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*	**WEEKLY TEACHING HOURS**	**ECTS**
Lectures, Tutorials, Lab Exercises	3 (L), 2 (T), 1 (LE)	7
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	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?

Search for, analysis and synthesis of data and information, with the use of the necessary technology *Adapting to new situations* *Decision-making* *Working independently* *Team work* *Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas*	*Project planning and management* *Respect for difference and multiculturalism* *Respect for the natural environment* *Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking* *……* *Others…* *…….*

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.
- 2^{nd} 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>
<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>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>
<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, 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</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<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>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>177</td></tr>
</table>
</td></tr>
<tr><td>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

Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</td><td>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.</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

(in Greek)

- I. S. Sokolnikoff, R. M. Redheffer, *Μαθηματικά για Φυσικούς και Μηχανικούς*, (μετάφραση) Πανεπιστημιακές Εκδόσεις ΕΜΠ 2001.
- J. Rogawski, C. Adams, R. Franzosa, *Ανάλυση*, Β' τόμος, (μετάφραση), Gutenberg, 2023.
- J. Marsden, A. Tromba, Διανυσματικός λογισμός, Πανεπιστημιακές Εκδόσεις Κρήτης, 2020.
- Δ. Γεωργίου, Θ. Καρακασίδης, Α. Μεγαρίτης, *Διαφορικός & Ολοκληρωτικός Λογισμός Συναρτήσεων Πολλών Μεταβλητών,* Εκδόσεις Τζιόλα, 2022.
- R. L. Finney, M. D. Weir, F. R. Giordano, *Thomas Απειροστικός Λογισμός* (σε ένα τόμο) (μετάφραση της 10ης Έκδοσης), Πανεπιστημιακές Εκδόσεις Κρήτης, 2015.

- W. Briggs, L. Cochran, B. Gillett, *Απειροστικός Λογισμός*, Κριτική, 2018.

(in English)

- I. S. Sokolnikoff, R. M. Redheffer, Mathematics of Physics and modern Engineering, 2nd Edition, McGraw-Hill, New York, 1966.
- R.L. Finney, M.D. Weir, F.R. Giordano, Thomas' Calculus, 10th edition, Addison-Wesley, 2003.
- J. Rogawski, C. Adams, R. Franzosa, Calculus, 4th edition, Macmillan, 2019.
- W. Briggs, L. Cochran, B. Gillett, Calculus, 2nd edition, Pearson, 2015
- M. Spivak, Calculus, 4th edition, Publish or Perish, 2008.

Related academic journals: