Faculty of Maritime Studies / MARINE ELECTRICAL ENGINEERING / MARINE ENGINEERING DRAWINGS

Course:	MARINE ENGINEERING DRAWINGS			
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
8483	Mandatory	3	3	1+0+2
Programs	MARINE ELECTRICAL ENGINEERING			
Prerequisites	No prerequisites for course enrolment and attending			
Aims	To introduce students with basic elements of technical drawing, computer and engineering graphics considering STCW'10 and IMO model course 7.04 (Items 3.2.6. and 3.2.7)			
Learning outcomes	1. Describe and analyze the elements of the technical drawing and to interpret it adequately (ISO, DIN, MNE standards). 2. Distinguish different types of technical drawings and sketches. 3. Create a sketch, technical drawing of an engineering elements in orthogonal projection. 4. Create 2D and 3D graphic elements using AutoCAD. 5. Defining of sections as well as understand dimensioning and tolerances, marks of roughness in technical drawings. 6. Define and interpret ship's technical documents.			
Lecturer / Teaching assistant	Doc. dr Špiro Ivošević, teacher			
Methodology	Lectures, computer exercises, consultations, homework, tests.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Introduction. Engineering and Computer Graphics. Different types of technical drawings.			
I week exercises	Fundamentals of computer science. Basic computer devices, organization and architecture. Basics of Word, Excel and the Internet.			
II week lectures	Technical drawings and sketching.			
II week exercises	Sketching plane and spatial objects.			
III week lectures	Materials, equipment and basic elements of technical drawing. Formats and ratio.			
III week exercises	Sketching isometric objects. First graphic work.			
IV week lectures	The rules, regulations and recommendations in liaison with ISO and DIN standards in creating technical drawings.			
IV week exercises	Basics of programming language AutoCAD. The main elements of the program, planning and adjustment of the working environment, basic settings.			
V week lectures	Introduction to the projection design. Basics of programming language AutoCAD - 2D graphics.			
V week exercises	Basic geometric shapes performance and draw by using tools from the Draw toolbar. Creating a baseline projections. Second graphic work.			
VI week lectures	Basic rules of orthogonal and axonometric projection design.			
VI week exercises	Modifying and performance of basic transformation on the objects in the plane. Creating a basic orthogonal projection.			
VII week lectures	Basic settings in 3D graphics. Computer Aided Drafting and modeling of three-dimensional objects.			
VII week exercises	Creating, defining and using level-layers. Defining hatching.			
VIII week lectures	Development of cross-section.			
VIII week exercises	Dimensioning. Entering text. Printing of formed objects. First colloquium.			
IX week lectures	Dimensioning of technical drawings (quotation).			
IX week exercises	Understanding AutoCAD advanced tools and their application. Basic settings 3D graphics.			
X week lectures	Tolerances on shape and dimensions. Indicating surface.			
X week exercises	Understanding of three-dimensional objects and orientation in space. Defining user coordinate system. Third graphic work.			
XI week lectures	Displaying the standard parts.			
XI week exercises	Defining the surface of objects.			

XII week lectures	The engineering drawings in practice. Understanding the scheme, drawings and diagrams.
XII week exercises	Defining volume-solid objects. Defining section. Fourth graphic work.
XIII week lectures	Technical documentation before and during the ship's construction.
XIII week exercises	The system spatial transformation of the created models.
XIV week lectures	Interpretation of the ship documents and technical drawings.
XIV week exercises	Examples ship's technical drawings. Understanding schemes of marine engineering simulators.
XV week lectures	Ship's documents and books.
XV week exercises	Examples ship's documents and books on different types of ships. Preparation for the test. Second colloquium.
Student workload	IN SEMESTER Teaching and final exam: (6 hours and 40 minutes) x 16 weeks = 106 hours and 40 minutes Necessary preparation before the start of the semester (administration, registration verification) 2 x 6 hours and 40 minutes = 13 hours and 20 minutes Total hours for the course: 5 x 30 hours = 150 hours Additional work: For exam preparation of additional final exam , including the exam taking 150 hours – (106 hours and 40 minutes +13 hours and 20 minutes) = 30 hours Load structure 106 hours and 40 minutes (teaching) + 13 hours and 20 minutes (preparation) + 30 hours (additional work)

Per week	**Per semester**
3 credits x 40/30=4 hours and 0 minuts 1 sat(a) theoretical classes 2 sat(a) practical classes 0 excercises **1 hour(s) i 0 minuts** of independent work, including consultations	Classes and final exam: **4 hour(s) i 0 minuts x 16 =64 hour(s) i 0 minuts** Necessary preparation before the beginning of the semester (administration, registration, certification): **4 hour(s) i 0 minuts x 2 =8 hour(s) i 0 minuts** Total workload for the subject: **3 x 30=90 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) **18 hour(s) i 0 minuts** Workload structure: **64 hour(s) i 0 minuts (cources), 8 hour(s) i 0 minuts (preparation), 18 hour(s) i 0 minuts (additional work)**
Student obligations	Students have the mandatory graphic works and the possibility to take the two tests.
Consultations	Monday and Wednesday from 11 to 13.
Literature	1. The Marine Engineers graphics script (workbook): R. Vukasojević, Š. Ivošević; 2. Pantelić T.: Technical drawing; 3. James H. Earle: Engineering Design Graphics; 4. Roy Plastock, Gordon Kalley: Computer Graphics; 5. George Omura: AutoCAD 2009.
Examination methods	During the learning process the student has the ability to collect a total of 100 points as follows: The presence of teaching (a total of 2 points); four graphics works (8 points); two tests (30 points); final exam (30 points). The passing grade is obtain
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