

Faculty of Maritime Studies / MARINE ELECTRICAL ENGINEERING / BASICS OF MARINE ELECTROTECHN. AND ELECTRONICS I

Course:	BASICS OF MARINE ELECTROTECHN. AND ELECTRONICS I			
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exercises+Laboratory)
10242	Mandatory	1	5	2+1+1
Programs	MARINE ELECTRICAL ENGINEERING			
Prerequisites	There are no special requirements.			
Aims	To familiarize students with basic laws and principles in electrical engineering and electronics necessary for more further study levels, considering STCW10 convention (Table A-III/6) and IMO model course 7.08 (paragraphs 1.1.3.3, 1.1.3.4, 1.1.3.7, 1.1.4.1, 1.1.9.6, 2.1.6.6.1 and Ap. 6: 1.10)			
Learning outcomes	Upon successful completion of this subject the student will be able to: - Define and apply all laws on alternating (mono-phase and three-phase) electrical and electric circuits, - Define and apply the principles of operations of transistors (BJT, FET, MOSFET, IGBT) as well as their relevant circuits - Analyse and calculate complex circuits of alternating current, as well as electronic diodes circuits, transistors and amplifiers, - Plan and perform measurements on alternating current circuits and electronic diodes circuits, transistors and amplifiers, - Be familiar with all relevant precautions for working with alternating current.			
Lecturer / Teaching assistant	Associate professor Tatijana Dlabac, PhD; Teaching assistant Ivana Čavor			
Methodology	Lectures, exercises, laboratory exercises, homeworks, tests, consultations and individual work.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Magnetic field. Electromagnetic force. Electromagnetic induction. (7.08 Ap. 6: 1.10), (7.08 1.1.3.4)			
I week exercises				
II week lectures	Magnetic flux. States Faradays law. States Lenzs law. Self and mutual induction. (7.08 1.1.3.4)			
II week exercises				
III week lectures	Magnetic materials. Magnetic circuit. Transformers - working principles. (7.08 1.1.9.6), (7.08 1.1.3.7)			
III week exercises				
IV week lectures	Magnetic circuit energy. Solving magnetic circuit.			
IV week exercises				
V week lectures	Alternating circuit - Introduction. Differences between AC and DC. R.m.s. and mean value of alternate current and voltages. Craft vector, phasors diagram. Power in alternating circuit. Power factor. Measurements. (7.08 1.1.3.3)			
V week exercises				
VI week lectures	Test I			
VI week exercises				
VII week lectures	Analysis of the basic elements of R, L and C. Impedance. (7.08 1.1.3.3)			
VII week exercises				
VIII week lectures	Analysis of RL and RC circuits. Vector diagram. Phasors. (7.08 1.1.3.3)			
VIII week exercises				
IX week lectures	RLC circuit and resonance. Complex analysis method. (7.08 1.1.3.3)			
IX week exercises				
X week lectures	The system of three-phase alternating current. Three phase power. (7.08 1.1.3.3)			
X week exercises				
XI week lectures	Measurement of AC current . Measuring of electric power. (7.08 1.1.3.3)			
XI week exercises				
XII week lectures	RL, RC and RLC circuits in transient states. (7.08 1.1.3.3)			
XII week exercises				

XIII week lectures	Test II					
XIII week exercises						
XIV week lectures	Transistors, thyristors, amplifiers circuits. (7.08 1.1 4.1)					
XIV week exercises						
XV week lectures	Filters, voltage stabilizers, amplifiers, integral circuits. (7.08 2.1.6.6.1)					
XV week exercises						
Student workload	Per week 5 credits x 40/30 = 6 hours and 40 minutes Structure: 2 hours of lectures 1 hours of exercises 1 hours of practical exercises 2 hour and 40 minutes of individual work including consultations During the semester Teaching and final exam: (6 hours and 40 minutes) x 16 = 106 hours and 40 minutes Necessary preparations before the semester start (administration, enrolment, verification): 2 x (6 hours and 40 minutes) = 13 hours and 20 minutes Total hours: 5 x 30 = 150 hours Remedial classes (additional hours) for preparing the make-up exam, including the exam (0 to 30). Total workload structure: 106 hours and 40 minutes (lectures) + 13 hours and 20 minutes (preparation) + 30 hours (remedial classes)					
Per week			Per semester			
5 credits x 40/30=6 hours and 40 minuts 2 sat(a) theoretical classes 1 sat(a) practical classes 1 excercises 2 hour(s) i 40 minuts of independent work, including consultations			Classes and final exam: 6 hour(s) i 40 minuts x 16 =106 hour(s) i 40 minuts Necessary preparation before the beginning of the semester (administration, registration, certification): 6 hour(s) i 40 minuts x 2 =13 hour(s) i 20 minuts Total workload for the subject: 5 x 30=150 hour(s) Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) 30 hour(s) i 0 minuts Workload structure: 106 hour(s) i 40 minuts (courses), 13 hour(s) i 20 minuts (preparation), 30 hour(s) i 0 minuts (additional work)			
Student obligations			Students are required to attend classes, do homeworks and make final exam(s).			
Consultations						
Literature			Books: 1. Lister Eugene, Rusch Robert, Electric circuitsandmachines, McGraw, ISBN:9780028018096. 2. REEDs Volume 7: Advanced electrotechnology for engineers. 2nd Ed., KRAAL, E.G. I London, Adlard Coles Nautical, 2008. LITERATURE: 1. G. Joksimović: F			
Examination methods			1. Test I, up to 15 points; 2. Test II, up to 20 points; 3. Homework and tests, up to 8 points; Laboratory exercises 0 - 22 points; 5. Final exam, 0 - 35 points; Positive mark requires not less than 50 points cumulatively.			
Special remarks						
Comment						
Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points