



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ

HELLENIC REPUBLIC

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ΕΘΝΙΚΗ ΑΡΧΗ ΑΝΩΤΑΤΑΤΗΣ ΕΚΠΑΙΔΕΥΣΗΣ

HELLENIC AUTHORITY FOR HIGHER EDUCATION

## **University of West Attica**

**School of Health and Care Sciences**

**Department of Biomedical Sciences**

### **Postgraduate Studies**

#### **“Biomedical Methods and Technology in Diagnosis”**

Course Outline

**PATHOPHYSIOLOGY OF THE ERYTHROCYTE – TRANSFUSION THERAPY AND PROTEOMICS**



ATHENS 2023

## COURSE OUTLINE

### (1) GENERAL

SCHOOL	School of Health and Care Sciences		
ACADEMIC UNIT	Biomedical Sciences		
LEVEL OF STUDIES	Postgraduate Studies		
COURSE CODE	IA5	SEMESTER	First
COURSE TITLE	PATHOPHYSIOLOGY OF THE ERYTHROCYTE – TRANSFUSION THERAPY AND PROTEOMICS		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Review of existing literature		4	8
Experimental procedure			
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Skills development Special background-general knowledge specialization		
PREREQUISITE COURSES:	HEMATOLOGY, BLOOD DONATION		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO		
COURSE WEBSITE (URL)	<a href="https://eclass.uniwa.gr/courses/DML104/">https://eclass.uniwa.gr/courses/DML104/</a>		

### (2) LEARNING OUTCOMES

<p><b>Learning outcomes</b></p> <p><i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> <li>• <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i></li> <li>• <i>Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i></li> <li>• <i>Guidelines for writing Learning Outcomes</i></li> </ul>
<p><b>Purpose and Educational Objectives:</b> At the end of the course, the students will have the necessary learning skills that allow them to know in depth the red blood cells, both in terms of structure and function, as well as, in pathology. Learning about anemias and current issues in transfusion therapy is critical. The students will gain the ability to synthesize knowledge and handle complex topics related to red blood cell transfusion. The aim of the course is students to know the structure and functions of the red blood cell, the laboratory investigation of anemias and the cutting-edge techniques of proteomics and metabolomics. Also, after successfully attending the course, students will know up-to-date issues of transfusion medicine and blood donation.</p>

### General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology  
Adapting to new situations  
Decision-making  
Working independently  
Team work  
Working in an international environment  
Working in an interdisciplinary environment  
Production of new research ideas

Project planning and management  
Respect for difference and multiculturalism  
Respect for the natural environment  
Showing social, professional and ethical responsibility and sensitivity to gender issues  
Criticism and self-criticism  
Production of free, creative and inductive thinking  
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Others...  
.....

- Search, analysis and synthesis of data and information, using the necessary technologies
- Adaptation to new situations in the current hematology laboratory
- Autonomous work
- Teamwork
- Work in an interdisciplinary environment

### (3) SYLLABUS

1. Introduction to red blood cell pathophysiology and transfusion practices
2. Up-to-date methodology of Blood Donation
3. Non-Infectious Complications of Blood Transfusion
4. Immunohematology laboratory of Blood Donation (A)
5. Changes in erythrocyte structure and function in patients with chronic kidney failure
6. Immunohematology laboratory of Blood Donation (B)
7. Platelet and granulocyte antigens and antibodies
8. Red cell storage damage
9. Hematopoietic stem cells – Umbilical cord graft. Tissue engineering and regenerative medicine
10. Structure, function, and mechanisms of red blood cell clearance
11. Neonatal and Pediatric Transfusion Practice
12. Pathophysiology and diagnosis of hereditary membrane diseases
13. The contribution of holistic methodologies (with an emphasis on proteomics and metabolomics) in Blood Donation and Transfusion Therapy. [A]
14. The contribution of holistic methodologies (with emphasis on proteomics and metabolomics) in Blood Donation and Transfusion Therapy. [B]

#### Laboratory/Tutorial Exercises

1. Detection of erythrocyte antigens by flow cytometry.
2. Testing of erythrocyte antigens, techniques (gel tubes).
3. Process of erythrocyte cross-linking.
4. Removal of erythrocyte antibodies. Elution of warm and cold anti-erythrocyte antibodies. Identification and titration of antierythrocyte antibodies

#### (4) TEACHING and LEARNING METHODS - EVALUATION

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	In the classroom and in the Lab face to face.	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	Video recording and/or simulation of Molecular Histopathology - Oncology techniques	
<b>TEACHING METHODS</b> <i>The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.  The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	<b>Activity</b>	<b>Semester workload</b>
	Lectures	45
	Laboratory/Tutorial	45
	Exercises	
	Writing Assignment	30
	Specialized seminars	30
	Writing Assignment	50
	<b>Course total</b>	<b>200</b>
<b>STUDENT PERFORMANCE EVALUATION</b> <i>Description of the evaluation procedure  Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other  Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	<ol style="list-style-type: none"> <li>Written final exam (100%) which includes: <ul style="list-style-type: none"> <li>Multiple choice questions</li> <li>Short answer questions</li> <li>Written exam in a selected thematic section</li> <li>Laboratory work in techniques</li> </ul> </li> </ol>	

#### (5) ATTACHED BIBLIOGRAPHY

<p>Suggested bibliography:</p> <p><b>Greek</b></p> <ol style="list-style-type: none"> <li>Ιατρική των Μεταγγίσεων, Α. Καλλινίκου-Μανιάτη, Ιατρικές Εκδόσεις Παρισιάνου ΑΕ, 2002.</li> </ol> <p><b>Foreign</b></p> <ol style="list-style-type: none"> <li>Standards for Blood Banks and Transfusion Services, 29<sup>th</sup> edition, American association of blood banks.</li> <li>Blood Transfusion Therapy: A Physician's Handbook, 10<sup>th</sup> edition, American association of blood banks.</li> <li>Guidelines for Patient Blood Management and Blood Utilization, American association of blood banks.</li> <li>Transfusion Reactions, 4<sup>th</sup> edition, 10<sup>th</sup> edition, American association of blood banks.</li> <li>Decision Making in Transfusion Medicine, 10<sup>th</sup> edition, American association of blood banks.</li> </ol> <p>- Related academic journals:</p> <ol style="list-style-type: none"> <li>Blood</li> <li>Blood transfusion</li> <li>Transfusion</li> <li>European journal of hematology</li> <li>Transfusion medicine</li> <li>Blood cells molecules and diseases</li> <li>American journal of blood research</li> <li>Blood research</li> <li>Blood reviews</li> </ol>
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