

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	DEPARTMENT OF ELECTRONICS ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	2603005	SEMESTER	3
COURSE TITLE	Architecture and Organization of Microcomputers I		
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 (ECTS)	
Lectures	2	4	
Laboratory	2		
<i>Add rows if necessary. The organisation 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>	Special Background Course		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	http://electronics.teipir.gr/personalpages/vasiliadis/MIKROYPOLOGISTES_I/A_O_MIKROYPOLOGISTWN_I.html http://electronics.teipir.gr/personalpages/vasiliadis/ERG_MIKROYPOLOGISTWN_I/MIKROYPOLOGISTES_I.html		

(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*

Upon successful completion of this course module students possess advanced knowledge, skills and competences in the subject of Architecture and Organization of Microcomputers that enable them to:

- Describe by block diagrams the inner architecture and organization of 8-bit microprocessors,
- Select the appropriate implementation of a microcomputer system for the needs of the specific application addressed,
- Use appropriate tools to program a microprocessor in machine language or in

symbolic language,

- Interpret and check the validity of the results of the programs developed, both at the system and at the user level,
- Analyse microcomputer system applications problems and construct solutions (design microcomputer systems) under technical and budget constraints,
- Collaborate in a team for the integral addressing (analysis – synthesis) of complex microcomputer systems design and development methods at the hardware and at the software level, for the assessment of alternative solutions and for decision making towards implementation.

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

Adapting to new situations

Decision-making

Working independently

Team work

Working in an international environment

Working in an interdisciplinary environment

Production of new research ideas

Project planning and management

Respect for difference and multiculturalism

Respect for the natural environment

Showing social, professional and ethical responsibility and sensitivity to gender issues

Criticism and self-criticism

Production of free, creative and inductive thinking

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Others...

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- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Team work
- Project planning and management

(3) COURSE CONTENT

Lectures

1. Introduction
2. Internal organization and units of a simple microprocessor system
3. Central Processing Unit
4. Memory interfacing
5. Programming, Operating Systems
6. Programming, Hex code, Assembly language
7. Instruction set I
8. Instruction set II
9. Interrupts
10. I/O modules
11. Parallel port
12. Design of a simple microprocessor system I
13. Design of a simple microprocessor system II

Laboratory Experiments:

1. Introduction, safety regulations
2. Loading and execution of a program using an emulator
3. 8 and 16 bits loading instructions

4. Exchange and transfer instructions
5. Jump instructions, delay routines
6. Call and return instructions
7. Arithmetic and Logic instructions
8. ASCII data manipulation
9. Arithmetic operations of binary and hex numbers
10. Operations of multiple bytes numbers
11. BCD arithmetic
12. Interrupt mechanisms
13. Final overview

(4) TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;">DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	Face to face lectures														
<p style="text-align: center;">USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<ul style="list-style-type: none"> • Use of electronic presentation with multimedia content in class, • Student support through the course webpage and the departmental e-learning platform, • Electronic communication of instructors and students, through the course webpage and by e-mail. • Use of special software for programming in the lab. 														
<p style="text-align: center;">TEACHING METHODS <i>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</i></p>	<p>Lectures, Laboratory experiments, study.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="background-color: #e0e0e0;">Activity</th> <th style="background-color: #e0e0e0;">Semester workload (hours)</th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td style="text-align: center;">26</td> </tr> <tr> <td>Study for lectures</td> <td style="text-align: center;">26</td> </tr> <tr> <td>Laboratory experiments</td> <td style="text-align: center;">26</td> </tr> <tr> <td>Report on lab experiments</td> <td style="text-align: center;">26</td> </tr> <tr> <td>Study and preparation for exams</td> <td style="text-align: center;">16</td> </tr> <tr> <td>Course Total</td> <td style="text-align: center;">120</td> </tr> </tbody> </table>	Activity	Semester workload (hours)	Lectures	26	Study for lectures	26	Laboratory experiments	26	Report on lab experiments	26	Study and preparation for exams	16	Course Total	120
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<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION <i>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.</i></p>	<p>Final grade = Theory part grade x 60% + Lab part grade x 40%</p> <p>Theory Part grade: Final exam (60%) Midterm exam (30%) Participation (10%)</p> <p>Lab part grade: Average of all grades received at each weekly Lab Experiment</p>														

(5) ATTACHED BIBLIOGRAPHY

Essential reading

1. Z-80 Microprocessor: Architecture, Interfacing, Programming, and Design, Gaonkar, Prentice Hall.
2. The 8051 Microcontroller: A Systems Approach, Mazidi, McKinlay and Mazidi, Prentice Hall.
3. Microcomputers and Microprocessors: The 8080, 8085, and Z-80 Programming, Interfacing, and Troubleshooting, Uffenbeck, Prentice Hall.

Recommended Books

1. Digital and Microprocessor Fundamentals: Theory and Application, Kleitz, Prentice Hall.
2. UFFENBECK, J., Microcomputer and Microprocessors, Prentice Hall (Pearson Education).
3. HALL, D., Microprocessors and Digital Systems, McGraw-Hill.
4. PASAHOW, E., Microprocessor Technology and Microcomputers, Mc Graw-Hill