COURSE OUTLINE

(1) GENERAL

SCHOOL	ENGINEERING		
ACADEMIC UNIT	ELECTRICAL AND COMPUTER ENGINEERING DEPT.		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**ECE_K631**	**SEMESTER**	**6**
COURSE TITLE	INTERNAL ELECTRICAL INSTALLATIONS & AYTOMATION		

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	3	
Seminars / Practice exercises	1	
Laboratory	1	
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).	5	5

COURSE TYPE *general background, special background, specialised, general knowledge, skills development*	Special background, Skills Development
PREREQUISITE COURSES:	No. Students are advised to have already attended the courses: Electrical Circuits I&II, Electrical Machines I
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	https://www.ece.uop.gr/

(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*

The main goal of the course is the basic knowledge in the field of the internal electrical installations both at the level of the calculations and at the ability of constructing the main circuits.

Learning Outcomes

After the successful completion of the course, the students will:

At the knowledge level:

1. Understandthemainprinciplesofthe circuits being constructed in an electrical installation in a building.
2. Be fully aware of the materials used in an electrical installation.
3. Be informed of the regulations that rule the electrical installations.
4. Know the materials which are used in industrial automation.
5. Be aware of the layout of an automation drawing.
6. Apply properly the basic knowledge of the electrical machines for their proper supply with electrical power.

At the skill level:

1. Calculate the necessary electrical parameters which are used in the study of an electrical installation such as the cable current .
2. Calculate and define all the necessary materials of an electrical installation such as protection devices, materials used for mechanical protection etc.
3. Work safely with electrical circuits and switchboards
4. Design and utilize automation circuits including electrical motors.

At the level of abilities:

1. Construct real circuits of electrical installations and industry automation.
2. Construct 1ph and 3ph electrical switchboards for domestic and industrial use following the appropriate regulations.
3. Understand and solve complex problems relating with the electrical installations
4. Generalize the obtained knowledge in the field of the electrical 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	*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	*……*
Production of new research ideas	*Others…*
	…….

1. Search for, analysis and synthesis of data and information, with the use of the necessary technology
2. Working independently
3. Team work
4. Decision – making

(3) SYLLABUS

Theory

1. Low voltage networks.
2. Circuits in an electrical installation.
3. Materials andspecifications in internal electrical installations.
4. Low voltage protection devices. Definition of nominal values.
5. Calculation of line current. Definition of a cable size according to regulations.
6. Analysis and design of 1ph and 3ph electrical switchboards.
7. Calculation of all the materials in an industrial switchboard.
8. Industrial automation materials. Presentation and guidelines.
9. Design of industrial automation flowcharts.
10. Starting methods of 3ph motors in industry.
11. The use of the soft-starter for starting a 3ph motor. The design of the relevant automation circuits.
12. Faults in electrical installations.

Laboratory

1. Presentation of materials and the way of constructing an electrical installation.
2. Construction of basic circuits.
3. Construction of a 1ph electrical switchboard.
4. Presentation of automation materials.
5. Construction of basic industrial automation circuits.
6. Connection the automation circuits with motor circuits.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face in-class lecturing, Laboratory exercises
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Slides (ppt) of the presentation of the theoretical part of the course, which will be available from the beginning of semester through e-Class. • Guidelines for the laboratory exercises (one per exercise), which will be available from the beginning of the semester through e-Class. • Support of teaching procedure through the e-Class platform (notification of the teaching procedure, distribution of slides, supplementary material, announcements, relative links and literature, provision of test and the final examination)

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	39
Practical examples and exercises – focusing on problem solving	13
Laboratory practice	13
Laboratory reports	20
Study and analysis of bibliography	40
Course Total	***125 hours (5 ECTS)***

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.

Evaluation language: Greek

Theory Grade
Final exams grade (short answer questions, problem solving): 100%
Intermediate exams grade (short answer questions, problem solving): 0%

Laboratory Grade
Final laboratory exam grade: 60%
Laboratory oral examination grade: 40%

The final grade is the weighted result of the grades of theory and Laboratory. Minimum pass grade 5/10.

(5) ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

1. Β. Μπιτζιώνης, Βιομηχανικές Εγκαταστάσεις, Εκδόσεις Τζιόλα, 2015.
2. Β. Μπιτζιώνης, Ηλεκτρικές Εγκαταστάσεις Κτιρίων, , Εκδόσεις Τζιόλα, 2015
3. Σ. Τουλόγλου, Β.Στεργίου, Ηλεκτρικές Εγκαταστάσεις, Εκδόσεις Ιων, 2008
4. Σ. Τουλόγλου, Ειδικές Εγκαταστάσεις Μεγάλων Κτιρίων, Εκδόσεις Ιων, 2003
5. Μ.Μόσχοβιτς, Εσωτερικές Ηλεκτρικές Εγκαταστάσεις, Εκδόσεις Ευγενίδου,, 1990
6. Α.Φάκαρου, Εσωτερικές Ηλεκτρικές Εγκαταστάσεις, Εκδόσεις Ευγενίδου,, 1990
7. Α.Γούτη, Το Ηλεκτρολογικό Σχέδιο, Μέρος Ι και ΙΙ, Εκδόσεις Ιων, 2004
8. G.Seip, Ηλεκτρικές Εγκαταστάσεις, Εκδόσεις Τζιόλα, 2004
9. Β. Στεργίου, *Ηλεκτρικές μηχανές συνεχούς ρεύματος*, Εκδόσεις Ίων, 1999.
10. Σ. Τουλόγλου, *Ηλεκτρικές μηχανές συνεχούς και εναλλασσόμενου ρεύματος*, Εκδόσεις Ίων, 1999.

- *Related academic journals:*

1. IEEE Transactions on Energy Conversion
2. IET Proceedings – Electric Power Applications
3. Electric Power Systems Research, Elsevier
4. Applied Energy, Elsevier
5. Energy Systems, Springer