COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Naval Architecture		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	NAOME1326	**SEMESTER**	5th
COURSE TITLE	**SHIP PROPULSION PLANTS**		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS (ECTS)**
Lectures and case studies		2	5
Laboratory exercises		2	
Total		4	
COURSE TYPE *general background, specialbackground, specialised general knowledge, skills development*	Specialised		
PREREQUISITE COURSES:	NAOME1223 - INTERNAL COMBUSTION ENGINES		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/courses/NAFP117/		

(2) COURSE GOALS / LEARNING OUTCOMES

This course aims initially to cover the way in which a suitable propulsion engine is selected for each ship, and then to provide with the study of the behavior of the different engines as well as the way in which they are installed and used on board. Also the characteristics for Diesel and Natural Gas motors of the various types available are presented, as well as the auxiliary machinery necessary for their operation on a ship. The course includes the study of the entire shafting system that moves the propeller in torsional vibrations. Finally, the aim of the course is to educate students on the procedures and protocols of the testing and approval of operation of ships' main and auxiliary engines.

(3) COURSE CONTENT / SYLLABUS

1. Classification and description of ship propulsion installation.
2. Selection of Ship Main Engine
3. Engine / Propeller Cooperation
4. Seating of Ship Main Engine
5. Design and analysis of the shafting system of a ship.
6. Axial Torsional Vibration Analysis.
7. Basic Elements of Dynamic Diesel Engines.
8. Reliability and Maintenance of Propulsion Installations.
9. Financial Performance Analysis of Propulsion Installations.
10. Testing and approval of ship main and auxiliaries engines
11. Pollution-control systems for Ship main and auxiliaries engines
12. Laboratory Exercises (on the four-stroke experimental naval engine of the Department):

A) Basic Principles and Protocols for Testing Naval Engines
B) Exercise on Torque Measurement on the Axis
C) Exercise on Vibration Measurement.
D) Exercise on Noise Measurement
E) Exercise on Gas Exhaust Gas Measurement
F) Exercise on measurement of functional characteristics and drawing of thermal balance.

(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	• Use of ICT in teaching. • Support learning through the electronic e-class platform.
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*	
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*	i) Written final examination (70%) that includes solving problems related to the theory. ii) Evaluation of technical group work reports (30%). The grade corresponding to each technical report will be available to the student on the e-class platform.

Activity	*Workload (hours)*
Lectures	26
Project case study – design of propulsion installation	26
Laboratory exercises on real Diesel Engine	26
Technical essays	26
Personal study	26
Visits	13
Course total	**143**

(5) ATTACHED BIBLIOGRAPHY

1. A. J. Martyr M A PLINT, Engine Testing , Theory and Practice, 3rd Edition, Butterworth-Heinemann, 2007
2. John Carlton, Marine Propellers and Propulsion, 3rd Edition, Butterworth-Heinemann, 2012
3. D. A. Taylor, Introduction to Marine Engineering, 2nd edition, Elsevier
4. D. Woodyard, Pounder;s Marine Diesel Engines and Gas Turbines, Elsevier
5. Roy L. Harrington, Marine Engineering, SNAME, 1992
6. Indra Nath Bose, Energy Efficiency and Ships, SNAME , 2012