

Degree in Biomedical Laboratory Techniques

INTEGRATED TEACHING: MEDICAL ONCOLOGY AND BLOOD DISEASES

CREDITS: 11

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

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

MODULE: /MEDICAL ONCOLOGY

CREDITS: 5

SSD: MED/06

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MODULE: BLOOD DISEASES, ONCOHEMATOLOGY:

CREDITS: 5

SSD: MED/15

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MODULE: DIAGNOSTIC IMAGING

CREDITS: 1

SSD: MED/36

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PREREQUISITI

- 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
- 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 niche
- 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

Course grade determination will take place by means of intermediate monitoring of learning which do not constitute separate marks but which make up the final grade (which is the only one to be recorded). In the case of written tests, these will consist of 30 multiple choice questions, for each correct answer a point will be assigned to the final score. Marks will be expressed in thirtieths. The following descriptors will also be assessed: making judgments, communication skills and learning skills as indicated in the Dublin descriptors. In this light, knowledge and comprehension skills have a weight equal to 35%, applied knowledge and comprehension skills of 35%, judgment autonomy of 20% and communication skills of 10%. The result will be communicated to the student after the collegial assessment of the Integrated Course, established according to the following criteria:

Not suitability: important shortcomings and/or inaccuracy in the knowledge and understanding of the topics; limited analysis and synthesis skills, frequent generalizations.

18-20: Knowledge and understanding of the topics is just sufficient.

21-23: Discreet Knowledge and understanding of the topics.

24-26: Good knowledge and understanding of the topics.

27-29: Full knowledge and understanding of the topics.

30-30L: Excellent level of knowledge and understanding of the topics.

For scores of less than 18 (non-suitability): the exam must be repeated in a subsequent call.

In the evaluation, knowledge and comprehension skills have a weight of 50%, applied knowledge and understanding skills of 20% and independent judgment of 30%

OPTIONAL ACTIVITIES

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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