

Course Name: STEEL STRUCTURES I				
Course Code	Course Status	Semester	ECTS Credits	Number of classes
	Compulsory	V	5	2P+1V+1L
Study programmes: Undergraduate academic studies - study programme Civil Engineering; 6 semesters / 180 ECTS credits.				
Conditioned by other courses: Building materials, Strength of materials I & II.				
Aims of the course: Getting basic knowledge in steel structures design.				
Learning outcomes: After passing this exam, student will be able to: 1. Know basic terms concerning steel structures. 2. Know historical development of steel structures and their production technology. 3. Know advantages and disadvantages of steel structures. 4. Know all kinds of steel products used in civil engineering. 5. Design basic structural elements in steel structures.				
Teacher and assistant: Prof. Duško Lučić, Dr-Ing. – teacher Mladen Muhadinović, MSc; Petar Subotić, MSc – assistants				
Methods of teaching and learning: Lectures, exercises, laboratory exercises, consultations, semester project.				
Course content:				
I teaching week	Introduction – General about steel structures. Steel production technology and historical development. Application domains. Advantages and disadvantages of steel structures. The most important objects. Process of structural design. Eurocodes for steel structures. Ultimate limit states (ULS). Serviceability limit states (SLS). Combinations of actions.			
II teaching week	Steel properties. Steel grades. Steel products. Notation and conventions. Classification of cross sections. ULS. Resistance of cross section. Buckling resistance of members.			
III teaching week	Resistance of cross section. Cross section properties – gross/net section. Tension.			
IV teaching week	Resistance of cross section. Compression. Bending moment.			
V teaching week	Resistance of cross section. Shear. Torsion.			
VI teaching week	Resistance of cross section. Bending and shear. Bending and axial force. Bending, shear and axial force.			
VII teaching week	Resistance of cross section. Bending and shear. Bending and axial force. Bending, shear and axial force.			
VIII teaching week	Recapitulation and practice.			
IX teaching week	Buckling resistance of members. Flexural and torsional buckling. Theory of elastic buckling in linear domain.			
X teaching week	Compressed uniform members. Buckling length. Buckling in non-linear domain. Buckling curves. Slenderness.			
XI teaching week	Compressed uniform built-up members. Laced and battened compressed elements.			
XII teaching week	Uniform members in bending. Lateral torsional buckling.			
XIII teaching week	Uniform members in bending and axial compression.			
XIV teaching week	Software application in design. Commercial and free software. Advantages, challenges and dangers.			
XV teaching week	Semester wrap-up and final preparation for the examination.			
Student's obligations: Attending of lectures and exercises, elaboration of semester project, tests.				
STUDENTS LOAD				
<u>Per week</u>		<u>In semester</u>		
5 credits x 40/30 = <u>6.67 hours</u>		Teaching and final exam: (6.67 hours) x 16 = <u>106.67 hours</u>		
Structure: 2 hours lectures 2 hours exercises 2.67 hours individual work, including consultations		Necessary preparations before semester (administration, enrolment etc) 2 x (6.67 hours) = <u>13.33 hours</u>		
		Total load for the course: <u>5x30 =150 hours</u>		
		Additional work for exam preparation in the additional exam session, including passing of correctional exam <u>between 0 and 30 hours</u> (remaining time from the previous issues to the final load for the course of 150 hours)		
		Load structure: 106.67 hours (teaching) + 13.33 hours (preparation) + 30 hours (additional work)		
Literature:				
1. MEST EN 1993-1-1. 2. MEST EN 1990. 3. MEST EN 1993-1-10. 4. N. Trahair, M. Bradford, et al: The behaviour and design of steel structures to EC3. 5. L.S. Da Silva, R. Simoes, H. Gervasio: Design of steel structures EC3: Part 1-1-General rules and rules for buildings. 6. L. Gardner, D. Nethercot: Designers guide to Eurocode 3: Design of steel buildings. 7. Z. Marković: Granična stanja čeličnih konstrukcija.				
Examining system and grading:				
Examining is continuous during the semester and in the final exam. Maximum number of points in semester: 100. The structure of examination and points is as follows: - semester project: up to 30 points; - tests: up to 10 points; - final exam: up to 60 points. Defence of semester project is in oral form. Tests and final exam are in written form. Following grading system is applied: A for ≥ 90 points, B for $80 \leq \text{points} < 90$, C for $70 \leq \text{points} < 80$, D for $60 \leq \text{points} < 70$, E for $50 \leq \text{points} < 60$, F for < 50 points. Positive grade is obtained for min 50 points. F = failed.				
Special notes for the course:				
Data prepared by teacher: Prof. Duško Lučić Dr-Ing.				
Note: Additional information on course may be obtained from course teacher, assistant, head of the study programme and vice-dean for teaching.				