COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Agricultural Sciences		
ACADEMIC UNIT	Biosystems & Agricultural Engineering		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**BAE_210**	**SEMESTER**	**2nd**
COURSE TITLE	**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**	**CREDITS**
Lectures	3	
Tutorials	2	
Laboratory	0	
TOTAL	**5**	**5**
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*	Background
PREREQUISITE COURSES:	There are no prerequisite courses. There are no prerequisite courses. However, students must have a good knowledge of the differential and integral calculus and functions of a variable.
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek .-For Erasmus students in English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes. Project work
COURSE WEBSITE (URL)	

(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 material of the course Mathematics II is a tool for students of the Department of Biosystems Science and Agricultural Engineering which aims to introduce and familiarize them with the concepts and methodologies of applied mathematics for engineers who are a tool in their science and especially in the regions. of the differential-integral calculus of functions of many variables and vector analysis. This knowledge is necessary and will be used in many subsequent lessons.

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
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

Working in an interdisciplinary environment *Production of new research ideas*	*……* *Others…* *…….*
At the end of the course the student will have acquired the ability to use the mathematical methods effectively in the next courses in his / her studies at EVGM as well as in related problems of EVGM. Additional goal is to be able to:1. Autonomous Work 2. Teamwork 3. Decision Making 4. Critical analytical and synthetic thinking for solving mathematical problems in Agricultural Engineering	

(3) SYLLABUS

Differential Calculus of Multivariate Functions, Vector Analysis and Integral Calculus of Multivariate Functions:

1. Functions of many variables (Cartesian, cylindrical and spherical coordinates in space. Second degree surfaces)
2. Some 1st and higher order derivatives (physical importance, production rules)
3. Double integrals.
4. Triple integrals.
5. Curved integrals.
6. Vector functions.
7. Sequences. Rows and dynamos.
8. Ordinary differential equations. Ordinary first order differential equations: Separate variables
9. Ordinary first order differential equations: Bernulli equation, linear equations.
10. Linear ordinary higher order differential equations with constant coefficients.
11. Linear ordinary higher order differential equations with constant coefficients.
12. Systems of differential equations.
13. Initial and limit value problems.

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Teaching in the amphitheater: Lectures using electronic media which relate to the theory, exercises and applications in the area of Biosystems and Agricultural Engineering.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>• Use of ICT (power point) in Teaching
• Use of ICT (power point) in Laboratory Training
• Use of ICT in Communication with students (Learning process support through the electronic platform e-class).</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>39</td></tr>
<tr><td>Tutorials</td><td>26</td></tr>
<tr><td>Unguided study</td><td>57</td></tr>
<tr><td>Final Exams</td><td>3</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>125</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-</td><td>Written or oral final exam with physical presence or online with or without contribution of project work during the semester
The evaluation is dynamic. It mainly involves problem solving. is done orally or in writing or with a combination of</td></tr>
</table>

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.*	the two, with or without pre-examination on the basic principles of the course, with or without exculpatory advances and with other test or inventive methods, depending on the composition of the dynamics and the needs of the audience. 4. The above are done in the Greek language. For foreign language students (eg Erasmus students) conducted in English

(5) ATTACHED BIBLIOGRAPHY (IN GREEK)

- BrandL., «Μαθηματική Ανάλυση», Εκδόσεις Ελληνικής Μαθηματικής Εταιρίας, Αθήνα, 1984
- FinneyR.L., WeirM.D. GiordanoF.R, «Απειροστικός Λογισμός», Πανεπιστημιακές Εκδόσεις Κρήτης, Ηράκλειο, 2009
- Αθανασιάδης Α.Γ., «Διαφορικός και ολοκληρωτικός λογισμός συναρτήσεων μιας μεταβλητής και Εισαγωγή στην αναλυτική γεωμετρία», Εκδόσεις Τζιόλα, Θεσσαλονίκη, 2001
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- Βλάχος Λ., «Διαφορικός λογισμός πολλών μεταβλητών», Εκδόσεις Τζιόλα, Θεσσαλονίκη, 2008
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- Καρανικόλας Ν.Δ., «Εισαγωγή στο διαφορικό λογισμό συναρτήσεων πολλών μεταβλητών», Εκδόσεις Ζήτη, Θεσσαλονίκη, 2004
- Smith R.T, Minton R.B., «Calculus», McGraw-Hill, 2000
- ThomasG.B., FinneyR.L., «Απειροστικός λογισμός», Πανεπιστημιακές Εκδόσεις Κρήτης, Ηράκλειο, 1999
- Τσιάνος Β., «Ανώτερα μαθηματικά για μηχανικούς», Εκδόσεις Τζιόλα, Θεσσαλονίκη, 2005