COURSE OUTLINE

(1) GENERAL

SCHOOL: Engineering
ACADEMIC UNIT: Department of Computer Engineering and Informatics
LEVEL OF STUDIES: Undergraduate
COURSE CODE: NNY204
SEMESTER: 3rd
COURSE TITLE: Comprehensive Mathematics II

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

<table>
<thead>
<tr>
<th>WEEKLY TEACHING HOURS</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures, Tutorials, Lab Exercises</td>
<td>3 (L), 2 (T), 1 (LE)</td>
</tr>
</tbody>
</table>

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

COURSE TYPE: General background

PREREQUISITE COURSES: None

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/CEID1405/

(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 conclusion of the course the students ought to be able:

To know the meaning of the concepts described in the syllabus and be able to use ideas and technics presented, either to solve relevant problems or even describe some typical phenomena from real life with the aid of these concepts.

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?
Adapting to new situations.
Production of free, creative and inductive thinking.

### (3) SYLLABUS

- Power series, radius of convergence and interval of convergence.
- Limits and continuity of functions of several variables.
- Partial derivatives, the derivative, tangent planes, the gradient and directional derivatives.
- Taylor’s theorem, Lagrange multipliers.
- Polar, Cylindrical, and spherical coordinates.
- Integration in two and three variables, change of the order of integration, change of variables, the Jacobian.
- Vector fields, div and curl.
- Line integrals, surfaces and surface area, surface integrals of scalar functions.
- Simple functions of a complex variable.
- The complex derivative and analytic functions.
- Complex integration, Cauchy’s theorem (simple form), Cauchy’s integral formula.
- 2nd order linear differential equations, particular and general solutions, the solution space.
- Simple systems of differential equations.
- The phase plane.
- Applications and models.
(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<thead>
<tr>
<th>DELIVERY</th>
<th>Face to face.</th>
</tr>
</thead>
<tbody>
<tr>
<td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</td>
<td>The course makes use of the facilities offered by the e-Class environment. All course notes and transparencies are placed online, as well as other additional material.</td>
</tr>
</tbody>
</table>

**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 Semester workload

<table>
<thead>
<tr>
<th>Activity</th>
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</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>3*13=39</td>
</tr>
<tr>
<td>Tutorials (exercise sessions)</td>
<td>2*13=26</td>
</tr>
<tr>
<td>Lab exercises</td>
<td>1*13=13</td>
</tr>
<tr>
<td>Non-guided study</td>
<td>7*13=91</td>
</tr>
<tr>
<td>Preparation for and Final Exam</td>
<td>8</td>
</tr>
</tbody>
</table>

**STUDENT PERFORMANCE**

**EVALUATION**

The language of evaluation is Greek (English in the case of attendance by foreign students).

**Method of evaluation**: The final grade is based either 100% on performance on the final written Examination, or on a final exam on part of the material taught plus a midterm test. The exact method of evaluation is shown from the beginning of the semester in the eclass page of the course.

**Grading scale 0-10.**

Passing grade greater than or equal to 5.

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

**(in Greek)**

- Δ. Γεωργίου, Θ. Καρακασίδης, Α. Μεγαρίτης, Διαφορικός & Ολοκληρωτικός Λογισμός Συναρτήσεων Πολλών Μεταβλητών, Εκδόσεις Τζιόλα, 2022.

*(in English)*


*Related academic journals:*