# COURSE OUTLINE

(1) **GENERAL**

<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>SCHOOL OF ENGINEERING</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACADEMIC UNIT</td>
<td>DEPARTMENT OF CIVIL ENGINEERING</td>
</tr>
<tr>
<td>LEVEL OF STUDIES</td>
<td>POST GRADUATE</td>
</tr>
<tr>
<td>COURSE CODE</td>
<td>CE7112</td>
</tr>
<tr>
<td>SEMESTER</td>
<td>SPRING (2ⁿ)</td>
</tr>
<tr>
<td>COURSE TITLE</td>
<td>Structural Design in Concrete and Steel</td>
</tr>
</tbody>
</table>

**INDEPENDENT TEACHING ACTIVITIES**

<table>
<thead>
<tr>
<th>WEEKLY TEACHING HOURS</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lectures</td>
<td>6</td>
</tr>
</tbody>
</table>

6 (total) 30 (total)

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

**LANGUAGE OF INSTRUCTION AND EXAMINATIONS:**

- English (official)

**COURSE WEBSITE (URL):**

http://civilmsc.teipir.gr/phpbb/viewforum.php?f=16&sid=084664a8a8abe5a7f4b5f5f981a9ef9d93b
(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

On successful completion of the module, students will be able to:
- Analyse, design and detail reinforced and pre-stressed concrete elements incl. flat slabs and post-tensioned slabs to EC2.
- Carry out the conceptual design incl. design for stability and robustness of multi-storey concrete framed buildings.
- Specify sustainable modern concretes incl. Self Compacting Concrete, High Strength Concrete, Admixtures and Additions, etc. in accordance with up-to-date practice.
- Critically compare various methods of design with steel such as simple, continuous and semi-rigid and carry out plastic analysis of steel frames.
- Analyse, design and detail incl. fire resistance requirements of steel elements such as beams, columns and composite floors to EC3.
- Design single and multi-bay industrial structures in steel including bolted and welded connections

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
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,
Project planning and management,
Production of free, creative and inductive thinking.

(3) SYLLABUS

This module is a core module for the MSc Structural Design and Construction Management and the MSc Civil Engineering. The module covers latest developments in specification, design and detail of reinforced and pre-stressed concrete framed buildings and steel framed structures. Methods of analysis and structural design are in accordance with Eurocode 2 (EC2) and Eurocode 3 (EC3) for concrete and steel respectively.
### (1) TEACHING and LEARNING METHODS - EVALUATION

<table>
<thead>
<tr>
<th>DELIVERY</th>
<th>A variety of lectures and tutorials</th>
</tr>
</thead>
<tbody>
<tr>
<td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</td>
<td>Lecture material, tutorials and case studies will be made available on StudySpace.</td>
</tr>
</tbody>
</table>

#### 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.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Semester workload</th>
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<tbody>
<tr>
<td>Lectures</td>
<td>60</td>
</tr>
<tr>
<td>study</td>
<td>240</td>
</tr>
</tbody>
</table>

Course total 300

#### 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.

- Coursework (concrete) total 50%: The brief of the Concrete Structural Design Competition by The Concrete Centre will be used as a template.
- Examination (steel) total 50%: four questions, max 12.5% each, open book exam

### (2) ATTACHED BIBLIOGRAPHY

#### Core Texts:


#### Recommended Reading:
British Standards Institution for Eurocodes (www.bsigroup.co.uk) including EC2 for concrete, EC3 for steel, EC1 for actions, etc.

The Concrete Centre for EC2 (www.concretecentre.com) including How-to design to EC2 guides, Concise EC2, Scheme Design Manual, etc.

The Concrete Society for Technical Reports (www.concrete.org.uk) including TR43 for PT slabs, TR58 for deflections, TR64 for flat slabs, etc.

The Steel Construction Information System for EC3 (www.steelconstruction.info) including key resources, design guides, software, CPD courses, etc.