

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
ACADEMIC UNIT	Financial and Management Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ΓΕΟ144	SEMESTER	8
COURSE TITLE	SYSTEM RELIABILITY		
INDEPENDENT TEACHING ACTIVITIES <i>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</i>		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	general background, special background, specialised general knowledge, skills development		
PREREQUISITE COURSES:	No		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
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 objective of this course is to provide students with the appropriate knowledge in order to conduct a reliability study and more specifically, it aims to make known the advantages of these kinds of studies to engineers and their use in the decision-making process for the strengthening of the systems. After the successful completion of the course, the student will have:

to know the basic concepts of reliability engineering modelling.

to know the basic concepts of reliability, availability and maintainability.

to be in position to apply all these concepts in different application areas

to identify complex systems and compute complex failure/operation probabilities

to understanding scientific papers, in related areas.

to improve teamwork skills

to perform a critical and analytical study of scientific papers.

to synthesis information from different but related scientific papers

to make a synthetic presentation of scientific papers and improvement proposals.

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

Working in an interdisciplinary environment

Production of new research ideas

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

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Others...

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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

Working in an interdisciplinary environment

Production of new research ideas

Critical thinking

Production of free, creative and inductive thinking

(3) SYLLABUS

Basic principles of system reliability. Reliability modelling with reliability block diagrams. Reliability modelling with fault-trees. Computational techniques for the reliability evaluation of complex technological systems. Reliability evaluation with the use of Markov models. Reliability evaluation of electrical systems. Reliability evaluation of electronic systems. Reliability evaluation of mechanical systems. Reliability evaluation of information systems.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of ICT in teaching, and specific software	
TEACHING METHODS <i>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.</i> <i>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</i>	Activity	Semester workload
	Lectures	39
	study and analysis of bibliography	30
	project	60
	Mini dissertation writing	18
	exams	3
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>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</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	Course total 150	
	- Projects (selection of a scientific paper in Reliability Engineering and in an application area proposed by the student, analysis and presentation) by group of 2 or 3 students. - Assessment grade is based on the final report and its presentation.	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Διαλυνάς, E.N., «Ανάλυση Αξιοπιστίας Τεχνολογικών Συστημάτων», Εκδόσεις Συμεών, Αθήνα (in Greek)

Billinton, R., Allan, R.N., «Reliability Evaluation of Engineering Systems», Pitman Books Ltd, London, 1983

Ionescu, D.C., Limnios, N., «Statistical and Probabilistic Models in Reliability», Birkhauser, Boston, 1999

Pagès A., Gondran M., «Fiabilité des Systèmes», Collection de la Direction des Etudes et Recherche d'Electricité de France, Paris, 1980 (in French)

Trivedi K, S, (2002) Probability and Statistics with Reliability, Queuing and Computer Science Applications. John Wiley and Sons, New York

- Related academic journals:

Reliability Engineering and System Safety, IEEE transactions on reliability.