COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	FINANCIAL AND MANAGEMENT ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	OI0111	SEMESTER	8
COURSE TITLE	COST BENEFIT ANALYSIS & INVESTMENT DECISIONS		

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
	3	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*	Track Compulsory (Tr. II) and Track Elective (Tr. I)
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	http://www.fme.aegean.gr/en/undergraduate-programme

(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*

Module Objective

Upon successful completion of the course the student should be confident about the following:

Understanding of basic concepts necessary for elaborating feasibility studies (cash-flow diagram representations, investment horizon, viewpoint of analysis, opportunity cost of capital, taxation, depreciation, inflation)

Emphasis on the proper use of the four investment criteria for comparing mutual alternatives, under the unified methodological framework of incremental analysis

Application of the above in solving real-world problems and case studies / analysis of the perspective of an engineering career in the field of consulting

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…*
	…….

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

(3) SYLLABUS

Description:

An introductory course on the principles of engineering economy in which the basic concepts regarding benefit and cost in both monetary and non-monetary terms are discussed. Students are exposed to managing actual problems, public projects, socio-economic studies, and major private investment decisions.

Topic areas include:

o Basic Concepts (Economic Life, Cash-Flow Diagrams, Viewpoint, Mutual Alternatives)
o Interest formulas - Equivalence
o Present Worth, Annual Worth, Incremental Analysis in Investment Decisions
o Bond Evaluation using Present Worth, Benefit-Cost Ratio, Rule of Delta
o Internal Rate of Return, Descartes' Rule, Nostrom's Condition, Bergman's Rule
o Depreciation, Taxation and Inflation in cost-benefit analysis
o Multiple alternatives, Sensitivity Analysis, Capital budgeting

o Socio-economic Studies, International Projects

Module Contents (Syllabus):

1.Basic Concepts (Cost of Capital, Viewpoint, Types of Investment Decisions, Cash-Flow Diagrams)

2. Equivalence – Interest and Mathematics of Finance - Compound Interest Factor Tables (P/A, P/F, A/F, F/P, A/P, F/A, P/G, A/G)

3. Compound Interest , Interest and Principal Separation, Nominal and Effective Rate of Interest, Continuous Compounding

4. Present Worth, Annual Worth, Incremental Analysis

5. Unequal investment horizons and Present Worth, Infinite Investment Horizon, Present Worth and Bond Valuation)

6. 1st Written Test

7. Benefit-Cost Ratio (B/C) Internal Rate of Return (IRR)

8. B/C and Rule of Delta, IRR and Nostrom Condition, ,Descartes' Rule of Signs, Bergmann's Rule, Incremental Analysis in B/C and IRR)

9. 2nd Written Test

10. Depreciation and Taxation in Cost-Benefit Studies

11. Inflation - Sensitivity Analysis – Loans

12. Multiple Alternatives – Cost of Capital – Capital Budgeting – Big Projects – Public Projects

13. Non-economic Costs and Benefits - Socio-economic Studies / Feasibility Studies - Consulting Career in Engineering Economy Topics

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td></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>Scheduled Lectures</td><td>39 hrs</td></tr>
<tr><td>Partial (mid-semester) exams</td><td>46 hrs</td></tr>
<tr><td>Project elaboration (written text and oral presentation)</td><td>25 hrs</td></tr>
<tr><td>Preparation for the final exam</td><td>40 hrs</td></tr>
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<tr><td>Course total</td><td>150 hrs</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>Final exam on course notes for 100% of the final mark of the student.

Two mid-semester exams offer up to 20% bonus in the final mark. A project with written and oral part offers up to 10% additional bonus to the final mark of the student.</td></tr>
</table>

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

A) Course Textbook:

1. Dounias G. And Moustakis V.S. (2008 – 2nd Edition), Engineering Economy (textbook), Pyxida Publications, Chios, (in Greek), ISBN: 978-960-86696-2-8

B) Additional Reading:

1. 2. Eugene Lodewick Grant, William Grant Ireson, Richard S. Leavenworth, (1982), Principles of engineering economy, 5th Ed., Wiley, USA

3. Henry Malcolm Steiner (1996), Engineering Economic Principles, McGraw Hill, USA