ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ

Α .Δ Ι .Π .

ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ & ΠΙΣΤΟΠΟΙΗΣΗΣ

ΤΗΣ ΠΟΙΟΤΗΤΑΣ ΣΤΗΝ ΑΝΩΤΑΤΗ ΕΚΠΑΙΔΕΥΣΗ

HELLENIC REPUBLIC

Η .Q .Α .

HELLENIC QUALITY ASSURANCE

AND ACCREDITATION AGENCY

ΤΕΧΝΟΛΟΓΙΚΟ ΕΚΠΑΙΔΕΥΤΙΚΟ ΙΔΡΥΜΑ ΑΝΑΤΟΛΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ ΚΑΙ ΘΡΑΚΗΣ

ΜΟΝΑΔΑ ΔΙΑΣΦΑΛΙΣΗΣ ΤΗΣ ΠΟΙΟΤΗΤΑΣ ΤΕΙ ΑΜΘ

Quality Assurance in Higher Education

Course Data Collection Form

ΤΕΧΝΟΛΟΓΙΚΟ ΕΚΠΑΙΔΕΥΤΙΚΟ ΙΔΡΥΜΑ

ΑΝΑΤΟΛΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ & ΘΡΑΚΗΣ

ΑΓΙΟΣ ΛΟΥΚΑΣ,

65404 ΚΑΒΑΛΑ

EASTERN MACEDONIA AND THRACE INSTITUTE OF TECHNOLOGY

AGIOS LOUKAS

65404 KAVALA

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF TECHNOLOGICAL ENGINEERING		
ACADEMIC UNIT	ELECTRICAL ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	GN1	**SEMESTER**	**3ο**
COURSE TITLE	MATHEMATICS III		

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	5	8
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,* *Specialised general knowledge,*
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK / ENGLISH
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	http://engmath.teiemt.gr/moodle/

(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*

With the successful completion of the course the students have to be able:

- To calculate the limits, the continuity, and the partial derivatives of a function of

several variables. Moreover, to calculate the critical points, the minimum and maximum points for functions of several variables.
- To calculate double, triple and line integrals.
- To calculate directional cosines. To calculate the limits, the continuity, the derivatives and the integrals of vector functions. To find the gradient, divergence and the curl of vector functions.
- To calculate Laplace transform of basic functions. To solve differential equations of first and second order with the Laplace transform. To solve systems of differential equations with the Laplace transform.
- To calculate Fourier transform of basic functions.

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

- Retrieve, analyze and synthesize data and information, with the use of necessary technologies
- Adapt to new situations and make decisions
- Work autonomously, but also work in teams
- Be critical and self-critical
- Advance free, creative and causative thinking

(3) SYLLABUS

1. Introduction to Multiple Variable Calculus
   1.1. Definitions, limits, continuity, partial derivatives.
   1.2. Critical points. Minimum and maximum. Applications.
2. Double/Triple/Line Integrals/Applications
3. Vector Analysis
   3.1 Definitions, directional cosines, Cartesian coordinates, dot product, cross product. Triple product.
   3.2 Limits, continuity, differentiation, integration of vector functions.
   3.3 Gradient, divergence, curl. Applications.
4. Laplace transform
   4.1 Basic Laplace transforms.
   4.2 Solution of differential equations with Laplace transforms.
   4.3 Solution of systems of differential equations with Laplace transforms.
5. Fourier transform

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In classroom, distance learning via the asynchronous platform
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Presentations using Power Point transparencies. Use of Matlab software, use of other appropriate software (Microsft

<table>
<tr><td>Use of ICT in teaching, laboratory education, communication with students</td><td>Matematics 4.0, etc.), material in the e-class platform (videos, exercices, quizes, etc.) use of whiteboard.
Contact with the students electronically (via e-mail, a group in facebook, via Skype).</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>52</td></tr>
<tr><td>Online lectures</td><td>13</td></tr>
<tr><td>Exercises</td><td>13</td></tr>
<tr><td>Hours of personal study/exams</td><td>122</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total (30 hours / ECTS)</td><td>200</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>- Final exam (50%) which includes:
• Solution of problems with quantitative data

- Two group assignments (40%)

- Attendance of lectures / Regular visit to e-class / facebook group (10%)</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Related academic journals:

1. Μυλωνάς Νίκος, «Διαφορικός και Ολοκληρωτικός Λογισμός Συναρτήσεων Πολλών Μεταβλητών», εκδ. Τζιόλα, Θεσσαλονίκη, 2010.
2. Μυλωνάς Νίκος, Σχοινάς Χρήστος, "Διαφορικές Εξισώσεις, Μετασχηματισμοί και Μιγαδικές Συναρτήσεις", εκδ. Τζιόλα, Θεσσαλονίκη, 2015.
3. Β. Τσιάντος, "Μαθηματικά για Μηχανικούς", εκδ. ΤΖΙΟΛΑ, Θεσσαλονίκη, 2015.
4. Ayres F. JR, “Calculus (Theorems and Problems)”, Shaum’s Outline Series, 1999.
5. Budak B.M, Fomin S.V., “Multiple Integrals, Field Theory, Series”, MIR Publishers, 1978.
6. Croft A., Hargreaves M., Davison P., «Engineering Mathematics, A Foundation for Electronic, Electrical, Communications and Systems Engineers», 3rd Edition, Prentice Hall, 2000.
7. Spiegel M. R., “Advanced Calculus”, Shaum’s Outline Series.
8. Stroud K.A., Booth D. J., “Engineering Mathematics, sixth edition, Palgrave McMillan, 2007.
9. Ayres F. JR, Mendelson E., "Διαφορικός και Ολοκληρωτικός Λογισμός", τέταρτη αμερικανική έκδοση, Κλειδάριθμος, Αθήνα, 2007.