COURSE OUTLINE

(1) GENERAL

SCHOOL	Social Sciences
ACADEMIC UNIT	Cultural Technology and Communication
LEVEL OF STUDIES	Undergraduate
COURSE CODE	ΠΛΡ145

COURSE CODE	ΠΛΡ145	**SEMESTER**	7th
COURSE TITLE	Internet of Things (IoT)		

INDEPENDENT TEACHING ACTIVITIES *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*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	2	5
Laboratories	1	
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).	3	5

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Optional/Special Background
PREREQUISITE COURSES:	No
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek/English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	yes
COURSE WEBSITE (URL)	https://eclass.aegean.gr/courses/131418/

(2) LEARNING OUTCOMES

Learning outcomes

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.

Consult Appendix A
- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

At the end of this course, the students should be able to:
- Be familiar with the specific features and architectures of Internet of Things (IoT)
- Understand basic features/functionalities of devices and communication protocols of IoT
- Understand features of services and applications of IoT
- Design and develop applications for IoT
- Perceive future developments in all aspects of IoT.

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	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*

Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment	*......*
Production of new research ideas	*Others...*
	....

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Production of free, creative and inductive thinking
- Transfer of know-how in other environments
- Working in an interdisciplinary environment
- Practice Critical Thinking

(3) SYLLABUS

The course focuses on the Internet of Things (IoT). Specifically, the syllabus of the course concerns the following topics and correspondent lectures:

1. Introduction in cyber-physical systems and IoT: Definitions, basic features, architectures in IoT
2. IoT and AI, the future of IoT, 4th Industrial Revolution (Industry 4.0)
3. The Semantic Web of Things
4. IoT and communication: Protocols and architectures of wireless and mobile communications, wireless sensor networks, protocols IEEE 802.15.4 and ZigBee, Radio Frequency Identification (RFID), Machine-to-Machine communication, 6LoWPAN and RPL protocols
5. IoT and software: OS for resources-constrained devices (TinyOS), application-level protocols for IoT (CoAP), Message Queue Telemetry Transport (MQTT), Extensible Messaging and Presence Protocol (XMPP), Representational State Transfer (RESTFUL Services), Advanced Message Queuing Protocol (AMQP), Websockets
6. IoT and hardware: Smart devices, sensors, actuators, Arduino and RaspberryPi platforms
7. Smart devices development and programming – I
8. Smart devices development and programming – II
9. IoT and Big Data, cloud computing and data centers: Crowdsourcing, interoperability, collection and smart storage/processing/analysis of data (data analytics)
10. IoT and Mobile and Pervasive Computing Systems: Architectures and design issues, applications, localization
11. IoT and Use Cases/Applications: Smart Cultural Spaces, Smart Buildings, Smart Museums, Smart Cities, Smart Grids, Smart Transportation, etc.
12. Interoperability in IoT
13. Privacy and security in IoT

Additional/advanced topics: Social internet of things, Internet of Everything

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of open source software for the programming of devices (Arduino/Raspberry Pi, ThingSpeak cloud platform). Use of ICT in teaching and communication with students.
TEACHING METHODS *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*	*(see table below)*

Activity	Semester workload
Lectures	13 *3 hours =39 hours
Lectures' study	13*2 hours = 26 hours
Laboratory Practice	13*3 = 39 hours
Laboratory Preparation and semester assignment	13*2=26 hours
Course total	**130 hours**

STUDENT PERFORMANCE EVALUATION *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.*	Students are familiar with the evaluation criteria from the first course lecture. All notes are stored in the course's area in University e-class platform (eclass.aegean.gr). The evaluation of students' performance is conducted at the end of the semester with a final assignment for the course, with a weighted percentage of 100%.

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Hassan, Internet of Things A to Z [electronic resource], ISBN: 9781119456735

-Suggested Web resources:
- IEEE Internet of Things (IoT) Initiative http://iot.ieee.org
- Internet of Things Europe http://www.internet-of-things.eu/resources/footerresources/eu-initiatives
- ITU-T Internet of Things Global Standards Initiative http://www.itu.int/en/ITU-T/gsi/iot/Pages/default.aspx
- IEEE IoT Standards http://standards.ieee.org/innovate/iot

- Related academic journals:
- IEEE Internet of Things Journal
- IEEE IoT Newsletter
- ACM IoT journal