## COURSE MODULE OUTLINE

### General information

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| **SCHOOL** | SCHOOL OF SCIENCE AND TECHNOLOGY | | |
| **PROGRAM COURSE** | QUALITY MANAGEMENT AND TECHNOLOGY | | |
| **LEVEL OF STUDY** | POSTGRADUATE-INTRODUCTORY | | |
| **COURSE UNIT CODE** | DIP-40 | **YEAR OF STUDY** | 1st |
| **COURSE TITLE** | Quality Management and Engineering | | |
| **INDEPENDENT TEACHING ACTIVITIES** *in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits* | | **WEEKLY TEACHNG HOURS** | **CREDITS** |
| Weekly teaching hours (16) * 18 weeks = 290 | | 13 | |
| *Add rows if necessary. The organization of teaching and the teaching methods used are described in detail under section 4* | | | |
| **COURSE TYPE** Compulsory, Optional, Optional mandatory | Introductory (required for university graduates, who have NOT taken four (4) semester courses of mathematics). | | |
| **PREREQUISITE COURSES:** | There are not prerequisite courses | | |
| **LANGUAGE OF INSTRUCTION AND EXAMS:** | Greek | | |
| **THE COURSE IS OFFERED TO ERASMUS STUDENTS** | No (due to annual duration of the module) | | |
| **COURSE WEBSITE (URL)** | https://www.eap.gr/education/postgraduate/annual/quality-management-and-technology/topics/#d40 Each module has its own space in the Learning Management System of EAP (http://study.eap.gr), with controlled access (use of code) for students and teaching staff. | | |

## 1. LEARNING OUTCOMES

***Learning Outcomes***

● *The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:*

After completing this module, students are expected to be able to:

- basic knowledge of differential and integral calculus of one and two variables and can use this knowledge to find optimal solutions (maximum or minimum) of physical problems
- basic knowledge of ODEs
- basic knowledge of vector algebra (scalar and vector product) and can mathematically project vectors of physical quantities in specific directions and determine perpendicular directions to a given plane
- basic knowledge of linear algebra (matrix algebra) and solving linear systems that are the result of many physical problems
- has all the necessary mathematical background to follow without problems DIP 50 (basic methodology of statistics and basic techniques for quality control, assurance and improvement).

**General Competences**

*Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?*

*Search for, analysis and synthesis of data and information by the use of appropriate technologies,*
*Adapting to new situations*
*Decision-making*
*Individual/Independent work*
*Group/Team work*
*Working in an international environment*
*Working in an interdisciplinary environment*
*Introduction of innovative research*
*Project planning and management*
*Respect for diversity and multiculturalism*
*Environmental awareness*
*Social, professional and ethical responsibility and sensitivity to gender issues*
*Critical thinking*
*Development of free, creative and inductive thinking*
*……*
*(Other…….citizenship, spiritual freedom, social awareness, altruism etc.) …….*

*Adapting to new situations*
*Decision-making*
*Group/Team work*
*Working in an interdisciplinary environment*
*Environmental awareness*
*Critical thinking*

## 2. MODULE CONTENT

The main objective of the module is the completion of the student's knowledge in the field of Maths, to prepare them for the first year of his/her studies, and allow him/her to more easily follow the remaining modules of the "Quality Management and Engineering" Study Program.

The key subjects of the module are:

Functions of one variable, limits, continuity, derivatives, study of functions with derivatives, integrals, Indefinite Integrals, definite integrals, numerical integration.

Generalized integrals. 1st order ordinary differential equations (basic forms).

Functions of several (two) variables, limits, partial derivative, extrema of functions of several variables, multiple integrals, change of variables, Jacobian.

Vectors, vector algebra, scalar, vector and mixed product.

• Matrices, Matrix operations, adjoint and inverse Matrix.

• Solving systems of linear equations, existence of a solution, indefinite and impossible systems

## 3. TEACHING METHODS--ASSESSMENT

<table>
<tr><td>MODES OF DELIVERY<br>Face-to-face, in-class lecturing, distance teaching and distance learning etc.</td><td>Distance education with four (4) Group Counseling Meetings (OSS) during the academic year on weekends.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY<br>Use of ICT in teaching, Laboratory Education, Communication with students</td><td>We use :<br>Remote meetings tools (cisco webex),<br>Presentation software (e.g. power point),<br>Specialized software in the subjects under study<br><br>Additionally, the students use office automation tools, web browsers and e-reader for digital books.</td></tr>
<tr><td>MODULE DESIGN<br>Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography,</td><td><table><tr><th>Activity</th><th>Annual Workload</th></tr><tr><td>4 OSS (* 4 hours)</td><td>16</td></tr></table></td></tr>
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| *tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc*<br><br>*The study hours for each learning activity as well as the hours of selfdirected study are given following the principles of the ECTS.* | <table><tr><td>Preparation of Assignments (4 assignments * 10 hours)</td><td>40</td></tr><tr><td>Examination</td><td>3</td></tr><tr><td>Individual study</td><td>230</td></tr><tr><td>**Total module workload (hours)**</td><td>**290**</td></tr></table> |
| **STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS**<br>*Detailed description of the evaluation procedures.*<br><br>*Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work, other……etc.*<br><br>*Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students* | Elaboration of written assignments during the academic year, the average of the grades of which participates in the formation of the final grade of module by 30%, if there is a passable in the final or repetitive examinations. In the final written exams the grade of the written assignments participates in the formation of the final grade of module by 70%.<br><br>All the criteria are posted, both in each written assignment (in the LMS study.eap.gr), as well as in the general regulation of HOU at: https://www.eap.gr/education/study-regulations/ |

## (6) SUGGESTED BIBLIOGRAPHY

- *Suggested bibliography:*

HOU Publications:
Volume A: K. Georgiou, Mathematics for Quality Assurance, EAP, Patras, 2001.
TEXT PACKAGES THAT ARE PHOTOPRINTED AND GIVEN TO STUDENTS (PARALLEL TEXTS, ACCOMPANYING TEXTS, etc.)
Accompanying texts (Offer in photocopy):
1. Examples and exercises of calculus and linear algebra for quality assurance (K. Georgiou)
2. Parallel texts for the volume: Mathematics for Quality Assurance (M. Hatzinikolaou)
3. Examples and Exercises of Set Theory (F. Stavropoulos).
4. From the volume FYE14/1, Chapter 2 "Vectors", pp. 30-83 (M. Hatzinikolaou)

Additional Indicative Bibliography

1. G. Dasios, Calculus of one variable, General Mathematics Volume II, (Studies in Natural Sciences)
2. G. Dasios, Calculus of Many Variables, General Mathematics I, Volume II, (Studies in the Natural Sciences)