COURSE OUTLINE

(1) GENERAL

SCHOOL	ENGINEERING		
ACADEMIC UNIT	ELECTRICAL AND COMPUTER ENGINEERING DEPT.		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**ECE_ENE940**	**SEMESTER**	**9**
COURSE TITLE	Electric Motor Drive Systems		

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	
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (4).	4	5

COURSE TYPE *general background, special background, specialised, general knowledge, skills development*	Special Background, Skill Development
PREREQUISITE COURSES:	No. Students are advised to have already attended the courses: Power Electronic I&II, Electrical Machines, Physics, Automatic Control Systems
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 aim of this course is to study an overall electromagnetic system from beginning to end. It is important for an Electrical Engineer to be able to calculate himself the forces applying on a load and to determine the conditions necessary for the operation of such a system. Knowing the aforementioned, the student should be in a position to choose the appropriate motor and Power Electronic Converter, to affect on the electromechanical dimensions. The proper operation of the above system can only be realized with proper control.

With this lesson the engineer uses all his/her knowledge and understands in-depth the importance of the multitude of subjects he/she has been taught so far through practical applications. Thus, the engineer prepares to take on practical projects on the market, as through realistic/real examples he/she chooses the basic parametric/structural elements of a complete system of electric motion as if he/she were working in industry.

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…*
	…….

- Decision making
- Work in an international environment
- Work in an Interdisciplinary environment
- Development of new research ideas
- Respect to the natural environment
- Criticism and self-criticism
- Promotion of free, creative and inductive thinking

(3) SYLLABUS

Theory

1st lecture: Description of the structure of an electric motor drive system.

2nd and 3rd lecture: Mechanical Forces – torque – friction calculation.

4th lecture: Motion transmission mechanisms (clutch – brake etc.).

5th and 6th lecture: Electrical Machines sort brief, torque – speed relation and stability of electromechanical systems. System acceleration – slow down – inertia.

7th lecture: Electromechanical system heating issues.

8th and 9th lecture: Selection of the proper power electronic converter for a drive system.

10th and 11th lecture: Usually used control methods in electromechanical drive systems.

12th and 13th lecture: Exercises in complete electrical motor drive systems.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In lecture
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Support of learning process through the platform “e-class” (lectures and communication)

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	20
Study of lectures and bibliography	66
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.

I. Theory:

- Written final exam (90% of theoretical grade) which involves theoretical questions and exercises.
- Two unannounced tests (10% of theoretical grade) involving theoretical questions and exercises

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Π. Μαλατέστα, *Ηλεκτρική κίνηση*, Εκδόσεις Τζιόλα, 2010.

R. Krishnan, *Ηλεκτρικά κινητήρια συστήματα*, Εκδόσεις Κλειδάριθμος, 2009.

Π. Μαλατέστα, *Φροντιστηριακές ασκήσεις ηλεκτρικής κίνησης*, Εκδόσεις Τζιόλα, 2010.

Αθανάσιου Ν. Σαφάκα, Ηλεκτρικά Κινητήρια Συστήματα, Ο.Ε.Δ.Β. Αθήνα 1985.