

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	Structuri
1.4	Field of study	Civil Engineering
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/Qualification	Civil, Industrial and Agricultural Buildings /Engineer (English language)
1.7	Form of education	Full time
1.8	Subject code	64.1

2. Data about the subject

2.1	Subject name				Structuri mixte otel beton						
2.2	Course responsible/lecturer				Prof.Dr.Ing. Nagy Zsolt-Zsolt.Nagy@dst.utcluj.ro						
2.3	Teachers in charge of seminars				Prof.Dr.Ing. Nagy Zsolt-Zsolt.Nagy@dst.utcluj.ro						
2.4	Year of study	4	2.5	Semester	2	2.6	Assessment	E	2.7	Subject category	DS/DO

3. Estimated total time

3.1	Number of hours per week	4	3.2	of which, course:	2	3.3	applications:	
3.4	Total hours in the curriculum	56	3.5	of which, course:	28	3.6	applications:	
Individual study								hours
Manual, lecture material and notes, bibliography								20
Supplementary study in the library, online and in the field								8
Preparation for seminars/laboratory works, homework, reports, portfolios, essays								23
Tutoring								14
Exams and tests								4
Other activities								0
3.7	Total hours of individual study		69					
3.8	Total hours per semester		125					
3.9	Number of credit points		5					

4. Pre-requisites (where appropriate)

4.1	Curriculum	
4.2	Competence	Exam of Steel Structures II.

5. Requirements (where appropriate)

5.1	For the course	
5.2	For the applications	

6. Specific competences

Professional competences	<p>The student shall be familiar with steel and concrete structural systems for buildings: columns, beams, floors, for single story (SS) and multi story (MS) buildings; The student shall be able to use /shall be familiar with design software's for steel and/or concrete structures.</p> <p>Performing the lectures and applications students will be able:</p> <ul style="list-style-type: none"> - to set up composite structural solutions (steel and concrete) for columns, beams, floors, for single story (SS) and multi story (MS) buildings - to perform rational and economic design of composite beams, composite floors, composite columns, - to design composite structures, using a number of available specific products, being able to define list of materials, execution details, - to manage and check the designed construction works <p>Performing the lectures and applications students will be able to handle:</p> <ul style="list-style-type: none"> - design software's for composite column, composite beam and composite floor assemblies, - design software's for complex structural applications which involves composite structures, - BIM modelling technology to prepare design documentation for composite structures
Cross competences	<p>To apply accumulated skills in order to improve the performance in team working, on site or in a design office;</p> <p>To develop own and responsible strategy following the principles, codes and professional ethics.</p>

7. Discipline objectives (as results from the *key competences gained*)

7.1	General objective	Design of steel-concrete composite structures for SS and MS structures for different applications
7.2	Specific objectives	<ol style="list-style-type: none"> 1. Set up of structural solutions for SS and MS structures using composite columns, beams and floors; 2. Quick and efficient design of composite columns, composite beams and composite floors; 3. To prepare design documentation for composite structures; 4. To familiarize with existing composite technologies provided by specific companies in the construction market.

8. Contents

8.1. Lecture (syllabus)	Teaching methods	Notes
Introduction to composite construction of buildings	-	-
Introduction to EC4		
Structural modeling and design		
Composite Slabs with Profiled Steel Sheeting		
Case studies – solution suppliers from the industry		
Shear Connectors and Structural Analysis		
Simply supported beams		
Continuous Beams		

Composite Columns		
Composite joints		
Advanced composite floor systems		
Introduction to Structural Fire Engineering		
Fire Engineering Design of Composite Structures		
Site visit		
Bibliography		
References		
1. EN 1994: Eurocode 4: Design of composite steel and concrete structures - Part 1-1: General rules and rules for buildings		
2. Composite beams and columns to Eurocode 4 Publication no. 72-ECCS		
3. Structural Steelwork Eurocodes Development of a Trans-national Approach		
4. Composite Structures according to Eurocode 4 – worked examples / Darko Dujmović Boris Androić, Ivan Lukačević Print ISBN: 978-3-433-03107-0		
8.2. Applications/Seminars	Teaching methods	Notes
Task launch: design of composite beam	-	-
Configuration, evaluation, shuttering selection		
Design calculations of composite beam		
Design calculations of composite beam, sketches beam		
Stage 1: deadline for composite beam design		
Start of the project: design of composite beam		
Configuration, evaluation, Design calculations of composite column		
Design calculations of composite column, sketches column		
Stage 2: deadline for composite column design		
Start of the project: design of composite floor		
Advanced composite floor systems		
Design calculations of composite floor, sketches floor		
Stage 3: deadline for composite floor design		
Presentations, Evaluation		
Bibliography		
References		
1. EN 1994: Eurocode 4: Design of composite steel and concrete structures - Part 1-1: General rules and rules for buildings		
2. Composite beams and columns to Eurocode 4 Publication no. 72-ECCS		
3. Structural Steelwork Eurocodes Development of a Trans-national Approach		
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9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

Accumulated skills will be necessary for those employees who will be involved in private or public institutions activities dealing with construction works, project management or quality assurance for residential or industrial constructions.

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
10.4 Course	Essay, responding for 3 theoretical question	Written testing –1,5-2 hour evaluation	60%
10.5 Applications	Design application using personal computer	Practical testing –1 hour evaluation	40%
10.6 Minimum standard of performance			
Solving the design application and responding for 2 theoretical questions			

Date of filling in:		Title Surname Name	Signature
	Lecturer	Prof.Dr.Ing. Nagy Zsolt	
	Teachers in charge of application	Prof.Dr.Ing. Nagy Zsolt	

Date of approval in the department	Head of department conf.dr.ing. Attila Puskas
18/06/2025	
Date of approval in the faculty	Dean prof.dr.ing Daniela MANEA
25/06/2025	