**COURSE OUTLINE**

1. **GENERAL**

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| **SCHOOL** | ENGINEERING | | | | |
| **ACADEMIC UNIT** | Department of Computer Engineering and Informatics | | | | |
| **LEVEL OF STUDIES** | Undergraduate | | | | |
| **COURSE CODE** | **23Υ208** | **SEMESTER** | | **4th** | |
| **COURSE TITLE** | ANALOG AND DIGITAL ELECTRONICS | | | | |
| **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* | | | **WEEKLY TEACHING HOURS** | | **CREDITS** |
| Lectures and Tutorial Exercises | | | 2(L), 2(TE) | | 4 |
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| *Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).* | | |  | | 4 |
| **COURSE TYPE**  *general background,  special background, specialised general knowledge, skills development* | General Background | | | | |
| **PREREQUISITE COURSES:** | Circuit Theory | | | | |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | Greek | | | | |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | No | | | | |
| **COURSE WEBSITE (URL)** |  | | | | |

1. **LEARNING OUTCOMES**

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| **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 conclusion of the course the students ought to be able to:**   * Understand the basic concepts of Semiconductors and Electronics * Developing skills in the design of active analog filters * Solve and design basic circuits of diodes, BJT transistors, FETs. * Analysis and design of Digital circuits   **Upon conclusion of the course the students are expected to have the following skills/competences:**   * Will be familiar with the basic concepts of Electronic components of analog and digital circuits * He will be able to apply the above to solve problems arising from the field of Computer Engineering | |
| **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*  *……*  *Others…*  *…….* |
| * Search, analysis and synthesis of data and information, using the necessary technologies * Adaptation to new situations * Autonomous work * Decision making * Generating new research ideas | |

1. **SYLLABUS**

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| * Semiconductors and Diodes. The pn junction and the diode. Circuit models. Rectifier circuits, Zener and voltage regulators. * Bipolar junction transistor (BJT). Selecting the Operating Point of a BJT. Small-signal model. * Field-effect transistor (FET). Classification of FETs. MOSFET technology. * BJT and FET circuit amplifiers. * Operational amplifiers and active analog filters * Introduction to digital technology. Inverter. Power consumption and digital signal propagation delay. * Basic digital gateways and PUN and PDN implementation. Noise margins. * CMOS technology. Dynamic CMOS. * Storage circuits. |

1. **TEACHING and LEARNING METHODS - EVALUATION**

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| **DELIVERY** *Face-to-face, Distance learning, etc.* | Face-to-face. |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** *Use of ICT in teaching, laboratory education, communication with students* | ICT methods are used in both teaching and communication with the students. Lecture slides and supplementary material are uploaded in the course’s web site. In case of distance lectures, the recording will be provided. |
| **TEACHING METHODS**  *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* | |  |  | | --- | --- | | ***Activity*** | ***Semester workload*** | | Lectures | 4\*13=52 | | Tutorials (exercises) |  | | Self-Study | 48 | |  |  | |  |  | |  |  | |  |  | | Course total (25-30 hours per ECTS unit) | **100** | |
| **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.* | Language of evaluation: Greek  Final Examination (100% of total score) |

1. **ATTACHED BIBLIOGRAPHY**

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| *- Suggested bibliography:*   * Μικροηλεκτρονική, 5η Έκδοση-Βελτιωμένη Jaeger Richard - Blalock Travis Α. ΤΖΙΟΛΑ & ΥΙΟΙ ΑΕ 2017 ΘΕΣ/ΝΙΚΗ 68380792 * ΜΙΚΡΟΗΛΕΚΤΡΟΝΙΚΑ ΚΥΚΛΩΜΑΤΑ ΤΟΜΟΣ Β 7η έκδοση (ISBN 978-960-491-108-0) ADEL. S. SEDRA & KENNETH C. SMITH, Ι. ΠΑΠΑΝΑΝΟΣ Α. ΠΑΠΑΣΩΤΗΡΙΟΥ & ΣΙΑ ΟΕ 2017 ΑΘΗΝΑ 68396070 |