

2^o SEMESTER:

COURSE OUTLINE «Medical Informatics»

1. GENERAL

SCHOOL	Informatics and Telecommunications	
ACADEMIC UNIT	Informatics and Telecommunications	
LEVEL OF STUDIES	Post graduate	
COURSE CODE	210	SEMESTER 2
COURSE TITLE	Medical Informatics	
INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS	CREDITS
Lectures	2	6
Laboratory exercises	1	
COURSE TYPE	Special background, Specialized general knowledge, Skills development	
PREREQUISITE COURSES:	Advanced Techniques for Signal Processing	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek	
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)	
COURSE WEBSITE (URL)	https://www.dit.uoi.gr/e-class/courses/257/	

2. LEARNING OUTCOMES

Learning outcomes

Upon successful completion of the course, students will be able to:

- To understand new applications of information technology and telecommunications in health.
- Understand, compare, and document the relative advantages and disadvantages of alternative technological approaches and solutions in Medical Informatics.
- Acquisition of basic knowledge and background concepts for the applications of the positive sciences in medicine.
- Acquiring the ability to develop simple source code in a Matlab environment for biological signal processing and analysis applications.
- Collaboration in a team for the comprehensive treatment (analysis - synthesis) of complex Medical Informatics problems, the critical evaluation of alternative solutions and the decision-making for implementation.

General Competences

The general competences that are acquired upon completion of the course are:

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Production of free, creative, and inductive thinking
- Team work

3. SYLLABUS

The concept of Medical Informatics is now particularly widespread. At the same time, new

applications of IT and telecommunications in health, such as Mobile Health (mHealth), Human Brain-Computer Interfaces and Virtual Reality, have made a dynamic appearance in modern reality. This course aims to introduce the subjects of Medical Informatics by presenting its basic topics, such as Medical Data and Standards, Information Systems in Medicine and Decision Support Systems in Medicine, and Telemedicine and Mobile Health. In addition, the subject of Digital Biosignal Processing is covered in detail by presenting the most important Biomedical Signals and their basic analysis techniques. Finally, modern topics of Medical Informatics such as Medical Imaging, Microscopy Image Analysis, Meta-analysis, Big Medical Data Sources, and the future of Intelligent Assistive Robots are covered in detail through lectures by invited researchers of international impact in the specific field.

Week	Subject title	Bibliography	e-class
1	Introduction and organizational chart	[1]	https://ecourse.uoi.gr/course/view.php?id=3247
2	Introduction to Medical Informatics - Medical Data & Standards	[1]	https://ecourse.uoi.gr/course/view.php?id=3247
3	Information Systems in Medicine	[1]	https://ecourse.uoi.gr/course/view.php?id=3247
4	Telemedicine & Mobile Health	[1]	https://ecourse.uoi.gr/course/view.php?id=3247
5	Decision Support Systems in Medicine	[1]	https://ecourse.uoi.gr/course/view.php?id=3247
6	Biomedical Signals	[1]	https://ecourse.uoi.gr/course/view.php?id=3247
7	Human Brain-Computer Interface	[1]	https://ecourse.uoi.gr/course/view.php?id=3247
8	Microscopy Image Analysis	[1]	https://ecourse.uoi.gr/course/view.php?id=3247
9	Medical Imaging	[1]	https://ecourse.uoi.gr/course/view.php?id=3247
10	Meta-Analysis & Data Sources	[1]	https://ecourse.uoi.gr/course/view.php?id=3247
11	The Future of Intelligent Assistive Robots	[1]	https://ecourse.uoi.gr/course/view.php?id=3247
12	Virtual Reality in Health	[1]	https://ecourse.uoi.gr/course/view.php?id=3247
13	Project Presentation: Presentation of students' theoretical and programming work and recap.	[1]	https://ecourse.uoi.gr/course/view.php?id=3247

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face to face.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	<input checked="" type="checkbox"/> Use of electronic presentations, posted in the e-class <input checked="" type="checkbox"/> Using Software on the Computer during the lecture. <input checked="" type="checkbox"/> Use of specialized software

	<input checked="" type="checkbox"/> Availability of educational material through e-class. <input checked="" type="checkbox"/> Management of tasks/exercises through a website. <input checked="" type="checkbox"/> Communication with students via e-mail. <input checked="" type="checkbox"/> Online chat room for teachers and students.														
TEACHING METHODS	<table border="1"> <thead> <tr> <th>Activity</th> <th>Semester workload</th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td>26 h</td> </tr> <tr> <td>Laboratory practice</td> <td>13 h</td> </tr> <tr> <td>Homeworks</td> <td>31 h</td> </tr> <tr> <td>Project implementation</td> <td>40 h</td> </tr> <tr> <td>Non – directed study</td> <td>70 h</td> </tr> <tr> <td>Course total</td> <td>180 h</td> </tr> </tbody> </table>	Activity	Semester workload	Lectures	26 h	Laboratory practice	13 h	Homeworks	31 h	Project implementation	40 h	Non – directed study	70 h	Course total	180 h
Activity	Semester workload														
Lectures	26 h														
Laboratory practice	13 h														
Homeworks	31 h														
Project implementation	40 h														
Non – directed study	70 h														
Course total	180 h														
ΑΞΙΟΛΟΓΗΣΗ ΦΟΙΤΗΤΩΝ	<p>The evaluation of the course will result from the combination of individual performance for:</p> <ul style="list-style-type: none"> • Homeworks which will contain exercises and programming tasks (40/100). • Project which students will implemented in groups of two people (60/100). <p>The proper Solution methodology (50/100), the understanding of functions (30/100), the correct numerical solution and extraction of results (20/100) will be evaluated.</p> <p>For all of the above, there will be corresponding material posted on the course website, many similar examples of equal difficulty, also indicative examples of written assignments and laboratory exercises.</p>														

5. ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

1. Τσιπούρας, Μ., Γιαννακέας, Ν., Καρβούνης, Ε., Τζάλλας, Α., 2015. Ιατρική πληροφορική. [ηλεκτρ. βιβλ.] Αθήνα:Σύνδεσμος Ελληνικών Ακαδημαϊκών Βιβλιοθηκών. Διαθέσιμο στο: <http://hdl.handle.net/11419/2975>
2. Αγγελίδης, Π., 2015. Ηλεκτρονική Υγεία. [ηλεκτρ. βιβλ.] Αθήνα:Σύνδεσμος Ελληνικών Ακαδημαϊκών Βιβλιοθηκών. Διαθέσιμο στο: <http://hdl.handle.net/11419/5994>
3. Βεντούρας, Ε., 2015. Τεχνολογία της in-vivo διαγνωστικής - Διατάξεις απαγωγής βιοηλεκτρικών σημάτων. [ηλεκτρ. βιβλ.] Αθήνα:Σύνδεσμος Ελληνικών Ακαδημαϊκών Βιβλιοθηκών. Διαθέσιμο στο: <http://hdl.handle.net/11419/1832>
4. Τσαντής, Σ., 2015. Αρχές φυσικής και τεχνολογίας της διαγνωστικής υπερηχογραφίας. [ηλεκτρ. βιβλ.] Αθήνα:Σύνδεσμος Ελληνικών Ακαδημαϊκών Βιβλιοθηκών. Διαθέσιμο στο: <http://hdl.handle.net/11419/5978>