EEE.7-1.4 Industrial Electrical Installations

COURSE OUTLINE

(1) GENERAL

SCHOOL	ENGINEERING SCHOOL		
DEPARTMENT	ELECTRICAL AND ELECTRONICS ENGINEERING		
LEVEL OF STUDIES	UNDER GRADUATE		
COURSE CODE	**EEE.7-1.4**	SEMESTER	7
COURSE TITLE	**Industrial Electrical Installations**		

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	
Laboratory Exercises	2	
Total	5	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialization Course
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek (official)
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	www.eee.uniwa.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 course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire upon successful completion of the course are :

- to get familiar with the main types of low voltage (LV) industrial electrical installations and the relative regulations applied
- to be able to design low voltage industrial electrical installations & to study drawings concerning low voltage industrial electrical installations and comprehend terms and specifications of them
- to know the hardware, circuits and devices needed for constructing a LV industrial electrical installation and the specifications which have to satisfy
- to understand the calculations which have to be made and the selection criteria which have to be applied in order to have the optimum selection, construction and synthesis of the above components
- to be familiarized with earthing and protection devices of an LV industrial electrical installation
- to understand how electrical energy from a supply company is distributed to an industry

The objective of the laboratory part is for the student :

- to be familiarized with (classic & using PLC) automation circuits for electrical motors
- to understand the operation of an (classic & using PLC) automation circuit for electrical motors
- to Know how an (classic & using PLC) automation circuit for electrical motors is designed and constructed
- to be able to recognize the components of an (classic & using PLC) automation circuit for electrical motors
- to be able to carry out the necessary inspections & testing in an (classic & using PLC) automation circuit for electrical motors

Upon completion of the course, students will be able to:

1. Acquire the knowledge and understanding of issues related to LV industrial electrical installations as well (classic & using PLC) an automation circuit for electrical motors in general.
2. Perceive, interpret and clearly explain issues related to LV interior industrial electrical installations as well (classic & using PLC) automation circuits for electrical motors.
3. Use all the concepts related to LV industrial electrical installations as well as (classic & using PLC) automation circuits for electrical motors, provide new calculations, be able to correctly classify the causes of the various problems and generate new knowledge, while gaining implementation experience.
4. Revise old views related to LV industrial electrical installations as well as (classic & using PLC) automation circuits for electrical motors, so they can create new knowledge. Also, be able to compose and organize working groups and propose solutions.
5. Participate in measuring-experimental procedures for LV industrial electrical installations as well as (classic & using PLC) automation circuits for electrical motors. Know to handle

suitable measuring devices and also be able to evaluate measurements results in order to judge situations correctly, proposing the appropriate solution in each case.

6. Work with their fellow students, in order to create and present, both at individual and group level, a case study from its initial stages up to final evaluation, and finally be able to propose new ideas and solutions.

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?

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
……
Others…
…….

The course aims at fostering the following capabilities:

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Production of free, creative and inductive thinking

(3) Course Content

A. THEORY

The theory part of the course consists of the following modules:

1. Introduction to Industrial Electrical Installations
2. Standards & Regulations for Industrial Electrical Installations.
3. Medium Voltage Cables
4. Cables Overload Calculations (according VDE 298 & Directive No26 of Public Power Corporation of Greece).
5. Protection & Safety of Medium Voltage Electrical Installations
6. Grounding / Earthing Systems for Industrial Electrical Installations
7. Power Factor compensation in Industrial Electrical Installations
8. Medium Voltage Panel Boards
9. Medium Voltage Substations for Industrial Electrical Installations

B. LABORATORY

The Laboratory part of the course consists of the following separate modules:

- Introduction to automation circuits for electrical motors
- Design & Construction of Classic Automation Circuits for electrical motors
- Introduction to PLC
- Design & Construction of Automation Circuits using PLC for electrical motors

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Lectures and exercises, face-to-face. Distance education (auxiliary way)
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Teaching using ICT, Laboratory Education using ICT, Communication and Electronic Submission
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
Laboratory Exercises	26
Preparation for Homework on case studies (individual or group work)	59
Personal study	26
Course Total	**150**

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.*	Written examination: 60% • problem solving • short-answer questions, open-ended questions Laboratory exercise: 40% • oral examination • written work

(5) ATTACHED BIBLIOGRAPHY

1. Bitzionis, V "Industrial Electrical Installations", 2011, Editions Τζιόλας (in Greek)
2. Kokkinos D. "Foundational Grounding", 2008, Editions ELEMKO (in Greek)
3. Gunter G. Seip, "Electrical Installations", 2004, Editions TZIOLA, (in Greek)
4. Panagiotopoulos N. "Γειώσεις Βιομηχανικών – Επαγγελματικών Κτιρίων και Κατοικιών, 2004, Editions PAPASOTIRIOU (in Greek)
5. Dokopoulos P. "Consumers Electrical Installations", 2005, Editions ZITIS (in Grreek)
6. Touloglou S., Stergiou V. "Electrical Installations", 2008, Editions ION (in Greek)
7. Michalis P. "Electrical Installations", 2007, Editions ION (in Greek)
8. Kimoulakis N. "Building Electrical Installations",, 2006, Editions PAPASOTIRIOU (in Greek)
9. Sarris G. "Check of Building Electrical Installations", 2011, Editions PAPASOTIRIOU (in Greek)
10. Touloglou S., "Industrial Electrical Installations & Substations", 2010, Editions ION (in Greek)
11. Lecturer Notes (in Greek)