATORY WITH AT LEAST 75% OF PRESENCE DURING THE INTEGRATED COURSE

MODULE: MEDICAL ONCOLOGY

CFU: 5

SSD: MED/06

PROFESSOR: RIONDINO SILVIA  
the students

e-mail: [silvia.riondino@unicamillus.org](mailto:silvia.riondino@unicamillus.org) to be agreed with

MODULE: BLOOD DISEASES, ONCOHEMATOLOGY:

CFU: 5

SSD: MED/15

PROFESSOR: FABIANI EMILIANO  
with the students

e-mail: [emiliano.fabiani@unicamillus.org](mailto:emiliano.fabiani@unicamillus.org) to be agreed

MODULE: DIAGNOSTIC IMAGING

CFU: 1

SSD: MED/36

PROFESSOR: BASSETTI ERICA  
the students

e-mail: [erica.bassetti@unicamillus.org](mailto:erica.bassetti@unicamillus.org) to be agreed with

### **PREREQUISITES**

- Knowledge of the general principles of medical terminology.
- Knowledge of normal human anatomy.
- Basic concepts concerning cellular structures and functions, nucleic acids (DNA and RNA), and protein manipulation.
- Basic principles of physiopathology
- Knowledge of the principles of biology and immunobiology of tumors, of the cellular and molecular pathogenetic mechanisms that lead from neoplastic transformation and growth to invasion and metastasis
- Knowledge of the principles of physics of ionizing and non-ionizing radiations.

### **LEARNING OBJECTIVES**

Students will need to know the predisposing conditions and the clinical characteristics of the various neoplastic diseases, prognostic and predictive factors related both to the neoplasm and to the patient, hematopoietic and lymphoid system and its physiopathological disorders. Moreover, students are asked to know the main laboratory analysis systems, the cellular isolation methods, standard molecular biology techniques commonly used in the oncohematological, how to store hematological samples, how to apply

diagnostic technologies required for diagnostic and prognostic assessment of hematological patients. Students will have to possess the notions and principles relating to Diagnostic Imaging (including interventional radiology) to integrate the knowledge of the professional profile with those relating to diagnostic imaging technologies. These objectives will be achieved through lectures aimed at improving students' learning capabilities in order to achieve useful skills for collaboration with multidisciplinary teams. These objectives will be verified through *in itinere* and final tests.

## **LEARNING OUTCOMES**

### **Knowledge and understanding**

At the end of the course, students must have gained knowledge and understanding in this field of study that represents a post-secondary level and an aptitude to understand not only advanced textbooks, but also some cutting-edge themes in their own field of studies dealt with during the entire educational path, along with the more advanced research protocols.

### **Applying knowledge and understanding**

At the end of the course, the students will be able to use the knowledge acquired for the in-depth study of aspects relating to their specific field in order to demonstrate a professional approach to their work, and to possess adequate skills to both devise, support and solve arguments and problems arising during working procedures and experimental protocols in full autonomy and in collaboration with the medical staff.

### **Communication skills**

At the end of the course, students should have acquired a specific scientific terminology and an independent critical judgment ability, especially in the analytical and clinical capacity of the results, in order to be able to communicate information, ideas, problems and solutions to specialist and non-specialist interlocutors, in a perspective of interdisciplinary mediation.

### **Making judgements**

At the end of the course, students must demonstrate their ability to manage the acquired knowledge and their ability to collect and interpret data deemed useful for integrating and applying knowledge to clinical reasoning related to the approach to patients, formulating independent judgments. This will make them independent even from the point of critical judgment on social, scientific or ethical issues related to them.

## **COURSE SYLLABUS**

### **Syllabus MEDICAL ONCOLOGY**

- Epidemiology of cancer and prevention
- Prognostic and predictive risk factors
- Carcinogenesis, cancer growth and proliferation, cancer immune tolerance
- Assessment and investigations of patients with cancer, including history, physical examination, laboratory and imaging techniques. Performance Status Evaluation (Karnofsky and ECOG scores)
- Tumour staging



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- Principles of therapy of oncological diseases and clinical effects of therapeutic approaches used: Surgery, radiotherapy, cytotoxic approach (neoajuvant, adjuvant, metastatic and palliatives approaches), target therapy and immune anti-cancer agents. Drug resistance
- Management of medical emergencies and complications resulting from cancer or its treatment.
- Response Evaluation Criteria In Solid Tumours (RECIST)
- Clinical Trials and the future of research in Oncology

