COURSE OUTLINE

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	FOOD SCIENCE AND TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	FST_100	**SEMESTER OF STUDIES**	1st
COURSE TITLE	MATHEMATICS		

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 CREDITS**
Lectures, seminars	4	
Exercises	1	
Total	**4**	**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*	Compulsory General background
PREREQUISITE COURSES:	There are no prerequisite courses
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBPAGE (URL)	https://eclass.upatras.gr/

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*

Main target of this course is the training of students on handling problems using Mathematical tools like integrals, derivatives, differential equations, matrixes etc.

More specific, the lessons which are offered are from the following topics:

- Vectors, Matrixes, Determinants
- Linear equation systems, Function limits
- Derivatives, Integrals
- Multivariable functions, Partial derivatives
- Cost functions, Sale functions, Demand functions
- Limited quantities, quantities variation rates
- Local extremum of quantities as a time function

- 1st order linear differential equations, 2nd order linear differential equations

By the end of this course the student will be able to:

- Integrate functions and to interpret the results
- To determine the price and the price extremum of a product as a time function depending on market conditions
- Exploit the capabilities that mathematical tools offer for the prediction and handling of products market
- know in-depth the basic theoretical knowledge about the subject
- use knowledge and understanding acquired in a manner that indicates a professional approach to their work or profession
- have competences typically demonstrated by developing and supporting arguments and solving problems within their field of knowledge
- communicate information, ideas, problems and solutions to both specialist and non-specialist public
- develop knowledge acquisition skills needed to continue to post graduate studies with a high degree of autonomy
- gather and interpret relevant data (in their knowledge field) to form judgments that include reflection on relevant scientific issues

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	*Search for, analysis and synthesis of data and information, with the use of the necessary technology*
Adapting to new situations	*Adapting to new situations*
Decision-making	*Decision-making*
Working independently	*Working independently*
Team work	*Team work*
Working in an international environment	*Working in an international environment*
Working in an interdisciplinary environment	*Working in an interdisciplinary environment*
Production of new research ideas	*Production of new research ideas*

By the end of this course the student will, furthermore, have developed the following skills (general abilities):

- Searching, analysis and synthesis of facts and information, as well as using the necessary technologies
- Adaptation to new situations
- Decision making
- Autonomous (Independent) work
- Promotion of free, creative and inductive thinking

3. SYLLABUS

1. Functions (linear, non-linear, exponential, logarithmic). Solution metghods application on practical problems.
2. Differentiation theory (numerical sequences, limits, function continuation, derivatives application, univariable function optimization, function optimization)
3. Differentiation theory application for problems solution, Overall and limited quantities, flexibility. Production, cost, income, profit usefulness functions. Functions optimization, dead points.
4. Integration theory (integrals, integration methods, applications of integrals)
5. Linear algebra (linear equation systems, vectors, matrixes, determinants
6. Multivariable functions (multivariable function derivation, partial derivatives application, multivariable function optimization). Complex function derivation.
7. Differential equations. Solution and application of 1st and 2nd order differential equations

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>Use of Information and Communication Technologies (ICTs) (e.g. powerpoint) in teaching.
Communication with students: through e-mail, department’s website and platform e-class.
The lectures content of the course for each chapter are uploaded on the internet, in the form of a series of .pdf files, where students can freely download them from the platform e-class.upatras.gr</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>Activities</th><th>Work Load per semester</th></tr>
<tr><td>Lectures (3 conduct hours per week x 13 weeks)</td><td>39</td></tr>
<tr><td>Seminars (1 conduct hour per week x 13 weeks)</td><td>13</td></tr>
<tr><td>Final examination (3 conduct hours)</td><td>3</td></tr>
<tr><td>Non-guided study</td><td>70</td></tr>
<tr><td>Total number of hours for the Course (25 hours of work-load per ECTS credit)</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-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>Written examination after the end of the semester (100%) including:
• Solving practical problems using mathematical tools
• Benchmarking theory elements

Grading scale: 1 to 10.
Minimum passing grade: 5.
Examination time: 3 hours.</td></tr>
</table>

5. ATTACHED BIBLIOGRAPHY

1. Mathematics for engineers and scientists, Chantzikonstatinou P., 1st Edition, 2018, Publisher: Gotsis Ltd (in Greek).
2. Mathematics I, Petrakis L.A., Petraki A.D., Petrakis A.L, 2nd Edition, 2017, Publisher: Petraki Dorothea. (in Greek).
3. Applied Mathematics, Chatzarakis G. – Milonas N., 2nd Edition, 2018, Publisher: A. Tziola & Sons Ltd (in Greek).
4. Essential Mathematics for Economics and Business, Bradley Teresa, Paperback: 682 pages, Publisher: John Wiley & Sons; 3rd Revised edition edition (27 May 2008), Language: English, ISBN-10: 0470018569.