SUBJECT OUTLINE
Immunophenotyping in immunology and in the diagnosis of hematological diseases

1. Programme of study description

1.1.	**THE "CAROL DAVILA" UNIVERSITY OF MEDICINE AND PHARMACY**
1.2.	**THE FACULTY OF MEDICINE / THE CLINICAL DEPARTMENT**
1.3.	**DISCIPLINE**
1.4.	**DOMAIN OF STUDY: Healthcare – regulated sector within the EU**
1.5.	**CYCLE OF STUDIES: BACHELOR'S DEGREE**
1.6.	**PROGRAMME OF STUDY: MEDICINE**

2. Subject description

2.1.	**Name of the subject/compulsory subject/elective subject within the discipline: MCS-HEMATOLOGIE (CLINICĂ ŞI DE LABORATOR) SUUB**
2.2.	**Location of the discipline: Spitalul Universitar de Urgenta Bucuresti**
2.3.	**Course tenured coordinator:** PROF. UNIV. DR. BUMBEA HORIA (53 ani, vechime activitate didactică – 21 ani) SEF LUCR. DR. CIUFU CRISTINA MARIA (46 ani, vechime activitate didactică – 13 ani)
2.4.	**Titularul activităților de Lp / stagiu clinic:** SEF. LUCR. DR. MARINESCU CRISTINA ELENA (46 ani, vechime activitate didactică – 14 ani) ASIST UNIV. DR. DIACONESCU DANIELA (30 ani, vechime activitate didactică – 2 luni)

2.5. Year of study	III	**2.6. Semester**	I or II	**2.7. Type of assessment**	Theoretical exam	**2.8. Subject classification**	Obligatory DS

3. Total estimated time (hours/semester of didactic activity) – teaching module

Number of hours per week	14	**Out of which: course**	12	Clinical rotation	2
Total number of hours from curriculum	14	**Out of which: course**	**12**	Clinical rotation	2
Distribution of allotted time	**1 week**	**Out of which: course**	2 h/day	Clinical rotation	0,5 Hour/day

Study from textbooks, courses, bibliography, and student notes	
Additional library study, study on specialized online platforms and field study	
Preparing seminars / laboratories, assignments, reports, portfolios and essays	
Tutoring	
Examinations	
Other activities	
Total hours of individual study	
Number of credit points	4

4. Prerequisites (where applicable)

4.1. of curriculum	Anatomie, Biochimie, Fiziologie, Genetica, Farmacologie, Semiologie Medicală
4.2. of competencies	History / clinical examination of patient

5. Requirements (where applicable)

5.1. for delivering the course	Classroom, videoprojector, PC
5.2. for delivering the clinical rotation	Clinical department, stem cell lab

6. Acquired specific competencies

Professional competencies (expressed	- Description of concepts, theories, and fundamental

through knowledge and skills)	notions regarding the production of diseases, the signs and symptoms characteristic of each condition useful for guiding laboratory diagnosis in hematology and immunology - Immunophenotypic diagnostic algorithm in hemopathies - Interpretation of results - Establishing a hematological diagnosis, on clinical and paraclinical bases
Transversal competencies (of role, of professional and personal development)	He has theoretical knowledge about the flow cytometry me applications in hematology and immunology Establishes paraclinical and diagnostic investigation schem interprets the results of investigations - (medulogram, immunophenotyping, karyotype) Briefly interprets the specific immunophenotyping analysis by flow cytometry

7. Subject learning objectives (based on the scale of acquired specific competencies)

7.1. General learning objective	- Familiarization of the student with the applications of flow cytometry in hematology
7.2. Specific learning objectives	At the end of the internship, the student must be able to: - know the principle of the flow cytometry method - knows the applications of the method in hematology and immunology

8. Content

8.1. Course	**Teaching methods**	**Observations**
Course 1. History. The fluidic principles of flow cytometry. The working principle of the flow cytometer. Types of flow cytometers. Fluorochromes. Photoreceptors. Monoclonal antibodies. Conjugation with fluorochromes. Sorting by flow cytometry.	Direct exposure electronic support (Power Point presentation)	2 h
Course 2. Flow cytometry in hematology. Immunological classifications of malignant hemopathies. Diagnosis of acute leukemias	Direct exposure electronic support (Power Point presentation)	2 h
Course 3 Diagnosis of chronic lymphoproliferative disorders	Direct exposure electronic support (Power Point presentation)	2 h
Course 4 The study of lymphocytic subpopulations. Applications in immunology	Direct exposure electronic support (Power Point presentation)	2 h
Course 5 DNA content study. Diagnosis of paroxysmal nocturnal hemoglobinuria (PNH)	Direct exposure electronic support (Power Point presentation)	2 h
8.2. Clinical rotation	**Teaching methods**	**Observations**

Direct exposure of clinical cases / patients with hematological diseases admitted to the Departments of Hematology and the Bone Marrow Transplantation department	Direct interaction with patients / medical history / Patient clinical examination / Evaluation of laboratory samples / Recognition of hematological disorders based on specific investigations.	4 h

Bibliography for course and clinical rotation

Flow Cytometry in Hematopathology, Nguyen Doyen T., Springer, 2007
Practical Haematology; Dacie and Lewis; Eleventh Edition, 2012
Essential Haematology; Victor Hoffbrand , Paul Moss , John Pettit, 7th Edition (2016)

9. Corroboration of the subject content with the expectations of the representatives of the epistemic community, professional associations, and major employers in the field of the programme of study

10. Assessment

Type of activity	Assessment criteria	Assessment methods	Assessment weighting within the final grade
Course	Knowledge of the theoretical notions of the subject	Theoretical exam 10 subjects	60%
Clinical rotation	Activity during the clinical internship	Condition attendance / discussions with the group assistant	10%
	- immunophenotyping indication orientation	Practical exam with the group assistant / teacher	30%

Minimum performance standard

Minimum 50% in each component of the assessment

Date of filing	Signature of the course tenured coordinator	Signature of the seminar tenured coordinator
30 March 2023	**According to the state of functions**	**According to the state of functions**

Date of approval in the Council of the Department:

Signature of the Head of the Department

Prof. Univ. Dr. Horia Bumbea Prof. Univ. Dr. Daniel Coriu