COURSE OUTLINE

1. GENERAL

<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>Engineering</th>
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<tbody>
<tr>
<td>ACADEMIC UNIT</td>
<td>Department of Computer Engineering and Informatics</td>
</tr>
<tr>
<td>LEVEL OF STUDIES</td>
<td>Undergraduate</td>
</tr>
<tr>
<td>COURSE CODE</td>
<td>NY102</td>
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<tr>
<td>SEMESTER</td>
<td>Spring</td>
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<tr>
<td>COURSE TITLE</td>
<td>Mathematics II</td>
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INDEPENDENT TEACHING ACTIVITIES
if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits

| Lectures, Tutorials | 3 (L), 2(T) | 5 |

Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).

COURSE TYPE
- Specialised general knowledge, Skills development

PREREQUISITE COURSES:
There are no prerequisite courses. It is however recommended that students have at least a basic mathematical background, and prior involvement with the course “Mathematics I” (NY101)

LANGUAGE OF INSTRUCTION and EXAMINATIONS:
Greek. The course may be offered in English for Erasmus students.

IS THE COURSE OFFERED TO ERASMUS STUDENTS: Yes

COURSE WEBSITE (URL): https://eclass.upatras.gr/courses/CEID1092/

2. LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A
- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

Upon completion of the course, students should be aware of:
- Vectors in the 3D space, the inner product and the external product.
- The cylindrical and spherical coordinates.
- The n-dimensional Euclidean space.
- Vector Functions, Curves and Speed, Arc Length and Vector Fields.
- Gradient, Deviation and Curl of a Vector Field.
- Vector and Differential Calculus.
- The double integral over a rectangle, Double Integrals over General Regions, Changing Order of Integration, the Triple Integrals, change of variables in triple integrals, application...
of the double and triple integrals.

- First-order differential equations (separated variables, linear, homogeneous, precision, Bernoulli and Ricatti). Linear equations of the second order with fixed coefficients, fundamental and general solutions, solving using the Laplace transform.

### General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Decision-making
- Working independently
- Team work
- Working in an international environment
- Working in an interdisciplinary environment
- Production of new research ideas
- Production of free, creative and inductive thinking

### 3. SYLLABUS

- Multivariable Calculus, Limits, Continuity, Partial Derivatives,
- Differential, Extrema, Lagrange Multipliers.
- Double and Triple Integral, Polar, Cylindrical, and Spherical Coordinates.
- Vectors, vector actions, dot and cross product, Vector Functions, Gradient, Deviation and Curl.
- First order differential equations (Separable and exact variables, linear, homogeneous, precision, Bernoulli and Ricatti). Linear equations of the second order with fixed coefficients, fundamental and general solutions, solving using the Laplace transform.

### 4. TEACHING and LEARNING METHODS - EVALUATION

<table>
<thead>
<tr>
<th>DELIVERY</th>
<th>Face-to-Face</th>
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</table>

<table>
<thead>
<tr>
<th>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</th>
<th>The slides and all the auxiliary material are available from the e-Class course website.</th>
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<tr>
<th>TEACHING METHODS</th>
<th><strong>Activity</strong></th>
<th><strong>Semester workload</strong></th>
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<tbody>
<tr>
<td>Lectures</td>
<td>3*13=39</td>
<td></td>
</tr>
<tr>
<td>Tutorials</td>
<td>2*13=26</td>
<td></td>
</tr>
<tr>
<td>Exercises</td>
<td>4*13=52</td>
<td></td>
</tr>
<tr>
<td>Study (not guided)</td>
<td>2*13=26</td>
<td></td>
</tr>
<tr>
<td>Final</td>
<td>3</td>
<td></td>
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| Course Total | 146 |

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<tr>
<th>STUDENT PERFORMANCE EVALUATION</th>
<th>The language of instruction and examination is Greek. Special provisions (lecture notes and examinations in</th>
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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.
Specifically-defined evaluation criteria are given, and if and where they are accessible to students. English) can be made for foreign students.

**Evaluation Methods:**
1) Written final exam (60% of the total score) which includes Theory and Exercises-Problems.
2) Midterm (20% of the total score) which includes Exercises-Problems.
3) Projects (20% of the total score) that include Exercises-Problems and Applications.

**Scale 0-10.**
Passing grade: Greater than or equal to 5.

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5. **ATTACHED BIBLIOGRAPHY**
