

### 1.1.1 Steel Structures I

#### GENERAL

<b>SCHOOL</b>	Engineering		
<b>ACADEMIC UNIT</b>	CIVIL ENGINEERING		
<b>LEVEL OF STUDIES</b>	Undergraduate		
<b>COURSE CODE</b>	ΔOM016	<b>SEMESTER</b>	6th
<b>COURSE TITLE</b>	Steel Structures I		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <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>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>	
	4	4	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	Scientific Field		
<b>PREREQUISITE COURSES:</b>			
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	No		
<b>COURSE WEBSITE (URL)</b>	<a href="https://elearning.cm.ihu.gr/course/view.php?id=863">https://elearning.cm.ihu.gr/course/view.php?id=863</a>		

#### LEARNING OUTCOMES

<p><b>Learning outcomes</b></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"> <li>• Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</li> <li>• Descriptors for Levels 6, 7 &amp; 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</li> <li>• Guidelines for writing Learning Outcomes</li> </ul>						
<p>Upon the successful completion of the course the students are anticipated to:</p> <ul style="list-style-type: none"> <li>- Understand the load resisting mechanisms in typical steel structures;</li> <li>- Understand and analyse the mechanical behaviour of beam-type steel members;</li> <li>- Identify possible failure mechanisms;</li> <li>- Check and design steel members according to the Eurocode 3 provisions.</li> </ul>						
<p><b>General Competences</b></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></td> <td style="width: 50%; border: none;"><i>Project planning and management</i></td> </tr> <tr> <td style="border: none;"><i>Adapting to new situations</i></td> <td style="border: none;"><i>Respect for difference and multiculturalism</i></td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;"><i>Respect for the natural environment</i></td> </tr> </table>	<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>	<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>		<i>Respect for the natural environment</i>
<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>					
<i>Adapting to new situations</i>	<i>Respect for difference and multiculturalism</i>					
	<i>Respect for the natural environment</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>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> .....
<ul style="list-style-type: none"> <li>- Search, analysis and synthesis of information and data using the appropriate technology</li> <li>- Decision making</li> <li>- Student individual project</li> <li>- Project planning and management</li> <li>- Criticism and self-criticism</li> <li>- Production of free, creative and inductive thinking</li> </ul>	

## SYLLABUS

Structural steel: mechanical properties and typical structural applications. Structural analysis and Eurocode 3 provisions for the design of steel structures. Load combinations. Ultimate and serviceability limit states. Local buckling and cross-section classification. Resistance of steel cross-sections and steel members under tension, compression, bending, shear and combined action effects. Buckling resistance of steel members. Flexural and lateral-torsional buckling. Structural layouts and load resisting mechanisms of typical steel structures.

## TEACHING and LEARNING METHODS - EVALUATION

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	Face to face.	
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>		
<b>TEACHING METHODS</b> <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>	<b>Activity</b>	<b>Semester workload</b>
	Lectures	42
	Individual study	62
	Course total (26 hours workload per ECTS credit)	<b>104</b>
<b>STUDENT PERFORMANCE EVALUATION</b> <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>	Formative evaluation consisting of: <ul style="list-style-type: none"> <li>- Non-compulsory homework exercises focusing on problem solving</li> <li>- Final written exams comprising problem-solving questions</li> </ul>	

## ATTACHED BIBLIOGRAPHY

- Vayas, I., Ermopoulos, J., Ioannidis, G. 2005. Design of steel structures – According to the final version of Eurocodes. Publisher: Κλειδάριθμος, ISBN: 978-960-461-582-7 (in Greek)
- Baniotopoulos, C.K. 2009. Steel structures – Design principles according to Eurocode 3. Publisher: Ζήτη, ISBN: 978-960-456-184-1 (in Greek)
- Baniotopoulos, C.K. Nikolaidis, T.N. 2012. Steel structures, Design examples according to Eurocode 3. Publisher: Ζήτη, ISBN: 978-960-456-323-4 (in Greek)
- Aldinger, E., Baumann, G., Ignatowitz, E. 1995. Steel Structures. Publisher: Ευρωπαϊκές Τεχνολογικές Εκδόσεις, ISBN: 9789603310358 (in Greek)
- Lammlin, G., 2010. Metal structures. Publisher: ΙΩΝ, ISBN: 978-960-331-469-1 (in Greek)
- Pavlou, G. D. Steel structures, 2014. Publisher: ΙΩΝ, ISBN: 978-960-508-136-2 (in Greek)
- Giannopoulos A.C. Metal structures, 2005. Publisher: Gotsis, ISBN:9789604115259 (in Greek)