1. OVERVIEW

Subject Area	Haematology
Degree	MEDICINE
School/Faculty	BIOMEDICAL AND HEALTH SCIENCES
Ac. Year	THREE
ECTS	7 ECTS
Type	COMPULSORY
Language(s)	SPANISH
Delivery Mode	ON CAMPUS
Semester	Six-monthly

2. INTRODUCTION

This is a compulsory subject belonging to the Human Clinical Training module III. This module consists of 174 ECTS in clinical training and 72 ECTS in clinical placements. Human Clinical Training brings together all the knowledge, skills and attitudes students acquire throughout the degree programme. The Haematology subject consists of 3.5 ECTS and 3.5 ECTS in clinical placements. To take this course, students must have passed at least 150 ECTS in the first three years.

The aim of this subject is for students to acquire the knowledge of the aetiology, symptomatology, diagnosis, prognosis and prevention of haematological system diseases.

3. SKILLS AND LEARNING OUTCOMES

Basic Skills (CB, as per the Spanish acronym):

- CB2: Students can apply their knowledge to their work professionally and possess the necessary skills, usually demonstrated by forming and defending opinions, as well as resolving problems within their study area.
- CB3: Students will develop an ability to gather and interpret relevant data (usually within their study area) to form opinions which include reflecting on relevant social, scientific or ethical matters.
- CB4: Students can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences.
- CB5: Students will develop the learning capacity required to undertake subsequent study with a high degree of autonomy.

General skills (CG, by the acronym in Spanish):

- CG1. Recognise the essential parts of being a medical professional, including ethical principles and legal responsibilities, together with how to provide a patient-centred service.
- CG2. Understand the importance of such principles to benefit patients, society and the profession, with particular attention paid to professional secrecy, confidentiality and intimacy.
- CG3. Know how to apply the principle of social justice to professional practice.

- CG4. Develop professional practice taking into account patient autonomy, beliefs and culture.
- CG5. Be aware of the need to maintain and update professional skills, paying special attention to continuous self-learning of emerging knowledge and to discover new products and techniques with the aim of improving quality.
- CG6. Carry out professional activity with regard to other health professionals.
- CG9. Understand and recognise the effects, mechanisms and manifestations of a disease on the structure and functioning of the human body.
- CG10. Understand and recognise the causal agents and risk factors which determine health conditions and the development of a disease.
- CG12. Understand the principles of action, indications and effectiveness of therapeutic interventions, based on the available scientific evidence.
- CG13. Obtain and elaborate a clinical history report with all relevant information.
- CG14. Perform a physical examination and mental health assessment.
- CG15. Have the ability to carry out an initial diagnosis and establish a well-founded approach to making a diagnosis.
- CG17. Establish the diagnosis, prognosis and treatment, applying the principles based on the most reliable information possible.
- CG18. Indicate the most suitable therapy for the most common acute and chronic processes, including patients in the terminal phase.
- CG19. Raise and propose the suitable preventative measures required for each clinical situation.
- CG20. Acquire sufficient clinical experience under supervision in hospital institutions, health centres or other healthcare institutions.
- CG21. Listen attentively, obtain and synthesise information regarding the problems troubling the patient and understand this information.
- CG22. Write clinical histories and other medical records in a way so they can be understood by other people.
- CG23. Communicate effectively and clearly, both orally and in writing, with patients, family members, media and other professionals.
- CG24. Establish good interpersonal communication which allows you to efficiently and empathetically connect with patients, family members, media and other professionals.
- CG26. Assume a role in the prevention and protection against diseases, injuries or accidents, together with the maintenance and promotion of health, both on an individual and community level.
- CG32. Know how to use information and communication technology in clinical, therapeutic, preventative and research activity.

Cross-curricular skills (CT, by the acronym in Spanish):

- CT1. Communication: ability to engage in active listening, ask questions and respond in a clear and concise way, as well as to effectively express ideas and concepts. This includes concise and clear written communication.
- CT2. Leadership: ability to offer ideas, approaches and interpretations through strategies which offer solutions to real-life problems.
- CT3. Teamwork: ability to integrate and collaborate actively with other people, areas and/or organisations to reach common goals, evaluate and integrate contributions from the rest of the group members and create a good working environment.
- CT4. Adaptability: ability to detect, interpret and respond to a changing environment. Ability to

equip themselves and work effectively in different situations and/or with different groups or individuals. This means adapting to change depending on circumstances or needs. It involves the confidence to take on crucial challenges on a personal or group level, maintaining a good physical and mental health to allow work to be carried out effectively.

- CT5. Initiative: ability to undertake difficult or risky actions with resolve.
- CT6. Problem solving: ability to solve an unclear or complex issue or situation which has no established solution and requires skill to reach a conclusion.
- CT7. Decision making: ability to choose between different options or methods to effectively solve different problems or situations.
- CT8. Planning and organization: ability to set objectives and choose the right means to fulfil them through the efficient use of time and resources.
- CT9. Ability to put knowledge into practice, using the skills acquired in the classroom to mock situations based on real life experiences that occur in the relevant profession.
- CT10. Independent learning: the ability to govern your own development by choosing the most effective lines of action, strategies, tools and opportunities to independently learn and apply knowledge to practice.

Specific skills (CE, by the acronym in Spanish):

- CE 3.1.2: Recognise, diagnose and direct treatment of the main blood pathologies.
- CE 3.2.1: Know how to do a full anamnesis focused on the patient and with a view to diverse pathologies, interpreting its meaning.
- CE 3.2.2: Know how to perform a physical examination of the systems and apparatus, as well as a psychopathological assessment, being able to interpret the results.
- CE 5.1.1 Complete a student work placement, involving independent clinical rotation and a final skills assessment in health centres, hospitals and other care facilities, which allows students to incorporate professional values, healthcare communication skills, clinical reasoning, clinical management and critical judgement. This also requires students to familiarise themselves with the most common health problems in Medicine, Surgery, Obstetrics and Gynaecology, Paediatrics, Psychiatry and other clinical areas.

Learning outcomes (RA, by the acronym in Spanish):

- Recognise the most common pathologies of the haematopoietic system: polycythaemia, anaemic syndrome, leukocyte alterations, bleeding diathesis, disorders of the lymphatic system, haematological neoplasms and other important haematological pathologies.
- Diagnose the most common pathologies of the haematopoietic system: clinical history and physical examination focusing on the haematopoietic system pathology, suitability and interpretation of the main complementary diagnostic tests (haemogram, peripheral blood smear test, total protein test, haemostasis tests, iron tests, plus other laboratory tests, image tests, anatomical pathology tests, etc.).
- Direct the medico-surgical treatment of the most common haematological diseases.

The following table shows how the skills developed in the subject area match up with the intended learning outcomes:

Skills	Learning outcomes
CB2, CB 5, CG1, CG 2, CG3, CG4, CG5, CG6, CG9, CG 10, CG20, CG21, CG22, CG23,	Recognise the most common pathologies of the haematopoietic system: polycythaemia, anaemic syndrome, leukocyte alterations, bleeding diathesis,

CG24, CG26, CG32, CT9, CT10, CE 3.1.2, CE 5.1.1	disorders of the lymphatic system, neoplasms and other important haematological pathologies.
CB3, CB 5, CG1, CG 2, CG3, CG4, CG5, CG6, CG 13, CG14, CG15, CG 17, CG20, CG21, CG22, CG23, CG24, CG26, CG32, CT1, CT3, CT4, CT5, CT6, CT7, CT8, CT9, CT10, CE 3.1.2, CE 3.2.2, CE 5.1.1	Diagnose the most common pathologies of the haematopoietic system: clinical history and physical examination focusing on the haematopoietic system pathology, suitability and interpretation of the main complementary diagnostic tests (haemogram, peripheral blood smear test, total protein test, haemostasis tests, iron tests, plus other laboratory tests, image tests, anatomical pathology tests, etc.).
CB4, CB 5, CG1, CG 2, CG3, CG4, CG5, CG6, CG 12, CG 18, CG19, CG20, CG21, CG22, CG23, CG24, CG26, CG32, CT2, CT4, CT5, CT6,CT7, CT8, CT9, CT10, CE 3.2.2, CE 3.1.2, CE 3.2.1, CE 5.1.1	Direct the medico-surgical treatment of the most common haematological diseases.

4. CONTENTS

HAEMATOLOGY	
Topic 1.	Introduction to haematology. Structure and function of the haematopoietic organs: haematopoyesis. Morphology and erythrocytes, granulocytes, monocytes, lymphocytes and platelets.
Topic 2.	Iron metabolism disorders: iron deficiency anaemia. Haemochromatosis. Congenital sideroblastic anaemias.
Topic 3.	Megoblastic anaemias. Anaemia associated to chronic disorders. Multifactorial mechanism anaemias (anaemias associated to chronic diseases). Congenital dyserythropoietic anaemia.
Topic 4.	Disorders of haemoglobin synthesis. Structural haemoglobinopathies. Thalassaemia/thalassaemic disorders. Porphyria.
Topic 5.	Haemolytic anaemias I: concepts, general aspects and classification. Congenital haemolytic anaemias: membranopathies, enzymopathies.
Topic 6.	Acquired haemolytic anaemias II: AIHA. Non-immune haemolytic anaemia (mechanical, MAHA). Thrombotic thrombocytopenic purpura. Haemolytic uremic syndrome.
Topic 7.	Non-neoplastic alterations of the multipotent haematopoietic stem cells: classification. Bone marrow failure. Paroxysmal nocturnal haemoglobinuria.
Topic 8.	Neutropenia, neutrophils, agranulocytosis. Functional alterations of the granulocytes.
Topic 9.	Pathology of the mononuclear phagocyte system: histiocytosis, haemophagocytic syndromes, storage disorders.
Topic 10.	Drugs and therapeutic approach in onco-haematology.
Topic 11.	General aspects of chronic myeloproliferative neoplasms: polycythaemia vera, secondary polycythaemia.
Topic 12.	Chronic myeloproliferative disorders/neoplasms: chronic myelogenous leukaemia. Essential thrombocythaemia.
Topic 13.	Chronic myeloproliferative disorders/neoplasms. Primary/idiopathic myelofibrosis. Eosinophilia and eosinophilic disorders. Mastocystosis.
Topic 14.	Myelodysplastic syndromes. Myelodysplastic/myeloproliferative syndromes (intermediate clinical picture).
Topic 15.	Acute leukaemia: definition, general aspects and classifications/types. Acute myeloid leukaemia.
Topic 16.	Acute lymphoid leukaemia.

Topic 17.	Classification of lymphocyte diseases. Lymphocytosis and lymphopenia. Immunodeficiency. Mononucleosis syndromes. Lymphadenopathy syndrome.
Topic 18.	Chronic lymphoproliferative syndromes. Chronic lymphocytic leukaemia. Other lymphoproliferative disorders: with leukaemic expression: hairy cell leukaemia, prolymphocytic leukaemia, among others).
Topic 19.	Lymphomas: general aspects, classifications, diagnostic studies, prognostic indicators.
Topic 20.	Indolent B-cell NHL. Cutaneous lymphoma.
Topic 21.	Aggressive B-cell NHL.
Topic 22.	Hodgkin lymphoma.
Topic 23.	Monoclonal gammopathy: general aspects, diagnostic studies. Classification. Monoclonal gammopathy of undetermined significance. Multiple myeloma.
Topic 24.	Other monoclonal gammopathies: Waldenström macroglobulinaemia, primary amyloidosis, heavy chain diseases, monoclonal cryoglobulinaemia, POEMS syndrome.
Topic 25.	Haematopoietic transplant: definition and general aspects.
Unit 24.	Physiology of clotting. Clinical and laboratory exploration of haemostasis. Classification of haemostasis disorders.
Topic 27.	Platelet alterations: thrombocytopenia, thrombocytosis, thrombocytopathies. Vascular purpura.
Topic 28.	Coagulation alterations: congenital and acquired coagulopathies.
Topic 29.	Thrombosis and hypercoagulability. States of thrombophilia/hypercoagulability. Prophylaxis and antithrombotic treatment: anti-aggregants, anticoagulants and fibrinolytics.
Topic 30.	Blood transfusion: immunology basics (immunohaematology). Blood groups. Obtaining, preservation and clinical use of haemoderivatives. Cytapherisis and plasmapherisis procedures.

5. TEACHING/LEARNING METHODS

The types of teaching/learning methods are as follows:

- Problem-based learning: Presentation of problems, reorganising into small groups, literature analysis, analysis of scientific texts and documents, symposiums and presentations, directed debates, specialised individual and collective tutorials, and reaching a consensus.
- Problem-based learning: Presentation of problems, reorganising into small groups, literature analysis, analysis of scientific texts and documents, symposiums and presentations, directed debates, specialised individual and collective tutorials, and reaching a consensus.
- Case studies and problem solving: approach and solving cases and problems either as an individual or in small groups.
- Specialised seminars: literature research and debate on scientific data in small groups.
- Lectures: classroom presentations by the professor on basic theory, encouraging debate and student participation.
- Case study method: presentation and discussion of clinical cases in small groups.
- Learning in skills workshops and simulation scenarios: practical work with IT programs, anatomical models, human dissection and standardised patients.
- Experiential learning in supervised clinical placements in the different hospital services: problem-solving in a practical context observing the tutor, being observed by the tutor, or with the tutor's supervision. Students will integrate themselves and participate in the activities performed in the healthcare units. The student activities will be programmed, tutor-assisted and assessed by the tutor.

6. LEARNING ACTIVITIES

The types of learning activities, plus the amount of time spent on each activity, are as follows:

On campus:

Learning activity	Number of hours	Attendance mode
Theory/practical learning activities on-campus	32h	100
Directed learning activities	10h	20
Independent working	25h	0
Clinical placements	100h	100
Tutorials	6h	100
Knowledge tests	2h	100

7. ASSESSMENT

The assessment methods, plus their weighting in the final grade for the subject area, are as follows:

On campus:

	Assessment system	Weighting
THEORY (50%)	Continuous assessment	10%
	Final assessment exam	40%
PRACTICAL PART (50%)	Attitude (rubric)	5%
	Clinical practice (rubric)	20%
	ECOE	25%

On the Virtual Campus, when you open the subject area, you can see all the details of your assessment activities and the deadlines and assessment procedures for each activity.

8. BIBLIOGRAPHY

The reference work for the follow-up of the subject is:

Haematology:

- Pregrado de Hematología Ed. 2017, Moraleda. Acceso abierto a través de la web de la Sociedad Española de Hematología y Hemoterapia (SEHH): http://www.sehh.es/images/stories/recursos/2017/10/Libro-HEMATOLOGIA- Pregrado.pdf

- For clinical practices: Free app: Manual práctico de Hematología Clínica. Miguel A. Sanz y Enric Carreras. Fundación J. Carreras. AMGEN

Recommended bibliography is indicated below:

- **PROMIR**

- García Gutiérrez JV, Tenorio MC PROMIR: Hematología 2022-2023, 2ª ed. Madrid: Editorial Médica Panamericana; 2022.