

1.1.1 Reinforced Concrete II

GENERAL

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| SCHOOL | Engineering | | |
| ACADEMIC UNIT | CIVIL ENGINEERING | | |
| LEVEL OF STUDIES | Undergraduate | | |
| COURSE CODE | ΔOM013 | SEMESTER | 5th |
| COURSE TITLE | Reinforced Concrete II | | |
| 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 | |
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| <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> | 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=773 | | |

LEARNING OUTCOMES

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| <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><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i> |
| <p>Upon successful completion of the course, students will be able to:</p> <ol style="list-style-type: none"> 1. Calculate loads and element forces in reinforced concrete slabs and transfer loads from slabs to beams. 2. Recognize the types of slabs and dimension one-way or two-way supported slabs according to Eurocode 2. 3. Dimension linear elements of reinforced concrete in torsion according to Eurocode 2. 4. Model reinforced concrete frame structures using finite element analysis software for appropriate combinations of loads in ultimate and serviceability limit states and calculate the envelopes of element forces 5. Draw the construction plan with the developments and reinforcement details of the reinforced concrete elements. |
| <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> |

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| <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>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Production of new research ideas</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> <i>Production of free, creative and inductive thinking</i> <i>Others...</i> |
| - 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

- Reinforced concrete slabs. Types of slabs and design of simply and cross-reinforced slabs.
- Load-balancing method. Resolution of slabs using the Czerny tables.
- Strip method. Resolution of slabs using the Markus tables.
- Design in torsion.
- Load combinations for gravity and seismic actions. Alternating loads and stress envelopes.
- Dimensioning of linear reinforced concrete elements (beams/columns) for gravity and seismic actions.
- Simulation of a reinforced concrete frame in a finite element program. Calculation of stress envelopes. Dimensioning.
- Construction plan. Reinforcement details.

TEACHING and LEARNING METHODS - EVALUATION

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| 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.</i> <i>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 | 26 |
| | Practice/exercises | 26 |
| | Project(s) | 20 |
| | Individual study | 58 |
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| | Course total (26 hours workload per ECTS credit) | 130 |
| STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> | 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 | |

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| <p><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></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p> | <p>(70%).</p> <p>3. Each student is given the opportunity to review their written exam and have their mistakes analyzed.</p> |
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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)
- Tsonos A.D., Design of Reinforced Concrete Structures according to the Eurocodes, Sofia publ., 2016 (in Greek)
- Georgopoulos Th., Reinforced Concrete vol. I, Georgopoulos publ., 2015 (in Greek)
- Georgopoulos Th., Reinforced Concrete vol. II, Georgopoulos publ., 2015 (in Greek)
- Zararis P., Reinforced Concrete Calculation Methods, Kyriakidis publ., 2002 (in Greek)