COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering
ACADEMIC UNIT	Department of Naval Architecture
LEVEL OF STUDIES	Undergraduate

COURSE CODE	NAOME1345	**SEMESTER**	7th

COURSE TITLE	**CORROSION OF MATERIALS – PROTECTION AND MAINTENANCE OF NAVAL STRUCTURES**

INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS (ECTS)**
	Lectures	3	4

COURSE TYPE *general background, specialbackground, specialised general knowledge, skills development*	Specialized
PREREQUISITE COURSES:	NAOME1213 - NAVAL MATERIALS TECHNOLOGY
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (English)
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/courses/NA226/

(2) COURSE GOALS / LEARNING OUTCOMES

The aim of the course is to familiarize the students with :

- The principles of electrochemistry.
- The mechanisms of corrosion in metals.
- The thermodynamic aspects of corrosion.
- The kinetics of corrosion.
- The various forms of corrosion.
- The various methods of protection against corrosion.
- The use of anti-corrosive technology.
- The protection of naval and marine structures against corrosion.
- The survey and maintenance of naval and marine structures.
- The current trends and developments in the area of corrosion science and engineering.

(3) COURSE CONTENT / SYLLABUS

Lectures:

- An overview of the corrosion process.
- Electrochemistry (oxidation and reduction half reactions, electrochemical potential, galvanic cells, Faraday's law).
- Thermodynamics of corrosion (equilibrium electrochemistry, Nernst equation,

Reference electrodes, Pourbaix diagrams).
- Kinetics of corrosion (corrosion rate, polarization, overpotential).
- Forms of corrosion.
- Corrosion of shipbuilding materials.
- Corrosion in ship and marine structures.
- Anti-corrosive protection (design, cathodic protection, SACP, ICCP, passivity, protecting coatings, inhibitors and passivators).
- Marine coatings and paints.
- Survey and maintenance of naval structures.

(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	• Communication with students and support of learning procedure 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*	*Activity*	*Workload (hours)*
	Lectures	39
	Study of Lectures and Homework assignments	78
	Course total	**117**
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*	Written examination (100%)	

(5) ATTACHED BIBLIOGRAPHY

Suggested readings:

1. E. McCafferty, "Introduction to Corrosion Science", Springer edition, London, 2009.
2. R. Revie, H. Uhlig, "Corrosion and Corrosion Control. An Introduction to Corrosion Science and Engineering, 4th edition, Wiley Interscience, New York, 2008.
3. R. Singh, "Corrosion control for offshore structures", Elsevier, 2014.
4. D.A. Bayliss and D.H. Deacon, "Steelwork corrosion control", Spon Press, 2002.
5. P.R. Roberge, "Corrosion Engineering. Principles and Practice", McGraw-Hill,

New York, 2008.

Journals and other material:

1. *Corrosion Science*, Elsevier. *www.journals.elsevier.com/corrosion-science*
2. *Materials and Corrosion*, Wiley. *https://onlinelibrary.wiley.com/journal/15214176*
3. *Journal of Corrosion Science and Engineering. www.jcse.org*
4. *Corrosion Engineering, Science and Technology, www.tandfonline.com/toc/ycst20/current*