### **Syllabus BLOOD DISEASES AND ONCOHEMATOLOGY**

- Bone marrow nice
- Haematopoietic stem cell
- Haematopoiesis
- Anemia
- Clonal haematopoiesis
- Myelodysplastic syndrome
- Acute myeloid leukaemia
- Acute lymphoblastic leukaemia
- Myeloproliferative disorders
- Chronic myeloid leukaemia
- Lymphoma
- Peripheral blood sampling and bone marrow aspirate
- Haematological cell culture technics
- Peripheral blood and bone marrow smear
- Isolation of mono and polymorphonuclear cells
- Stem cell isolation: culture, amplification and cryopreservation
- Cytofluorimetry
- Karyotype aberrations: conventional and molecular cytogenetics (FISH)
- Diagnostic and prognostic role of molecular biology in oncohaematology
- Extraction and storage of nucleic acids (DNA and RNA) for haematological tests
- Basic techniques in molecular biology: nucleic acids amplification
- Qualitative analysis (PCR and RT-PCR), diagnostic approach
- Minimal residual disease
- Qualitative analysis (PCR and RT-PCR), prognostic approach
- Gene mutations
- Sanger sequencing
- New generation sequencing and personalized medicine: applications, progress, costs and benefits

## **Syllabus DIAGNOSTIC IMAGING**

- General principles of ionizing and non-ionizing radiation
- Diagnostic imaging equipment
- Conventional radiology equipment overview of the equipment and their use
- Computed Tomography equipment overview of the equipment and their use
- Radiology equipment for panoramic interventional radiology applications of equipment and their use
- Radiology equipment for panoramic radiotherapy applications of equipment and their use
- Evaluations on the dose to be administered to the patient
- Targeted choice of the exam to be carried out based on the clinical problem
- Dose / benefit ratio
- Elements of multidisciplinary radiological anatomy

## **COURSE STRUCTURE**

Frontal and interactive lessons with the aid of slides and continuous verification of the students' preparation and learning status. Journal club and discussion of clinical cases will be used to demonstrate the practical application of what has been learned.

## **COURSE GRADE DETERMINATION**

The integrated teaching exam consists of an oral and write exam, during which the commission will assess the student's ability to apply the knowledge learned and will ensure that the skills are adequate to solve the problems that arise in the specific disciplinary field and taking I also take into account the objectives of the teaching. The exam can be passed with a grade of 18/30. The student's learning ability, judgment ability and communication skills will be assessed. In the evaluation, knowledge and understanding have a weight of 50%, knowledge and understanding of 20% and autonomy of judgment of 30%

The student can take the exam in a single session in the recovery session (September / January), while the exam can be taken in two separate sessions in the ordinary sessions (February / July)

The assessments can be carried out both in progress and at the end of the integrated course. The methodology will be communicated at the beginning of the lessons together with the bibliography and / or teaching materials necessary for the preparation for the final evaluation.

• Oral exam: It will focus on questions concerning the study programs. It will evaluate the student's ability to have acquired the knowledge related to the contents of the courses and their integrations, and will ascertain the appropriate use of terminology.

- Written test: It will focus on the programmed topics of the courses that make up the integrated course.

The exam will be assessed according to the following criteria:

**Not suitable:** Poor or lacking knowledge and understanding of the topics; limited capacity for analysis and synthesis, frequent generalizations of the requested contents; inability to use technical language.

**18-20:** Just enough knowledge and understanding of the topics, with obvious imperfections; just sufficient capacity for analysis, synthesis and autonomy of judgment; poor ability to use technical language.

**21-23:** Sufficient knowledge and understanding of the topics; sufficient ability to analyze and synthesize with the ability to reason with logic and coherence the required contents; sufficient ability to use technical language.

**24-26:** Fair knowledge and understanding of the topics; discrete ability to analyze and synthesize with the ability to rigorously argue the required contents; good ability to use technical language.

**27-29:** Good knowledge and understanding of the required contents; good ability to analyze and synthesize with the ability to rigorously argue the required contents; good ability to use technical language.

**30-30L:** Excellent level of knowledge and understanding of the required content with an excellent ability to analyze and synthesize with the ability to argue the required content in a rigorous, innovative and original way; excellent ability to use technical language.

## OPTIONAL ACTIVITIES

## READING MATERIALS

### MEDICAL ONCOLOGY

- Chmielowski B., Territo M.C. Manual of Clinical Oncology. Ed: Lippincott Williams and Wilkins. ISBN 9781496349576
- The slides and the articles shown during the course will be made available to the student and will constitute the reading material for the course of Medical Oncology

### BLOOD DISEASES, ONCOHEMATOLOGY

- Hematology: pathophysiology, diagnosis and treatment. Sante Tura, Michele Cavo e Pier Luigi Zinzani. Casa editrice Esculapio.
- The slides shown during the course will be made available to the student and will constitute the reading material for the haematological diagnostic techniques.



## **DIAGNOSTIC IMAGING**

- Compendio di Radiologia R. Passariello, G. Simonetti
- The slides and the articles shown during the course will be made available to the student and will constitute the reading material for the course of Diagnostic Imaging