(1) GENERAL

<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>SCHOOL OF ENGINEERING</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACADEMIC UNIT</td>
<td>DEPARTMENT OF ELECTRONICS ENGINEERING</td>
</tr>
<tr>
<td>LEVEL OF STUDIES</td>
<td>UNDERGRADUATE</td>
</tr>
<tr>
<td>COURSE CODE</td>
<td>2602005</td>
</tr>
<tr>
<td>SEMESTER</td>
<td>2</td>
</tr>
<tr>
<td>COURSE TITLE</td>
<td>Electronic Component Technology and PCB Design</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 (ECTS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>2</td>
</tr>
<tr>
<td>Laboratory</td>
<td>2</td>
</tr>
</tbody>
</table>

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

COURSE TYPE

Special Background Course

general background, special background, specialised general knowledge, skills development

PREREQUISITE COURSES:

None

LANGUAGE OF INSTRUCTION AND EXAMINATIONS:

Greek

IS THE COURSE OFFERED TO ERASMUS STUDENTS:

NO

COURSE WEBSITE (URL):

http://www.electronics.teipir.gr/personalpages/papageorgas/download/2/

(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 Electronic Components and PCB Design that enable them to:

- Recognize and identify electronic components
- Identify codes of components
- Components function test
- Design using computer software, analog, digital and hybrid circuits
- Design a printed circuit board
- Implement a printed circuit board
**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
- Working independently
- Team work
- Production of free, creative and inductive thinking

### (3) COURSE CONTENT

**Lectures:**

1. Materials I
   - Solid, liquid, gas
2. Materials II
   - Conductors, insulators, semiconductors and semiconductor characteristics
3. Resistors
   - Characteristics of resistors, resistor codes, resistors categories and variable resistors
4. Dielectrics-Capacitors
   - Polarization types and electrical properties of the dielectric capacitors, categories of capacitors and characteristics
5. Capacitors
   - Dielectric capacitors, electrolytic, IC capacitors, SMD and variable capacitors
6. Coils
   - Losses cored coils, induction factor with inductors, coils with core or gap, coils categories, elements of L.H and H.F, special coils
7. Ferrites
   - Features of ferrites, ferrites categories regulation of inductance cores and codes, calculate inductance with ferrite core
8. Transformers
   - Uses of transformers and transformer operating principles, transformer types and autotransformers
9. Sensors I
   - Categories of sensors, traducers and actuators, sensors usage information, use of mechanical stress and pressure sensors
10. Sensors II
    - Accelerometer, magnetoresistance, categories, items, usage of temperature sensors
11. Integrated Circuits
    - Categories of Integrated Circuits (ICs), SSI, MSI, LSI and VLSI, photolithographic method
12. Printed Circuits Boards (PCB) I
    - Printed circuit boards, single- and double-sided
13. Printed Circuits (PCB) II
Flexible PCB and multilayer PCB

Laboratory:
Design and construction of a PCB during the semester.

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<thead>
<tr>
<th>DELIVERY</th>
<th>Face to face lectures</th>
</tr>
</thead>
<tbody>
<tr>
<td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</td>
<td>Use of ICT in teaching, laboratory education, communication with students</td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Lectures, Laboratory experiments, study.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity</th>
<th>Semester workload (hours)</th>
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<tbody>
<tr>
<td>Lectures</td>
<td>26</td>
</tr>
<tr>
<td>Study for lectures</td>
<td>26</td>
</tr>
<tr>
<td>Laboratory experiments</td>
<td>26</td>
</tr>
<tr>
<td>Report on lab experiments</td>
<td>26</td>
</tr>
<tr>
<td>Study and preparation for exams</td>
<td>16</td>
</tr>
<tr>
<td>Course Total</td>
<td>120</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.

Final grade = Theory part grade x 60% + Lab part grade x 40%

Theory part grade:
Individual Project (30%):
Written examination (70%)
Final written examination that includes:
• Multiple choice questions
• General comprehension questions regarding the electronic components and PCB design

Laboratory part grade:
• Implementation of a project (40%)
• Carry out a series of exercises regarding PCB design (60%)

(5) ATTACHED BIBLIOGRAPHY
**Recommended Books**

3. Data Books (Philips, National, RS Components, Analog Device, Fairchild Semiconductors, Harris, etc.
4. Lecture notes by the instructor
5. Laboratory notes by the instructor