

1.1.1 Engineering Seismology and Earthquake Engineering

GENERAL

SCHOOL	Engineering		
ACADEMIC UNIT	CIVIL ENGINEERING		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	FEQ005	SEMESTER	7th
COURSE TITLE	Engineering Seismology and Earthquake Engineering		
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	
	4	5	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialization Course		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)			

LEARNING OUTCOMES

<p>Learning outcomes</p> <p><i>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.</i></p> <p>Consult Appendix A</p> <ul style="list-style-type: none"> • 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 		
<p>Upon completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> • be familiar with the basic rules of technical seismology, rupture processes of seismically active faults and the propagation of seismic ground motion • be familiar with the basic provisions of Eurocode 8 that are related to the seismic design philosophy • assess the expected seismic hazard in an area. • make a basic analysis and interpretation of the seismic signal 		
<p>General Competences</p> <p><i>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?</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i> <i>Adapting to new situations</i> <i>Decision-making</i> <i>Working independently</i> <i>Team work</i> </td> <td style="width: 50%; border: none;"> <i>Project planning and management</i> <i>Respect for difference and multiculturalism</i> <i>Respect for the natural environment</i> <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i> <i>Criticism and self-criticism</i> </td> </tr> </table>	<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i> <i>Adapting to new situations</i> <i>Decision-making</i> <i>Working independently</i> <i>Team work</i>	<i>Project planning and management</i> <i>Respect for difference and multiculturalism</i> <i>Respect for the natural environment</i> <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i> <i>Criticism and self-criticism</i>
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<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment</i>
<i>Production of new research ideas</i>	<i>Others...</i>

- Decision making
- Design and management of assignments
- student individual project
- Search, analysis and synthesis of information and data using the appropriate technology

SYLLABUS

<ul style="list-style-type: none"> • Technical seismology, seismicity, ground motion prediction equations. Seismic risk and seismic hazard. • Ground motion. Characteristics, forms, dependent factors. Duration of seismic motion and influential factors. • Near-field earthquakes. Effect of vertical component. • Prediction of seismic motion. Seismic codes. Probabilistic analysis of seismic hazard. Seismic scenarios. Response spectra. • Influence of site effects on the seismic response, soil liquefaction.
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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>		
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	52
	Individual study	78
	Course total (26 hours workload per ECTS credit)	130
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>	<ol style="list-style-type: none"> 1. Individual project aiming at better understanding the teaching concepts 2. Final written exam at the end of the semester (in Greek language) 	

ATTACHED BIBLIOGRAPHY

- [in Greek] Πιπυλάκης Κυριαζής: «Γεωτεχνική σεισμική μηχανική» Έκδοση: 1η έκδ./2010, ISBN: 978-960-

456-226-8, Εκδότης: Ζήτη Πελαγία Σια Ι.Κ.Ε.

- [in Greek] Καρακαΐσης Γεώργιος, Παπαζάχος Βασίλης, Χατζηδημητρίου Παναγιώτης, «Εισαγωγή στη Σεισμολογία», Εκδόσεις Ζήτη, 2005, ISBN: 960-431-979-5
- Sucuoğlu, Halûk, Akkar, Sinan: “Basic Earthquake Engineering”, Springer, 2014, ISBN-10 : 3319010255
- Roberto Villaverde, “Fundamental Concepts of Earthquake Engineering”, CRC Press, 2009, ISBN-10 : 1420064959