

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Naval Architecture		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	NAOME1328	SEMESTER	5 th
COURSE TITLE	LONGITUDINAL STRENGTH OF SHIPS		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	CREDITS (ECTS)
Lectures		4	5
COURSE TYPE <i>general background, specialbackground, specialised general knowledge, skills development</i>	Specialized general knowledge		
PREREQUISITE COURSES:	NAOME1103 - Mechanics I		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSEWEBSITE(URL)	https://eclass.uniwa.gr/courses/NA187/		

(2) COURSE GOALS / LEARNING OUTCOMES

The subject of this course is the longitudinal strength of the ship, when her hull is considered as a girder subjected to several static and dynamic loads. After a description of the several types of loads exerted on the hull girder, extensive reference is made to the calculation of the bending moment and shear force diagrams along the hull girder. Also, the course is focused on the calculation of the normal stresses due to hull bending and the distribution of the shear stresses due to the applied shear forces. As a special loading, the torsion of the hull girder is also considered and the resulted shear stresses due to torsion are calculated. In the context of the course, the calculation of the thermal stresses due to the carriage of heated cargoes is also considered. Finally, the Class requirements for the integrity of the hull girder are analyzed.

The aim of the course is the familiarization of the students with the assessment of the Longitudinal Strength of ships. Upon the successful completion of the course, the students will be in position to:

- Calculate the bending moments and shear forces along the hull girder.
- Calculate normal stresses due to bending.
- Calculate shear stresses due to shear forces and torsional moments.
- Assess the hull girder structural integrity.
- Understand the content of the ship's Loading Manual.
- To design safe loading conditions for ships and to prepare Loading Manuals.

(3) COURSE CONTENT / SYLLABUS

- Description of loads exerted on the hull-structure
- Assessment of weight and buoyancy distributions
- Construction of bending moment and shear force diagrams
- Assessment of normal stresses due to bending
- Assessment of shear stresses due to shear forces
- Assessment of shear stresses due to torsion
- Assessment of Midship Section integrity.
- Calculation of thermal stresses
- Influence of superstructures on the vessel's longitudinal strength.
- Loading Manual

(4) TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;">DELIVERY</p> <p style="text-align: center;">Face-to-face, Distance learning, etc.</p>	Face-to-face	
<p style="text-align: center;">USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</p> <p style="text-align: center;">Use of ICT in teaching, laboratory education, communication with students</p>	<ul style="list-style-type: none"> • Development of useful worksheets • Training material is distributed in electronic format. 	
<p style="text-align: center;">TEACHING METHODS</p> <p><i>The manner and methods of teaching are described in detail.</i></p> <p><i>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.</i></p> <p><i>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></p>	Activity	Workload (hours)
	Lectures	52
	Homework assignments	48
	Personal Study	43
	Course total	143
<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION</p> <p><i>Description of the evaluation procedure</i></p> <p><i>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>	<p>Weight of final exams: 60%</p> <p>Weight of exercises: 40%</p>	

(5) ATTACHED BIBLIOGRAPHY

Books

- Alan Mansour, Donald Liu: The Principles of Naval Architecture Series-Strength of Ships and Ocean Structures, 2008
- J. Eyres, "Ship Construction", Butterworth-Heinemann, 5th Ed., 2001
- Tupper, "Introduction to Naval Architecture", Butterworth-Heinemann, 3rd Ed., 2002
- Owen Hughes & J.K. Paik, "Ship Structural Analysis and Design"

Indicative Journals

- Marine structures, ELSEVIER
- Journal of Ship Research, SNAME
- Marine Technology, SNAME