1.1.1 Reinforced Concrete III

GENERAL

SCHOOL	Engineering		
ACADEMIC UNIT	CIVIL ENGINEERING		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ΔΟΜ024	**SEMESTER**	8th
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, specialised general knowledge, skills development*	Scientific Field
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	https://elearning.cm.ihu.gr/course/view.php?id=990

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*

Upon successful completion of this course, students will be able to:

- know the basic water and wastewater treatment processes
- distinguish and explain the treatment stages of a municipal wastewater treatment plant
- analyse water quality characteristics and distinguish water pollution
- calculate the hydraulic layout of municipal wastewater treatment projects
- assess water and wastewater treatment studies
- prepare a technical report containing the sanitary calculations, hydraulic calculations and general arrangement drawings of relative projects

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*
	Respect for the natural environment

Decision-making *Working independently* *Team work* *Working in an international environment* *Working in an interdisciplinary environment* *Production of new research ideas*	*Showing social, professional and ethical responsibility and sensitivity to gender issues* *Criticism and self-criticism* *Production of free, creative and inductive thinking* *……* *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 interdisciplinary environment
- Project planning and management
- Criticism and self-criticism
- Production of free, creative and inductive thinking

SYLLABUS

• Seismic design actions according to Eurocode 8 for frame and dual reinforced concrete structures
• Medium and high ductility structures according to Eurocode 8
• Capacity design of beams, columns and shear walls. Avoidance of soft-storey failure, of local plasticity checks.
• Dimensioning of reinforced concrete shear walls (design envelopes against bending and shear)
• Medium and high ductility nodes
• Simulation of a dual reinforced concrete structure (frames and walls) in a finite element program. Calculation of element forces envelopes.
• Pathology of reinforced concrete structures

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*	
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*	
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*	1. Assignment of tasks aimed at exploring the understanding of the concepts taught (30%). 2. Final written exam (in Greek) at the end of the semester (70%). 3. Each student is given the opportunity to review their written exam and have their mistakes analyzed.

Activity	***Semester workload***
Lectures	26
Practice/exercises	26
Project(s)	20
Individual study	58
Course total (26 hours workload per ECTS credit)	***130***

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.*	

ATTACHED BIBLIOGRAPHY

Penelis G., Stylianidis K., Kappos A., Ignatakis Ch., Design of Reinforced Concrete Structures According to the New Concrete and Seismic Codes, AUTh publ., 1995 (in Greek)

Georgopoulos Th., Reinforced Concrete vol. II, Georgopoulos publ., 2015 (in Greek)

Tsonos A.D., Design of Reinforced Concrete Structures according to the Eurocodes, Sofia publ., 2016 (in Greek)

Penelis G Penelis Gr., Concrete Buildings in Seismic Regions, 2nd ed, 2019, Taylor Francis

Karayiannis Ch., Design and Performance of Reinforced Concrete Structures for Seismic Loads, Sofia publ., 2016 (in Greek)

Konstantinidis Ap., Earthquake Resistant Buildings made of reinforced concrete. Static and dynamic analysis, π-Systems, 2013

Konstantinidis Ap., Earthquake Resistant Buildings made of reinforced concrete. made of reinforced concrete, The Art of Construction and the Detailing, π-Systems, 2014