COURSE OUTLINE

(1) GENERAL

SCHOOL	**UNIVERSITY OF THESSALY**		
ACADEMIC UNIT	DEPARTMENT OF CIVIL ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**ΔΟ2903**	**SEMESTER**	8 th
COURSE TITLE	REINFORCED CONCRETE 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**
	4	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, specialized general knowledge, skills development*	*specialized general knowledge*
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek.
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/CULT_U_235/

(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 course aims to provide an understanding and interpretation of seismic actions on the behavior of reinforced concrete structures. It focuses on the assessment and prediction of the behavior of reinforced concrete structural elements based on different types of loading.

Knowledge

Upon completing the course, students will acquire advanced knowledge, enabling them to critically understand theories and principles related to:

- The behavior of reinforced concrete structural elements subjected to seismic loading.
- The analysis and design of reinforced concrete structures under seismic forces.
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Skills

Upon completion of the course, students will have developed advanced skills in processing, analyzing, and solving complex problems related to the analysis and design of reinforced concrete structures under seismic loads.

Competencies

After completing the course, students will be able to manage issues related to the use of structural materials and make informed decisions for the design and operation of civil engineering projects.
In particular, students will be able to:

- Evaluate and assess the technical and economic factors involved in selecting experimental

methods.

- Formulate and propose optimal or innovative solutions based on these evaluations.

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
thinking 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
……
Others…
…….

The students acquire the following general competences:

1. *Search for, analysis and synthesis of data and information with the use of the necessary technology*
2. *Adapting to new situations*
3. *Decision-making*
4. *Production of free, creative and inductive thought*
5. *Criticism and self-criticism*
6. *Respect for the natural environment*

(3) SYLLABUS

The course emphasizes the analysis and design of reinforced concrete structures and structural bearing elements under seismic loading. It explores the role of the structures' flexibility and the importance of the regularity of the framework in seismic behavior. Students will gain an in-depth understanding of the expected failure modes and the most appropriate reinforcement techniques.

Additionally, the course covers the role of joints and their proper design to prevent premature failure. It also includes content related to the design of shear walls and foundations.

Week-by-week course outline:

Week 1: • Introduction to the concept of plasticity.
Week 2: • Seismic loads and earthquake-resistant design.
Week 3: • Design against shear under seismic loading.
Week 4: • Capacity design of frame joints.
Week 5: • Capacity design against brittle modes of failure.
Week 6: • Design of frame joints.
Week 7: • Check for torsional effects.
Week 8: • Joint adequacy checks.
Week 9: • Exercises on capacity design.
Week 10: • Design of shear walls.
Week 11: • Design of shear walls (exercises).
Week 12: • Limit state design against punching.
Week 13: • Design of foundations.
Week 14: • Design of foundations (exercises).

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use of ICT in teaching, laboratory education, communication with students via E-class

TEACHING METHODS

The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements,

Activity	*Semester workload*
Lectures	14*4= 56 hours
Study	14*6= 84 hours

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*	Examination	*4* hours
	Course total	*144* hours
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.*	**Language of Evaluation** Greek **Evaluation methods** 100% Written exam *multiple choice questionnaires* *short-answer questions* *problem solving* The examination is designed to test both the knowledge and judgment of students.	

(5) RECOMMENDED BIBLIOGRAPHY

-Suggested bibliography:

1. J Designers' Guide to EN 1998-1 and EN 1998-5, M.N.Fardis, E.Carvalho, A.Elnashai, E.Faccioli, P.Pinto, A.Plumier, Thomas Telford.
2. Seismic Design, Assessment and retrofitting of Concrete Buildings, M.N.Fardis, Springer.
3. Eurocode 2 Part 1-1 (EN1992-1-1)
4. Eurocode 8: Part 1 (EN 1998-1)