COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Naval Architecture		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	NA0ME1358	**SEMESTER**	8nd
COURSE TITLE	**RISK ASSESSMENT AND RISK MANAGEMENT IN SHIPPING**		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS (ECTS)**
Lectures		3	4
COURSE TYPE *general background, specialbackground, specialised general knowledge, skills development*	Specialised		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/courses/NA237/		

(2) COURSE GOALS / LEARNING OUTCOMES

The need for implying risk assessment and management methodologies in the Shipping Sector stems from the International Safety Code (ISM Code) established by the International Maritime Organization and widely applied worldwide. Also in recent years, the major oil companies in order to charter ships demand from the Shipping Companies all their activities / operations to be affirmed by corresponding risk analyses.

Based on the above, the need to familiarize the modern shipbuilding engineer with the methodologies of risk assessment and management becomes imperative today, and this familiarization is primarily aimed at this course.

Upon successful completion of the course the student will be able to:

- Identify and assess the basic risks related to shipping and shipbuilding.
- Understand the process and basic risk assessment techniques such as Failure Mode Effect and Critical Analysis and Fault Tree Analysis.
- Know the legislation on occupational safety at ship and shipyard (ISM, ISPS, ISGOTT, STCW) as well as modern risk assessment procedures (FSA, TMSA).
- Use the tools and techniques of risk management and be able to analyze the risks, consequences, actions to ensure the safe operation of the ship and shipyard.
- Manage real cases of danger on deck, in the engine room and in the yard.

Also, after successfully completing the course the student will become familiar with the

various techniques of incident investigation, which is widely used by shipping companies to investigate maritime accidents and draw useful conclusions for avoiding their recurrence.

(3) COURSE CONTENT / SYLLABUS

- Risk definition.
- Identification of hazards in Shipping (external factors, equipment errors, port operations, endogenous ship factors, cargo hazards, cabin hazards).
- The risk assessment process. Risk assessment techniques (Failure Mode Effect and Critical Analysis, Fault Tree Analysis, etc)
- Root Cause Analysis
- Consequence Analysis
- Risk categories - Risk treatment - Risk monitoring.
- Risk control measures
- Monitoring the effectiveness of control measures
- Work safety in the ship and the shipyard. Investigation of maritime accidents. Hazardous working conditions, safety of electrical installations, fire safety, safety of transport and storage, hazardous chemicals, special issues of various machines and installations.
- Legislation, codes and organizations related to work safety and accidents (ISM, ISPS, ISGOTT, STCW, etc.)
- Risk Based Technology (Formal Safety Assessment - FSA)
- Risk assessment in the TMSA (Tanker management and self-assessment) program.
- Study of the human factor in maritime accidents. Man as a source of danger. Improving human reliability in maritime transport. Occupational diseases, psychological effects of ship crews.
- Practical examples of cases from deck, engine room and working at ship and shipyard.

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Face-to-face</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>Training material is distributed in electronic format through e-class platform.</td></tr>
<tr><td>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,</td><td>
<table>
<tr><th>Activity</th><th>Workload (hours)</th></tr>
<tr><td>Lectures</td><td>26</td></tr>
<tr><td>Risk management projects</td><td>26</td></tr>
<tr><td>Team work on case study</td><td>26</td></tr>
<tr><td>Personal study</td><td>39</td></tr>
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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*	<table><tr><td></td><td></td></tr><tr><td>Course total</td><td>117</td></tr></table>
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*	Final written examination : 80% Technical essay: 20%

(5) ATTACHED BIBLIOGRAPHY

Books:

- Lurie, A.I., “Theory of elasticity”, Springer 2005
- Timoshenko, Gere “Theory of elastic stability”, McGraw Hill, 17th Ed., 1985.
- Boresi A.P. et al., , “Elasticity in Engineering Mechanics” John Wiley & Sons, 3rd Ed., 2011
- Γιαντές, Χ.Ι., “Μη-γραμμική συμπεριφορά των κατασκευών”, Εκδόσεις Κάλλιπος, 2015
- Beer, Johnston, Mazurek, Cornwell,Self, “Vector Mechanics for Engineers: Statics and Dynamics”, McGraw Hill, 2019.
- Russell C. Hibbeler, “Engineering Mechanics – Dynamics", Prentice Hall, 2006.
- D. G. Gorman, W. Kennedy, “Applied Solid Dynamics”, Butterworth-Heinemann, 1988

Journals:

- Journal of Mechanics, Cambridge University Press.
- European Journal of Mechanics, Elsevier.
- Journal of Applied Mechanics, ASME.