



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
Α.ΔΙ.Π.
ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ & ΠΙΣΤΟΠΟΙΗΣΗΣ
ΤΗΣ ΠΟΙΟΤΗΤΑΣ ΣΤΗΝ ΑΝΩΤΑΤΗ
ΕΚΠΑΙΔΕΥΣΗ

HELLENIC REPUBLIC
H.Q.A.A.
HELLENIC QUALITY ASSURANCE
AND ACCREDITATION AGENCY

ΤΕΧΝΟΛΟΓΙΚΟ ΕΚΠΑΙΔΕΥΤΙΚΟ ΙΔΡΥΜΑ ΑΝΑΤΟΛΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ ΚΑΙ ΘΡΑΚΗΣ
ΜΟΝΑΔΑ ΔΙΑΣΦΑΛΙΣΗΣ ΤΗΣ ΠΟΙΟΤΗΤΑΣ ΤΕΙ ΑΜΘ

Quality Assurance in Higher Education Course Data Collection Form

ΤΕΧΝΟΛΟΓΙΚΟ ΕΚΠΑΙΔΕΥΤΙΚΟ ΙΔΡΥΜΑ
ΑΝΑΤΟΛΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ & ΘΡΑΚΗΣ
ΑΓΙΟΣ ΛΟΥΚΑΣ,
65404 ΚΑΒΑΛΑ

EASTERN MACEDONIA AND THRACE
INSTITUTE OF TECHNOLOGY
AGIOS LOUKAS
65404 KAVALA

COURSE OUTLINE

1. GENERAL

SCHOOL	School of Technological Applications		
ACADEMIC UNIT	Department of Electrical Engineering		
DEGREE LEVEL	Undergraduate		
COURSE CODE	ΣΤΝ11	SEMESTER	6 st
COURSE TITLE	Non Linear circuits and Cryptography		
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	
Lectures	2	3	
<i>Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	<i>specialised general knowledge,</i>		
Required passed courses:	-		
TEACHING AND EXAMS LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	No		
COURSE WEBPAGE (URL)	http://eclass.teikav.edu.gr/ED188/		

2. LEARNING OUTCOMES

<p>Learning outcomes <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> <i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i> 																			
<p>The objectives of this course are to bring students into contact with the basic notions of non-linear dynamics, chaos theory, chaotic circuits and their applications in unconventional cryptography. At the same time, it will acquire basic knowledge of conventional cryptography. Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> • Study chaotic systems. • Design chaotic circuits. • Study the characteristics of non-linear circuits. • Study the chaotic synchronization between circuits. • Evaluate non-conventional - chaotic encrypted communication systems. 																			
<p>General Competences <i>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?</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></td> <td style="width: 50%; border: none;"><i>Project planning and management</i></td> </tr> <tr> <td style="border: none;"><i>Adapting to new situations</i></td> <td style="border: none;"><i>Respect for difference and multiculturalism</i></td> </tr> <tr> <td style="border: none;"><i>Decision-making</i></td> <td style="border: none;"><i>Respect for the natural environment</i></td> </tr> <tr> <td style="border: none;"><i>Working independently</i></td> <td style="border: none;"><i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i></td> </tr> <tr> <td style="border: none;"><i>Team work</i></td> <td style="border: none;"><i>Criticism and self-criticism</i></td> </tr> <tr> <td style="border: none;"><i>Working in an international environment</i></td> <td style="border: none;"><i>Production of free, creative and inductive thinking</i></td> </tr> <tr> <td style="border: none;"><i>Working in an interdisciplinary environment</i></td> <td style="border: none;"><i>.....</i></td> </tr> <tr> <td style="border: none;"><i>Production of new research ideas</i></td> <td style="border: none;"><i>Others...</i></td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;"><i>.....</i></td> </tr> </table>		<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>	<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>	<i>Decision-making</i>	<i>Respect for the natural environment</i>	<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>	<i>Team work</i>	<i>Criticism and self-criticism</i>	<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>	<i>Working in an interdisciplinary environment</i>	<i>.....</i>	<i>Production of new research ideas</i>	<i>Others...</i>		<i>.....</i>
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<ul style="list-style-type: none"> • Research, analysis and synthesis of data and information with the usage of the necessary technology. • Autonomous work. 																			

- Teamwork.
- Work in a scientific environment.
- Apply criticism and self-criticism.
- Promote of free, creative and inductive thinking.

3. COURSE CONTENT

- 1 Introduction to non-linear dynamics
- 2. Theory of Chaos.
- 3. Nonlinear systems and evaluation of their characteristics.
- 4. Non-linear circuits.
- 5. Chaotic synchronization.
- 6. Encrypted information transmission systems.
- 7. Non-conventional encrypted information transmission systems.
- 8. Evaluation of cryptographic features

4. TEACHING AND LEARNING METHODS - ASSESSMENT

<p>TEACHING METHOD <i>Face-to-face, Distance learning, etc.</i></p>	Room Lecture											
<p>UTILISATIONS OF INFORMATION AND COMMUNICATION TECHNOLOGIES <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	Syllabus organization in PPT slides. Learning process support through e-class electronic Contact via email.											
<p><i>The manner and methods of teaching are described in detail.</i> <i>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.</i></p> <p><i>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></p>	<table border="1"> <thead> <tr> <th><i>Activity</i></th> <th><i>Semester workload</i></th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td>60</td> </tr> <tr> <td>Writing of small courseworks</td> <td>15</td> </tr> <tr> <td>Self-contained coursework</td> <td>15</td> </tr> <tr> <td>Course Summary (30 workload per credit)</td> <td>90</td> </tr> </tbody> </table>	<i>Activity</i>	<i>Semester workload</i>	Lectures	60	Writing of small courseworks	15	Self-contained coursework	15	Course Summary (30 workload per credit)	90	
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Course Summary (30 workload per credit)	90											
<p>STUDENT ASSESSMENT <i>Description of the evaluation procedure</i></p> <p><i>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</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>Writing of small courseworks (10%). Exams (90%) consisting of mathematic problems from various units of the course (Note usage is not allowed).</p>											

5. RECCOMENDED READING

- *Suggested bibliography:*
- *Related academic journals:*
- C. Paar, J. Pelzl, “Understanding Cryptography”, Springer, 2009.
- W.M. Tam, F. C.M. Lau, C.K. Tse, “Digital Communications with Chaos”, Elsevier, 2004.
- M.P. Kennedy, R. Rovatti, G. Setti, “Chaotic Electronics in Telecommunications”, CRC Press, 2000.