SYLLABUS

1. Data about the program of study

1.1	Institution	The Technical University of Cluj-Napoca		
1.2	Faculty	Faculty of Civil Engineering		
1.3	Department	Structures		
1.4	Field of study	Civil Engineering		
1.5	Cycle of study	Bachelor of Science		
1.6	Program of study/Qualification	CCIA English/Engineer		
1.7	Form of education	Full time		
1.8	Subject code			

2. Data about the subject

2.1	2.1 Subject name			Steel Structures I				
2.2 Subject area			Structural Engineering					
2.3	2.3 Course responsible/lecturer			Associated Professor Ioan Petran				
2.4	2.4 Teachers in charge of seminars			Lecturer Paul Per	nes			
2.5 ۱	ear of study	III	2.6 Semester	VI	2.7 Assessment	Exam	2.8 Subject category	

3. Estimated total time

3.1 Ni	umber of hours per week	4	3.2 of w	hich, course:	2	3.3 applications:	2
3.4 Tc	otal hours in the curriculum	56	3.5 of w	hich, course:	28	3.6 applications:	28
Indiv	idual study				•	·	hours
Man	ual, lecture material and notes,	, bibliogr	raphy				20
Supplementary study in the library, online and in the field					5		
Prep	aration for seminars/laboratory	y works,	homewo	ork, reports, po	rtfolios,	essays	18
Tuto	ring						2
Exam	ns and tests						3
Othe	r activities						
3.7	Total hours of individual stud	У	48				

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3.8	Total hours per semester	104
3.9	Number of credit points	4

4. Pre-requisites (where appropriate)

4.1	Curriculum	
4.2	Competence	Loads evaluation and structural analysis

5. Requirements (where appropriate)

5.1	For the course	N/A
5.2	For the applications	N/A

6. Specific competences

		Advantages and disadvantages of steel structures
la	Ses	Standard tests on steel material
sior	tenc	Bolted connection types, characteristics, position
Professional	competences	Welded connections types and technology of welding
Pro	con	Cross section types for steel elements
		Steel elements subjected to axial loads
	es	Number and position of bolts in case of a bolted connection
SS	ence	Type and characteristics of welded seams in case of a welded connections
Cross	pete	Sizing and checking for a steel element subjected to tension and centric compression force
Ŭ	competences	
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7. Discipline objectives (as results from the *key competences gained*)

7.1	General objective	Developing ability to design steel connections
7.2	Specific objectives	Sizing and checking steel joints

8. Contents

8.1. Lecture (syllabus)	Teaching methods	Notes
1.Steel fabrication and steel products; Structure of carbon steel	5	
and alloy steels		
2. The influence of alloying on the mechanical characteristics of		
steel; Heat treatments		
3.Structural steel for buildings		
4.Corrosion behaviour of steel elements		
5.Calculation procedure for steel structures; Romanian standards		
(STAS) and Eurocode 3(EC 3)		
6.Mean of joinings and gripings; Romanian standards and EC 3		
7.Riveted connections; Details and calculation of riveted		
connections	Presentation	Video-projector
8.Ordinary bolted connections; Details and calculation of them		
9. High-strength bolted connections; Details and calculation of		
them		
10.Welded connections; Fillet welds; Butt welds		
11.Technology of welds; welding procedures; welding defects and		
control		
12.Design resistance of fillet welds; design resistance of butt		
welds		
13.Centric tensioned bars; centric compressed bars		
14.Centric compressed bars; buckling phenomena		

Bibliography

1. Ioan Petran, Roland Mihai Senila – Design of pitched roof steel portal frame structure, Ed. Mediamira, Cluj-Napoca, 2017

2.SR EN 1993-1-8 Eurocode 3:Design of steel structures, 2006

3.ECCS No 126, TC 10 Structural Connections, European Recommendations for de design of Structural connections according to Eurocode 3, 2003

4. Arcelor profiles-Beams, channels and merchant bars, Arcelor Group, 2005

1.Steel qualities.Choice of steel for building elements.Range of laminates22.Regular bolted connections.Constructive prescriptions, bolts presentation, calculation of bolted joints23.Paper no.1-Regular bolted connections.Theme launch. Problem 1:Calculation of articulated connection between a main and a secondary beamsPresentation, workshop, apart 1-84.Explications to solve the problem and technical execution drawingsPresentation, workshop, applicationsEurocode 3 hort 1-86.Paper no.1-Problem 2:Gusset plate connection design -truss type.Calculation of jointPresentation, workshop, applicationsEurocode 3 hort 1-8 applications7.Explications to solve the problem and execution technical drawingsPresentation, workshop, applicationsEurocode 3 hort 1-8 applications9.Joint design9.Joint design.Technical execution drawingsArcelor profiles10.Welded joints.Constructive prescriptions, structure behavior 11.Paper no.4:Connection of an angle section to a gusset plate 12.Connection design, problems13.Technical execution drawings13.Technical execution drawings13.Technical execution drawings14.			1
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2.Regular bolted connections. Constructive prescriptions, bolts presentation, calculation of bolted joints3.Paper no.1-Regular bolted connections. Theme launch. Problem 1:Calculation of articulated connection between a main and a secondary beams4.Explications to solve the problem and technical execution drawings5.Paper no.1-Problem 2:Gusset plate connection design -truss type.Calculation of joint6.Paper no.2-Design of beam-column rigid joint.Connection design7.Explications to solve the problem and execution technical drawings8. Paper no.3-Connections with pretensioned high-strength bolts.Design of beam splices, splice plate design9.Joint design.Technical execution drawings10.Welded joints.Constructive prescriptions, structure behavior 11.Paper no.4:Connection of an angle section to a gusset plate 12.Connection design, problems13.Technical execution drawings	1.Steel qualities.Choice of steel for building elements.Range of		
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	12.Connection design, problems	1	
14.Recapitulation, applications	13.Technical execution drawings	1	
	14.Recapitulation, applications	1	

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

Skills for the future engineers in a frame of design companies and building companies

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade	
10.4 Course	5 question theory problems	Written exam – 2 hours	60%	
10.5 Applications	Design problem solving	Written testing – 45 minutes	40%	
10.6 Minimum standard of performance				
Every position must b	e ≥ 5 mark, including course, a	application and papers no. 1-4		

Date of filling in:		Title Surname Name	Signature
dd.mm.yyyy	Lecturer	Associated Professor Ioan Petran, Phd	
	Teachers in charge of application	Lecturer Paul Pernes, Phd	

Date of approval in the department

Head of department Conf.dr.ing Attila Puskas

Date of approval in the faculty

Dean Conf.dr.ing Nicolae Chira