COURSE OUTLINE

1. GENERAL INFORMATION

SCHOOL	MARITIME AND INDUSTRIAL STUDIES		
DEPARTMENT	INDUSTRIAL MANAGEMENT AND TECHNOLOGY		
LEVEL OF STUDY	UNDERGRADUATE		
COURSE UNIT CODE	ΤΕΜΑΘ07	**SEMESTER OF STUDY**	2nd
COURSE TITLE	MATHEMATICS II		

INDEPENDENT TEACHING ACTIVITIES *in case in which credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures & Laboratory Exercises	4 +1	5.5
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at section 4.		

COURSE TYPE *general background, special background, specialized general knowledge, skills development*	General background
PREREQUISITE COURSES:	None
LANGUAGE OF INSTRUCTION and EXAMINATION/ASSESSMENT:	Greek (English in ERASMUS)
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://eclass.unipi.gr/courses/BDT161/

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 qualifications' cycle, according to the European Higher Education Area's Qualification Framework.*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and APPENDIX B*
- *Guidelines for writing Learning Outcomes*

The course is essentially a continuation of Mathematics I (1st semester) aiming at familiarizing students with the basic concepts of mathematics used in the other courses of the curriculum.

Upon successful completion of the course, the students will be able to:

- Solve first-order differential equations
- Study applications of differential equations in engineering, thermodynamics, kinetics, etc., relevant to the other subjects of the curriculum
- Estimate the independent solutions of a differential equation
- Solve higher order differential equations as well as systems of differential equations
- To use proper integrals and Laplace transformations in problems of mechanics, thermodynamics, kinetics, etc
- Use the Lagrange multiplier method to optimize function under constraints
- Use double and triple integrals in engineering problems
- know the concepts of sequence, series of real numbers and be able to use Taylor series

In order to attend the rest of the Department's courses with a computer part
- Demonstrate the skills necessary to attend other courses of the curriculum with a computing part
- Formulate and solve computer problems by using the mathematical tools taught in the course

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 aims

Search for, analysis and synthesis of data and information, by the use of technologies that are necessary according the case
Adapting to new situations
Decision-making
Independent work
Team work
Working in an international environment
Working in an interdisciplinary environment
Introduction of innovative research
Project planning and management
Respect for difference and multiculturalism
Environmental awareness
Social, professional and ethical responsibility and sensitivity to gender issues
Critical consciousness, criticism and self-criticism
Development of free, creative and inductive thinking

- Search for, analysis and synthesis of data and information, by the use of technologies that are necessary according the case
- Independent work
- Working in an interdisciplinary environment
- Social, professional and ethical responsibility and sensitivity to gender issues

3. COURSE CONTENT

The course will cover the following topics:
- Linear Differential equations and applications
- Proper integrals and Laplace Transformation
- Multivariable calculus: Limits, Continuity, Partial differentiation, Optimization, Optimization under constrictions (Lagrange multipliers), Multiple integration (double-triple)
- Generalized integration of univariate functions
- Double and triple integrals
- Sequences, Series of reals numbers, Taylor Series and applications
- Applications with Mathematica/Matlab/Octave.

In addition, articles, audiovisual lecture material, web addresses, useful information, exercises and software are posted at eclass.

4. TEACHING METHODS - ASSESSMENT

TEACHING MODE *Face-to-face, in-class lecturing, on distance teaching and distance learning etc.*	In-class lecturing
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY *Use of ICT in Teaching, Laboratory Education, Communication with students*	**Teaching:** Lectures with audiovisual media, support of the learning process through the eclass platform **Communication with students:** face-to-face at office hours, email, eclass
COURSE DESIGN *Description of teaching techniques, practices and methods:* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, clinical practice, Art Workshop, Interactive teaching, Educational visits, project, Essay writing, Artistic creativity, etc.*	

Activity / Method	***Semester Workload***
Lectures	52
Laboratory Exercises	13
Self-study of lecture material	57
Counselling	0.5
Exams (written)	2
Course Total	***137.5***

The study hours for each learning activity as well as the hours of non- directed study are given according to the principles of the ECTS	
STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS *Detailed description of the evaluation procedures:* *Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice questionnaires, short- answer questions, open-ended questions, problem solving, written work, Essay/report, oral exam, public presentation, laboratory work, art interpretation, other……etc* *Evaluation criteria are specifically defined and given as well as if and where they are reported and accessible to students.*	**Language of exams:** Greek (English in ERASMUS) **Assessment Methods:** After the last lecture, the exam material is posted at eclass. The final course grade is formed by the written exams (100%) taken in the examination period of the spring semester and, in case of failure, in the September resits. The written examination includes problem solving / exercises. It is conducted with closed books.The evaluation of students with special learning difficulties in writing and reading (as certified and qualified by a competent institution) is performed according to the relevant procedure decided by the Department Assembly. Students may also participate in a mid-term progress examination. In this case, the final grade is formed by the progress examination grade (20%) and the final exams grade (80%). **Notification of the Assessment Criteria:** The evaluation criteria are made known during the first lecture and are clearly stated on the course website and e-class. The answers to the exam questions are posted at eclass after the exam date. Students have the opportunity to discuss their exam paper with the course instructor (at the posted office hours) after the announcement of the course grades.

5. SUGGESTED BIBLIOGRAPHY

-Suggested Bibliography :

- Βιβλίο [68403139]: Apploed Analysis and Fourier Theory, M. Filippakis, Tsotras Publications, Athens 2017, 2nd Edition, ISBN 9786185066833

-Scientific Journals: not applicable

-Lecture Notes