COURSE OUTLINE

(1) GENERAL

SCHOOL	Social Sciences		
ACADEMIC UNIT	Cultural Technology and Communication		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**MATH100**	**SEMESTER**	1
COURSE TITLE	MATHEMATICAL ANALYSIS		

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**	**CREDITS**
Lectures	3	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).	3	6

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Core Course/General Background
PREREQUISITE COURSES:	None
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://eclass.aegean.gr/courses/131419/

(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*

The students will be in the position to understand mathematical tools, which will help them to:

- Comprehend the algorithmic methods used in computer science.
- Understand easily and fast the computer programming methodology.
- Better understand data analytics, which include cultural data analytics, also.
- Build a solid background of mathematics, which will assist them regarding the cultural informatics courses as well as in their future carrier.

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
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
……

Production of new research ideas	*Others…* *…….*

• 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
• Project planning and management
• Production of free, creative and inductive thinking
• Working in an interdisciplinary environment

(3) SYLLABUS

The course focuses on several mathematical tools, which constitute the very core of innovative technologies used in Cultural Informatics, such as: Relations-functions, Boolean algebra, geometry, linear algebra and matrices, derivative-integral, and statistics.

Structure of the course

1. Set theory and Boolean algebra
2. Functions
3. Trigonometry and geometry
4. Geometry for 3D graphics
5. Sequences-limits
6. Continuity
7. Derivative and integration
8. Multivariable functions and partial derivatives
9. Linear algebra I
10. Linear algebra II
11. Probabilities
12. Descriptive statistics-estimation statistics-confidence intervals
13. Least squares-regression

(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></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>13 *3 hours =39hours</td></tr>
<tr><td>Lectures’ study</td><td>13*6 hours = 78 hours</td></tr>
<tr><td>Laboratory Practice</td><td></td></tr>
<tr><td>Laboratory Preparation and semester assignment</td><td></td></tr>
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<tr><td>Course total</td><td>117 hours</td></tr>
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<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 final examination is the main tool to evaluate student’s performance. In this exam the student gets involved in solving complex programming problems.

During semester, each student is also invited to carry out optional homework tests. If the student accepts the invitation, these tests will be positively considered in student’s final evaluation.

The evaluation criteria are clearly announced during the first lecture and in the e-class web site.</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Χαλιδιάς Ν., Στοιχεία Εφαρμοσμένων Μαθηματικών, Εκδόσεις Νέων Τεχνολογιών, Au;hna, 2016
- Χαλιδιάς Ν., Εφαρμοσμένα Μαθηματικά για Οικονομολόγους και Μηχανικούς, BROKEN HILL PUBLISHERS LTD, Λευκωσία, Κύπρος, 2021
- Finney R.L., Weir M.D., Giordano F.R., Απειροστικός Λογισμός, (επιμέλεια μετάφρασης Αντωνογιαννάκης Μ.) Πανεπιστημιακές Εκδόσεις Κρήτης, Ηράκλειο, 2006.
- Γιαννόπουλος Α., Εισαγωγή στην Ανάλυση Ι, Πανεπιστήμιο Κρήτης-Τμήμα Μαθηματικών, 2001.
- Ξένος Θ., Μαθηματική Ανάλυση, Εκδόσεις Ζήτη, 2006.
- Σακαλής Π., Απειροστικός Λογισμός και Πραγματική Άλγεβρα, Εκδόσεις, Δάρδανος, 2005.
- Brannan D.A., A First Course in Mathematical Analysis, Cambridge University Press, 2006.