

MODULE OUTLINE

(1) GENERAL INFORMATION

SCHOOL	School of Science and Technology		
PROGRAM COURSE	Precision Medicine and Novel Therapies (PRETH)		
LEVEL OF STUDY	Postgraduate		
MODULE CODE	PRETH50	YEAR OF STUDY	1 st (1 st semester)
MODULE TITLE	Biomarkers in Precision Medicine		
INDEPENDENT TEACHING ACTIVITIES <i>in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits</i>	WEEKLY TEACHING HOURS	CREDITS	
Hours per week (28-29 hours) x 13 weeks	375	15 ECTS	
<i>Add rows if necessary. The organization of teaching and the teaching methods used are described in detail under section 4</i>			
MODULE TYPE Compulsory, Optional, Optional mandatory	Compulsory		
PREREQUISITE MODULES:	No		
LANGUAGE OF INSTRUCTION AND EXAMS:	English		
THE MODULE IS OFFERED TO ERASMUS STUDENTS	Yes		
MODULE WEBSITE (URL)	https://www.eap.gr/en/preth/ Each module has its own space in the Learning Management System of EAP, with controlled access (use of code) for students and teaching staff. https://courses.eap.gr/course/view.php?id=254		

(2) LEARNING OUTCOMES

<p>Learning Outcomes</p> <p>The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult: <u>APPENDIX A</u></p> <p>Description of the level of learning outcomes for each level of study, in accordance with the European Higher Education Qualifications' Framework.</p> <p>Descriptive indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and <u>APPENDIX B</u></p> <p>Guidelines for writing Learning Outcomes</p>
<p>Learning Outcomes</p> <p>Upon successful completion of the module, students are expected to:</p> <ul style="list-style-type: none"> - Recognize the usefulness of biomarkers serving the concept of Precision Medicine - Describe specific types of biomarkers and their usefulness in clinical diagnosis and treatment monitoring - They report specific examples of biomarkers utilization in clinical practice

- Describe the research process for the discovery and integration of new biomarkers in clinical practice

General Competences

Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?

<i>Search for, analysis and synthesis of data and information by the use of appropriate technologies,</i>	<i>Project planning and management</i>
<i>Adapting to new situations</i>	<i>Respect for diversity and multiculturalism</i>
<i>Decision-making</i>	<i>Environmental awareness</i>
<i>Individual/Independent work</i>	<i>Social, professional and ethical responsibility and sensitivity to gender issues</i>
<i>Group/Team work</i>	<i>Critical thinking</i>
<i>Working in an international environment</i>	<i>Development of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment (Other.....citizenship, spiritual freedom, social innovative research awareness, altruism etc.)</i>	<i>.....</i>

The general skills that the students will acquire are:

- Work in an international environment
- Work in an interdisciplinary environment
- Production of new research ideas
- Search, analysis and synthesis of data and information, using the necessary technologies
- Promoting free, creative and inductive thinking

(3) MODULE CONTENT

Module

The role of biomarkers in the development of precision medicine provides a strategic opportunity for technological developments to improve human health and reduce health-care cost. Precision medicine as a concept concerns the adjustment of treatments to individual or subgroups of patients based on the use of disease-specific biomarkers. The overall success of this personalized process is to identify actionable molecular targets to pinpoint therapies. Experimental approaches so far have resulted in the development and use of specific biomarkers and therapies to promote precision medicine. In this module the ongoing development and application of biomarkers will be illustrated for both clinical use and treatment monitoring.

Objectives

- Diagnostic biomarkers
- Susceptibility/risk biomarkers
- Monitoring a disease
- Prognostic/predictive biomarkers
- Response and toxicity to a given treatment
- Pharmacodynamic biomarkers
- Surrogate end point biomarkers. The clinical benefit/survival of a disease.
- Biomarker Discovery and Clinical Trial Design

(4) TEACHING METHODS - ASSESSMENT

MODES OF DELIVERY	Distance teaching and distance learning with three Group Counseling Meetings (GCMs) of 4 hours duration during the academic semester on weekends. Also, 1-2 shorter tutoring sessions.
<i>Face-to-face, in-class lecturing, distance teaching and distance learning etc.</i>	

<p>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY</p> <p><i>Use of ICT in teaching, Laboratory Education, Communication with students</i></p>	<p>In GCMs and teaching we use:</p> <ul style="list-style-type: none"> - Remote meetings tools (Webex, Cisco etc.) - Presentation software (e.g. power point, animations etc.) - Specialized software in the subjects under study (NCBI PubMed, NCBI Blast, EndNote, etc.) <p>In addition, students use office automation tools, web browsers and e-readers for digital books.</p> <p>Distance learning and communication with the students is supported by:</p> <ul style="list-style-type: none"> - the (Hellenic Open University (HOU) digital platform http://courses.eap.gr (course information, educational material postings, announcements, messages, exam results, user groups, discussion forums, etc.). - Electronic mail (e-mail) 																	
<p>MODULE DESIGN</p> <p><i>Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc.</i></p> <p><i>The study hours for each learning activity as well as the hours of selfdirected study are given following the principles of the ECTS.</i></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><i>Activity/Method</i></th> <th style="text-align: center;"><i>Semester workload</i></th> </tr> </thead> <tbody> <tr> <td>3 GCMs x 4 hours</td> <td style="text-align: center;">12</td> </tr> <tr> <td>2 educational activities (x 10 hours)</td> <td style="text-align: center;">20</td> </tr> <tr> <td>2 Semester Assignments (x 30 hours)</td> <td style="text-align: center;">60</td> </tr> <tr> <td>Tutoring sessions</td> <td style="text-align: center;">5</td> </tr> <tr> <td>Final examination</td> <td style="text-align: center;">4</td> </tr> <tr> <td>Individual study</td> <td style="text-align: center;">274</td> </tr> <tr> <td>Total module workload (hours)</td> <td style="text-align: center;">375</td> </tr> </tbody> </table>		<i>Activity/Method</i>	<i>Semester workload</i>	3 GCMs x 4 hours	12	2 educational activities (x 10 hours)	20	2 Semester Assignments (x 30 hours)	60	Tutoring sessions	5	Final examination	4	Individual study	274	Total module workload (hours)	375
<i>Activity/Method</i>	<i>Semester workload</i>																	
3 GCMs x 4 hours	12																	
2 educational activities (x 10 hours)	20																	
2 Semester Assignments (x 30 hours)	60																	
Tutoring sessions	5																	
Final examination	4																	
Individual study	274																	
Total module workload (hours)	375																	
<p>STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS</p> <p><i>Detailed description of the evaluation procedures:</i></p> <p><i>Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work, other.....etc.</i></p> <p><i>Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.</i></p>	<p>Student Evaluation – Module Grade</p> <p>a. Two (2) multiple-choice (quiz) educational activities (Q), which contribute equally to the final grade with a value of 5% each.</p> <p>b. Two (2) Semester Assignments (A) which contribute equally to the final grade with a value of 15% each.</p> <p>The scoring of educational activities and assignments is activated only if the student succeeds an overall score equal to or above the base (≥ 5) in the final or repeat exams.</p> <p>c. Final or repeat exams (E) contributing to the final grade of the module by 60%.</p> <p>The Final Grade of the module, within scale 1-10 (10 is the excellent), is calculated as follows: Final Grade=(Q1x0.05) + (Q2x0.05) + (A1x0.15) + (A2x0.05) + (Ex0.6)</p> <p>Language of evaluation: English</p>																	

	The evaluation criteria are explicitly mentioned in the web published study guide (https://www.eap.gr/education/odigos-spoudwn-eap/), as well as in the educational platform (http://courses.eap.gr), with controlled access (use of code) for students.
--	---

(5) SUGGESTED BIBLIOGRAPHY

Books

1. "Handbook of Biomarkers and Precision Medicine", Claudio Carini, Mark Fidock, Alain van Gool, © 2019 by Taylor & Francis Group, LLC
2. Adaptive designs in clinical trials: why use them, and how to run and report them BMC Medicine volume 16, Article number: 29 (2018)

Related Scientific Journals

- Clinical Chemistry
- Clinical Chemistry and Laboratory Medicine
- Clinical Biochemistry
- Biotechnology and Applied Biochemistry
- Clinical Chimica Acta
- Molecular Diagnostics
- Applied Biochemistry and Biotechnology
- Advances in Clinical Chemistry
- Clinical Science
- Annals of Clinical Biochemistry
- Critical Reviews in Clinical Laboratory Sciences
- Journal of Clinical Oncology