COURSE OUTLINE

(1) GENERAL

<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACADEMIC UNIT</td>
<td>Department of Computer Engineering &amp; Informatics</td>
</tr>
<tr>
<td>LEVEL OF STUDIES</td>
<td>Undergraduate</td>
</tr>
<tr>
<td>COURSE CODE</td>
<td>CEID_NY463</td>
</tr>
<tr>
<td>SEMESTER</td>
<td>8th</td>
</tr>
<tr>
<td>COURSE TITLE</td>
<td>ADVANCED MICROPROCESSORS</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>WEEKLY TEACHING HOURS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>4</td>
</tr>
</tbody>
</table>

Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).

<table>
<thead>
<tr>
<th>COURSE TYPE</th>
<th>Special background, special background, specialised general knowledge, skills development</th>
</tr>
</thead>
<tbody>
<tr>
<td>LANGUAGE OF INSTRUCTION and EXAMINATIONS</td>
<td>Greek</td>
</tr>
<tr>
<td>IS THE COURSE OFFERED TO ERASMUS STUDENTS</td>
<td>No</td>
</tr>
<tr>
<td>COURSE WEBSITE (URL)</td>
<td><a href="https://eclass.upatras.gr/courses/CEID1157/">https://eclass.upatras.gr/courses/CEID1157/</a></td>
</tr>
</tbody>
</table>

(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

A. Lectures and Tutorials
Upon successful completion of the course, a student will be able to:

(1) analyse the general model of an advanced microprocessor and their peripherals,
(2) obtain the knowledge and be able to program advanced microprocessors, of current and future technologies,
(3) have the appropriate knowledge and background to design and implement an advanced microprocessor,
(4) design and program microprocessors of alternative design families and technologies,
(5) integrate interconnections of peripherals units,
(6) evaluate the functionality and the performance, of advanced microprocessors, via simulation tools.

B. Laboratory Exercises
Upon successful completion of the course, a student will be able to:

(1) to program an advanced microprocessor platform,
(2) to implement functions and services,
(3) evaluate the right operation and performance,
(4) to take measurements, via real time scenarios of operation.

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 | Others... |

Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Production of free, creative and inductive thinking

(3) SYLLABUS

- Basic concepts, fundamental definitions,
- Hardware and Software Design,
  - Co-design factors,
  - Modeling,
- Data flow,
  - Implementation in hardware,
  - Implementation in software,
- Control flow: design & implementation,
- Finite-state machines,
- Microprogramming,
  - Code-compilation quality,
  - Code structure,
- Embedded kernels of general purpose,
- Categories of microprocessors,
- Systems in hardware,
  - Design principles,
  - Design architectures,
- Channels in hardware,
- Networks on Chip,
- Hardware and software, interface environments,
- Microprocessors design,
- Design of co-processors,
- Current and future microprocessors/co-processors,
- Advanced topics and applications.

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<thead>
<tr>
<th>DELIVERY</th>
<th>Face-to-face, Distance learning, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</td>
<td>Wide use of ICT and more specifically:</td>
</tr>
<tr>
<td>Use of ICT in teaching, laboratory education, communication with students</td>
<td>The course is backed up by a homepage, providing all course materials. This web page is duly updated.</td>
</tr>
<tr>
<td></td>
<td>Course announcements are provided electronically and are available via: online news platform, and e-mail.</td>
</tr>
<tr>
<td></td>
<td>The communication with the students is performed electronically: via e-mail. An online course forum, is also supported, for questions/answers, comments etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>Activity</th>
<th>Semester workload</th>
</tr>
</thead>
<tbody>
<tr>
<td>The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of</td>
<td>Lectures</td>
<td>26 hours</td>
</tr>
<tr>
<td></td>
<td>Laboratory exercises</td>
<td>26 hours</td>
</tr>
<tr>
<td></td>
<td>Homework of laboratory exercises</td>
<td>26 hours</td>
</tr>
</tbody>
</table>
# 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.

The students’ assessment is supported in Greek, through a final written examination, twice in each academic year. The examination is based in two independent modules: theory and laboratory exercises.

The examination of the theory is organized by development questions, short answer questions, exercises and problems solving. Within ten days of the examination, scores and indicative answers to the exam questions are announced, and posted electronically. It is defined a day and an hour at which students can see their exams’ papers about any questions and doubts they may have, as well as to express their disagreement in rating, if they so wish. Then the rating is validated and finalized.

The evaluation of the laboratory exercises is done during students’ practice, in the laboratory room, but also in the laboratory reports they deliver after their completion.

# ATTACHED BIBLIOGRAPHY

- **Suggested bibliography:**

- **Related academic journals:**
  - IEEE Micro,
  - IEEE Transactions on Computers,
  - IEEE Transactions on Circuits and Systems,
  - IEEE Transactions on VLSI Systems