

COURSE OUTLINE

(1) General information

FACULTY/SCHOOL	MARITIME AND INDUSTRIAL STUDIES		
DEPARTMENT	MARITIME STUDIES		
LEVEL OF STUDY	UNDERGRADUATE		
COURSE UNIT CODE	NAATT26		7 th semester
COURSE TITLE	System Dynamics		
INDEPENDENT TEACHING ACTIVITIES <i>in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
		4	6
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail under section 4			
COURSE TYPE <i>Background knowledge, Scientific expertise, General Knowledge, Skills Development</i>	Background knowledge		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION:	English		
LANGUAGE OF EXAMINATION/ASSESSMENT:			
THE COURSE IS OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://eclass.unipi.gr/courses/NAS444/		

(2) LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail.

It is necessary to consult:

APPENDIX A

- Description of the level of learning outcomes for each level of study, in accordance with the European Higher Education Qualifications' Framework.
- Descriptive indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and

APPENDIX B

- Guidelines for writing Learning Outcomes

The course introduces students to systems thinking, a holistic approach of analyzing how the constituent parts of a system interrelate and how systems behave over time.

System Dynamics equips students with background knowledge on system analysis, going beyond traditional approaches, studying systems by breaking them down into their separate elements. With the use of simulation software, students are exposed to business modeling to analyze maritime-related systems obtaining valuable insights.

General Competences

Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?

<i>Search for, analysis and synthesis of data and information by the use of appropriate technologies,</i>	<i>Project planning and management</i>
<i>Adapting to new situations</i>	<i>Respect for diversity and multiculturalism</i>
<i>Decision-making</i>	<i>Environmental awareness</i>
<i>Individual/Independent work</i>	<i>Social, professional and ethical responsibility and sensitivity to gender issues</i>
<i>Group/Team work</i>	<i>Critical thinking</i>
<i>Working in an international environment</i>	<i>Development of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment</i>	<i>.....</i>
<i>Introduction of innovative research</i>	<i>(Other.....citizenship, spiritual freedom, social awareness, altruism etc.)</i>
	<i>.....</i>

Upon the completion of the module students will be able to:

- Collect and analyse data
- Use system dynamics methodologies and tools for analysing data
- Make swift decisions related to the maritime industry

(3) COURSE CONTENT

Week	Topic
1.	• Introduction
2.	• Systems Thinking
3.	• Complex Systems
4.	• The Beer Game I
5.	• The Beer Game II
6.	• Modeling Process
7.	• Structure and Behavior
8.	• Causal Loop Diagrams
9.	• Stock Flows
10.	• Mapping Stocks and Flows
11.	• Dynamics of Stocks and Flows
12.	• Delays and modeling decision making
13.	• Recap

(4) TEACHING METHODS--ASSESSMENT

MODES OF DELIVERY <i>Face-to-face, in-class lecturing, distance teaching and distance learning etc.</i>	In-class lecturing
USE OF INFORMATION AND COMMUNICATION	E-CLASS

TECHNOLOGY <i>Use of ICT in teaching, Laboratory Education, Communication with students</i>		
COURSE DESIGN <i>Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc.</i> <i>The study hours for each learning activity as well as the hours of self-directed study are given following the principles of the ECTS.</i>	Activity/Method	Semester workload
	Lectures	52
	Case studies analysis	10
	Individual or Team assignment	78
	Non-guided study	10
	Total	150
STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS <i>Detailed description of the evaluation procedures:</i> <i>Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work, other.....etc.</i> <i>Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.</i>	Group assignment	

(5) SUGGESTED BIBLIOGRAPHY:

<i>-Suggested bibliography:</i> ▪ J.D. Sterman (2000), Business dynamics: systems thinking and modeling for a complex world, McGraw-hill, Boston <i>Additional readers for course is:</i> None
