

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	Civil, Industrial and Agricultural Buildings /Engineer (English language)
1.7	Form of education	Full time
1.8	Subject code	9.1

2. Data about the subject

2.1	Subject name				Istoria ingineriei constructiilor						
2.2	Course responsible/lecturer				Sl.Dr.Ing. Olar Radu-Ioan-Radu.Olar@dst.utcluj.ro						
2.3	Teachers in charge of seminars										
2.4	Year of study	1	2.5	Semester	1	2.6	Assessment	C	2.7	Subject category	DC/DO

3. Estimated total time

3.1	Number of hours per week	2	3.2	of which, course:	2	3.3	applications:	
3.4	Total hours in the curriculum	28	3.5	of which, course:	28	3.6	applications:	
Individual study								hours
Manual, lecture material and notes, bibliography								10
Supplementary study in the library, online and in the field								5
Preparation for seminars/laboratory works, homework, reports, portfolios, essays								5
Tutoring								1
Exams and tests								1
Other activities								0
3.7	Total hours of individual study		22					
3.8	Total hours per semester		50					
3.9	Number of credit points		2					

4. Pre-requisites (where appropriate)

4.1	Curriculum	Curriculum
4.2	Competence	Competence

5. Requirements (where appropriate)

5.1	For the course	For the course
5.2	For the applications	For the applications

6. Specific competences

Professional competences	<p>C1. Recognition of constructions elements and structures from the civil engineering field, specific to the study program.</p> <p>C1.1 Structures and structural systems evolution, history and chronology from antiquity to the present.</p> <p>C1.2 Identifying the role of structural and functional elements in civil, industrial and agricultural buildings.</p> <p>C1.3 Explaining constructive composition of different civil, industrial and agricultural buildings.</p> <p>C1.4 Evaluation of the quality for constructions in civil, industrial and agricultural domain, using specific evaluation criteria.</p> <p>C2. Principles and methods for pre-sizing and dimensioning of construction elements in the field of civil engineering, specific to the Civil Engineering study program</p> <p>C2.1 Identification of the construction materials and the types of structures in constructions, and their historical evolution.</p> <p>C2.2 Description of loads actions and the establishment of the loads values by correlation with local factors</p> <p>C3. Technological and economic design related with the execution, operation and maintenance of constructions in the field of civil engineering, specific to the Civil, Industrial and Agricultural Constructions program.</p> <p>C3.1 Description of the technological processes for execution works to civil, industrial and agricultural constructions.</p> <p>C3.2 The properties of building materials and technologies for execution works for civil, industrial and agricultural constructions.</p> <p>C4. Compliance with specific quality and sustainable development requirements for civil, industrial and agricultural constructions.</p> <p>C4.1 Identification and use of technical regulations specific to a civil, industrial and agricultural constructions.</p>
Cross competences	<p>T2. Accommodation with the roles and activities specific to teamwork and distribution of tasks for subordinate levels.</p> <p>CT2. Applying efficient teamwork techniques, on various hierarchical levels.</p> <p>T3. Awareness of the need for lifelong learning: efficient use of learning resources and techniques for personal and professional development.</p> <p>CT3. Documentation for professional and personal development, through continuous training and efficient adaptation to new technical specifications.</p>

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

7.1	General objective	Understanding the structural mechanisms and the relationship between the level of technical knowledge and constructions
7.2	Specific objectives	Assimilation of theoretical knowledges on the role and evolution of constructions

8. Contents

8.1. Lecture (syllabus)	Teaching methods	Notes
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Civil Engineering - Past, present and future		
Ancient structures: from Sumerians to Persians; the constructions of ancient Egypt; Antic Greece		
Roman Engineering - structural systems and construction techniques of the Roman Empire		
Constructions of the Middle Ages, the technical and structural evolution. The development of natural sciences and technology		
The industrial revolution - the first metal structures, the bases of the strength calculation.		
The development of construction science and engineering, new materials and technologies, the evolution of structural forms, the evolution of the cement manufacturing process, the development of metallurgy, the first uses of reinforced concrete.		
The history of the science of resistance design in construction. Modern software tools for analyzing the behavior under applied loads (permanent, live, variable, wind, snow, earthquake), for calculating and detailing structural elements. Application examples.		
Multistoried structures - structural concepts, calculation models, execution techniques. Example of structural analysis and calculation using professional CAD tools		
Industrial and agricultural constructions - structural concepts, calculation models, execution techniques. Example of structural analysis and calculation using professional CAD tools		
Bridges, tunnels and oil rigs - structural concepts, structural design models, execution techniques. Example of structural analysis and calculation using professional CAD tools		
Current knowledge of construction engineering science used to analyze structural and execution solutions of ancient buildings. Applied example - the Pantheon in Rome		
Standards in construction - appearance, development, content and use in practice in design and execution.		
The constructions of the modern era: techniques, tendencies, areas of development		
Technical debates on important topics related to the most special constructions in the world		
Bibliography Bibliography 1) Istoria tehnicii și a industriei românești Vol. 1 Coordonator: Dorel Banabic, Editura Academiei Române, București, 2019 2) Istoria tehnicii și a industriei românești Vol. 2 Coordonator: Dorel Banabic, Editura Academiei Române, București, 2020 3) Kiss Z.: Ultimii mesteri – primii ingineri Teoria care a schimbat meseria de constructor (I), Revista construcțiilor nr. 162, Septembrie 2019 4) Kiss Z.: Ultimii mesteri – primii ingineri Teoria care a schimbat meseria de constructor (II), Revista construcțiilor nr. 163, Octombrie 2019 5) Benvenuto F.: An introduction to the History of structural Mechanics, Part I: Statics and Resistance of Solids 6) Kurrer K. E., The History of the Theory of Structures From Arch Analysis to Computational Mechanics, Ernst&Sohn, 2008 7) Kurrer K. E., The History of the Theory of Structures Searching for Equilibrium, Ernst&Sohn, 2018 8) Addis B., Building: 3000 Years of Design Engineering and Construction, Phaidon Press, 2015		

Virtual didactic materials		
1. Movies and images of buildings systems, technologies and construction materials.		
8.2. Applications/Seminars	Teaching methods	Notes
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Current knowledge of construction engineering science used to analyze structural and execution solutions of ancient buildings. Applied example - the Pantheon in Rome		
Bibliography		

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

During the semester period, visits on the construction sites can be organised in order to present to the students practical aspects related with the execution and structural design. Direct contact with the representatives of the companies are also possible.

The students learned skills will be used in the future as employees who will carry out their activity in the field of constructions

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
10.4 Course	Quality evaluations performed by analysis, synthesis, generalization of data obtained through its own investigation and acquirements	The evaluation consists in written test, onsite - 1 hour	100%
10.5 Applications			
10.6 Minimum standard of performance			
N≥5.00			
OBS:			
The final grade will take into account the involvement of the student during the semester: participation in debates, scientific sessions, frequency etc.			

Date of filling in:		Title Surname Name	Signature
	Lecturer	Sl.Dr.Ing. Olar Radu-Ioan	
	Teachers in charge of application		

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