DIGITAL DESIGN

1. GENERAL

SCHOOL OF	ENGINEERING		
DEPARTMENT OF	INFORMATICS AND COMPUTER ENGINEERING		
LEVEL OF EDUCATION	UNDERGRADUATE		
COURSE CODE	ICE-2005	**SEMESTER OF STUDIES**	2ο
COURSE TITLE	DIGITAL DESIGN		

INDEPENDENT TEACHING ACTIVITIES *in case the credits are awarded in separate parts of the course e.g. Lectures, Laboratory Exercises, etc. If the credits are awarded uniformly for the whole course, indicate the weekly teaching hours and the total number of credits.*	**WEEKLY HOURS OF TEACHING**	**ECTS CREDITS**
Lectures	2	
Practice -Exercises	1	
Lab	1	
Add rows if needed. The teaching organization and teaching - methods used are described in detail in 4.	**4**	**5**

COURSE TYPE *Background, General Knowledge, Scientific Area, Skills Development*	Background (General Background)
PREREQUISITE COURSES:	None
LANGUAGE OF TEACHING AND EXAMS :	Greek and English
ERASMUS STUDENTS	Yes (English)
ONLINE COURSE (URL) (if available)	http://www.uniwa.gr/ice/didi.html

2. LEARNING OUTCOMES

Learning outcomes

The learning outcomes of the course are described, the specific knowledge, skills and abilities of an appropriate level that students will acquire after the successful completion of the course.

Refer to Appendix A.

- *Description of the Level of Learning Outcomes for each course according to the Qualifications Framework of the European Higher Education Area*
- *Descriptive Indicators Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Annex B*
- *Summary Guide for writing Learning Outcomes*

The course is a basic introductory course in the design of digital systems and the organization and operation of computer systems. The course material aims to introduce students to the basic concepts of numerical systems of codes used in electronic computers, the analysis and design of combinational circuits, the analysis and design of modern sequential circuits. It also introduces students to the modern implementation technologies of digital systems (integrated and printed circuits).

Upon successful completion of the course the student will be able to:

- To understand the numerical systems used in computers
- To analyze and design combinational digital circuits.
- To analyze and design sequential digital circuits
- To use basic instruments such as multimeters, oscilloscopes, function generators.
- Simulate digital circuits and verify their operation.

General Abilities

Taking into account the general skills that the graduate must have acquired (as they are listed in the Diploma Supplement and are listed below), which of them is intended for the course ?.

Search, analysis and synthesis of data and information, using the necessary technologies	*Project design and management*
Adaptation to new situations	*Respect for diversity and multiculturalism*
Decision making	*Respect for the natural environment*
Autonomous work	*Demonstration of social, professional and moral responsibility and sensitivity in gender issues*
Teamwork	*Exercise criticism and self-criticism*

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

- Search, analysis and synthesis of data and information, using the necessary technologies
- Autonomous Work
- Teamwork
- Design and implementation of digital circuit

3. COURSE CONTENT

Course Outline

Numerical Systems-Codes. Boole Algebra. Algebra of Switches. Error detection and correction codes and circuits. Logical functions. Logic gates. Simplification and implementation of logical functions. Analysis and Design of Combinational Circuits. Multiplexers. Encoders. Decoders. Numerical circuits. Flip flops. Registrers. Asynchronous, Synchronous Enumerators.

4. TEACHING AND LEARNING METHODS - EVALUATION

METHOD OF DELIVERY *Face to face, Distance education etc.*	In class face to face and in the laboratory
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES *Use of ICT in Teaching, in Laboratory Education, in Communication with students*	Specialized Simulation Software Learning process support through the University's e-learning platform
TEACHING ORGANIZATION *The way and methods of teaching are described in detail.* *Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliography study & analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive teaching , Study visits, Study work, artwork, creation. λπ.* *The student study hours for each learning activity are indicated as well as the non-guided study hours so that the total workload at the semester level corresponds to the ECTS standards .*	

Activity	***Semester Workload***
Lectures	26
Practice Exercises that focus on the application of methodologies and analysis of studies	13
Laboratory Excersises	13
Tasks	25
Independent Study	48
Total Course Load (25 hours per credit)	**125**

STUDENT EVALUATION *Description of the evaluation process* *Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Report / Report, Oral Examination, Public Presentation, Public Presentation, Others* *Explicitly defined assessment criteria are stated and if and where they are accessible to students.*	1. Final written exam on the theoretical part that includes questions on the teaching material-Problem solving (60%) 2. Oral and written examination on laboratory exercises and work (40%)

5. RECOMMENDED-BIBLIOGRAPHY

- Suggested Bibliography:

1. Κωνσταντίνος Ευσταθίου, Ψηφιακή Σχεδίαση, Εκδόσεις Νέων Τεχνολογιών, 2012

2. «Σχεδίαση και Υλοποίηση λογικών Κυκλωμάτων», Π. Γιαννακόπουλος, Λ, Ασλάνογλου, Λύχνος, 2014
3. «Ψηφιακά Κυκλώματα», Παν. Ηρ. Γιαννακόπουλος, Λύχνος, 2012
4. Stephen Brown, Zvonco Vranesic, Σχεδιασμός Ψηφιακών Συστημάτων με την Γλώσσα VHDL