

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Naval Architecture		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	NAOME1221	SEMESTER	4 th
COURSE TITLE	FUNDAMENTALS OF ELECTRICAL ENGINEERING		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	CREDITS (ECTS)
Lectures		2	5
Laboratory		2	
Total		4	
COURSE TYPE <i>general background, specialbackground, specialised general knowledge, skills development</i>	Special background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/courses/NA210/		

(2) COURSE GOALS / LEARNING OUTCOMES

The main objective of the course is to introduce students to the fundamental principles of electrical engineering, focusing on basic electric circuit theory (including circuit elements, Kirchhoff's laws, etc), three-phase power systems, electric machines (DC motor/generator, synchronous AC generator) and their operation principle. Furthermore, students are also introduced to motor starting techniques, motor selection and to electrical hazards.

(3) COURSE CONTENT / SYLLABUS

- Basic circuit elements and circuit topology, Kirchhoff's first law, Kirchhoff's second law, Thevenin theorem, Norton theorem, Rosen-Kennely theorem
- Typical circuits employed in electronics (voltage /current divider, Wheatstone bridge), RLC circuits (transient response)
- AC circuit theory (sinusoidal steady state analysis, phasors, complex impedance, active/reactive/apparent power, power factor)
- Three-phase power systems (symmetric three-phase power systems, three-phase Y and Delta configurations)
- DC electric machines (series/shunt wound DC motor/generator, appropriate equivalent circuit models)
- AC electric machines (asynchronous motor, synchronous generator, appropriate equivalent circuit models, motor starting configurations, selection of an AC motor, parallel operation of generators, electrical hazards and protection)

Laboratory: Apart from the 2h weekly instructions, the specific module incorporates also a laboratory part where students have the opportunity to perceive practically the key principles introduced at lectures, by performing appropriate “hands-on” exercises.

(4) TEACHING and LEARNING METHODS - EVALUATION

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	<ul style="list-style-type: none"> • Use of ICT in teaching • Use of specialized Laboratory equipment • Asynchronous e-learning support through “Open eClass” platform 	
TEACHING METHODS <i>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</i>	Activity	Workload (hours)
	Lectures	26
	Laboratory exercises – Laboratory technical reports	26
	Study of Lectures	78
	Course total	130
STUDENT PERFORMANCE EVALUATION <i>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</i>	<p>Lectures:</p> <p>Final written examination (75%)</p> <p>Laboratory:</p> <ul style="list-style-type: none"> - Written examination (20%) - Laboratory technical reports (5%) 	

(5) ATTACHED BIBLIOGRAPHY

1. Ηλεκτροτεχνικές εφαρμογές σε πλοία και πλωτές κατασκευές, Ι. Προυσαλίδης, εκδόσεις Συμμετρία, 2012
2. Τεχνολογίες πληροφορικής και επικοινωνιών στη ναυτιλία, Δ. Κόκοτος, Δ. Λιναρδάτος, Ν. Νικητάκος, Ε. Τζανάτος, εκδόσεις Σταμούλη Α.Ε., 2011
3. Θέματα Ηλεκτρονικής τεχνολογίας στη Ναυτιλία και τις μεταφορές, Ν. Νικητάκος – Γ. Ντούρμας, Εκδόσεις Ι. Σιδέρης, 2011
4. Practical marine electrical knowledge, D. T. Hall, Witherby, 1999
5. Hughes electrical and electronic technology, E. Hughes, 2016, Pearson
6. Electrical circuit theory and technology, J. Bird, 2003, Newnes
7. Electric machinery fundamentals, S.J. Chapman, 2012, McGraw-Hill
8. Journal of Marine Science and Application, ISSN: 1671-9433
9. Journal of Marine Science and Technology, ISSN: 0948-4280
10. Transactions of the Society of Naval Architects and Marine Engineers [S.N.A.M.E.], ISSN: 0081-161
11. SAE Technical papers, ISSN: 0148-7191