

## Course/studio syllabi

### 1. Data on the study programme

1.1 Institution	Technical University of Cluj-Napoca
1.2 Faculty	of Architecture and Urban Planning
1.3 Department	<b>Urban Planning and Technical Sciences</b>
1.4 Domain	<b>Architecture</b>
1.5 University level	Licence and master's degree
1.6 Study programme/Qualification	Architecture
1.7 Form of studies	IF – on-site full-time studies
1.8 Course / studio code	<b>24.00</b>

### 2. Data on the course

2.1 Name of the course	<b>Structural Mechanics</b>				
2.2 Course/ Studio Head	<b>Lecturer Radu HULEA</b>				
2.3 Head of seminary/ laboratory/ studio	-				
2.4 Study year	<b>2</b>	2.5 Semester	<b>1</b>	2.6 Type of evaluation	<b>Exam</b>
2.7 Course /studio regime	Formative category: fundamental (DF)/ linked to the domain (DD)/ specific (DS)/ complementary (DC)				<b>DD</b>
	Compulsory (DI)/ Optional/ (DOP)/ Voluntary (DFac)				<b>DI</b>

### 3. Total estimated time

3.1 Number of hours/week	<b>4</b>	out of which:	3.2 Course	<b>2</b>	3.3 Seminary	2	3.3 Laboratory	0	3.3 Project	0
3.4 Number of hours/semester	100	out of which:	3.5 Course	28	3.6 Seminary	28	3.6 Laboratory	0	3.6 Project	0
3.7 Distribution of time (hours)/ semester for:										
(a) Individual study supported by course textbook, course text, bibliography, and notes										28
(b) Supplementary study in the library, online, and on site										
(c) Preparation for seminars/ laboratories/ assignments, reports, portfolios, and essays										14
(d) Tutoring										
(e) Examination										2
(f) Other activities										-
3.8 Total hours of individual study (sum (3.7(a)...3.7(f)))					<b>44</b>					
3.9 Total semestrial hours (3.4+3.8)					<b>100</b>					
3.10 Number of credits					<b>4</b>					

### 4. Preconditions (where applicable)

4.1 curriculum preconditions	-
4.2 competence preconditions	Competences and knowledge acquired in fundamental courses such as: <i>Mathematics</i> may constitute a basis for a good understanding of notions and information discussed in the present course.

### 5. Conditions (where applicable)

5.1. for the course	On site, in the allocated classroom (according to the faculty schedule). Attendance is a condition for examination. See also „10. Assessment method”.
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5.2. for the seminary	On site, in the allocated classroom (according to the faculty schedule). Attendance is a condition for examination. See also „10. Assessment method”.-
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## 6. Specific competencies

<ul style="list-style-type: none"> <li>• Technical knowledge of structure, materials, and construction.</li> <li>• Awareness of the impact of geotechnical conditions on construction</li> <li>• Understanding of the impact of climate on urban and architectural design and construction.</li> <li>• Ability to act with innovative technical competence in the use of building techniques and the understanding of their evolution.</li> <li>• Understanding of the processes of technical design and the integration of structure, construction technologies and services systems into a functionally effective whole.</li> <li>• Understanding of services systems as well as systems of transportation, communication, maintenance, and safety.</li> <li>• Awareness of the role of technical documentation and specifications in design realisation, and of the processes of construction, cost, planning and control.</li> </ul>
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## 7. Objectives of the discipline

7.1 General objective of the discipline	<ul style="list-style-type: none"> <li>• Acquiring the main concepts and principles of structural mechanics in order to successfully approach the technical disciplines in the upper years.</li> </ul>
7.2 Specific objectives	<ul style="list-style-type: none"> <li>• Developing an intuitive sense about the state of stress and strain, deformations of a structural element subjected to external loads.</li> <li>• Applying the basic principles of structural mechanics in order to approach the process of sizing or checking for different structural elements at an elementary level.</li> </ul>

## 8. Content/Syllabi

8.1 Course	No. of hours	Teaching methods	Notes
<b>C1</b> Introduction in mechanics	2	Lectures supported by projections, Discussions on the reader of the course and presentations.	Students are encouraged to engage in talks throughout the course and to present the stage of their individual study.
<b>C2</b> The effect of natural phenomena (actions) on constructions	2		
<b>C3</b> Representation of actions: forces and the moment of a force	2		
<b>C4</b> Behavior of materials	2		
<b>C5</b> Structural elements, schematic representation	2		
<b>C6</b> Deformation of structural elements and geometric properties of the cross section	2		
<b>C7</b> Equilibrium, connections (links), reactions	2		
<b>C8</b> Internal forces	2		
<b>C9</b> Variation of internal forces along structural elements (free body diagram)	2		
<b>C10</b> Tensions	2		
<b>C11</b> Buckling	2		
<b>C12</b> Truss structures	2		

<b>C13</b> Frame structures	2		
<b>C14</b> Conclusions	2		
NOTE: the permanent actualization of the course matter might lead to minor changes in its structure			
<p><b>Bibliography :</b>  IULIU NEGREAN, KALMAN KACSO, CLAUDIU SCHONSTEIN, ADINA DUCA: Mecanică : teorie și aplicații (Cluj-Napoca : U.T.Press, 2012) cotă Observator : 542.860 (2 exemplare)  ADRIAN-IOAN BOTEAN: Rezistența materialelor : solicitări simple (Cluj-Napoca : U.T.Press, 2017) cotă Daicovici : 562.149 (15 exemplare)  JACQUES HEYMAN: Structural analysis : a historical approach (Cambridge, UK : Cambridge University Press, 2007) cotă Daicoviciu : 522.284 (1 exemplar)  Bibliografie recomandată:  PETRU MOGA, ȘTEFAN I. GUȚIU, CĂTĂLIN MOGA: Elemente structurale din oțel : bazele proiectării (Cluj-Napoca : U.T.Press, 2015) cotă 5 : 544.646  BUDIU, Viorica: Teoria structurilor. Vol. 1: Conceperea structurilor, acțiuni, materiale, calculul secțiunilor (Cluj-Napoca : Universitatea Tehnică din Cluj-Napoca, 1995) cotă 482.100/1  PHILIP GARRISON: Basic Structures for Engineers and Architects (Blackwell Publishing, 2005)  RAMSEY DABBY: Structure for Architects (John Wiley &amp; Sons, 2012)</p>			
8.2 Seminary / laboratory / project	No. of hours	Teaching methods	Notes
<b>S1</b> Introduction	2	Seminary supported by projections, Common discussions on theoretical aspects, examples, individual or group studies with 3-4 students.	Students are encouraged to actively contribute with concrete examples in compiling their portfolios
<b>S2</b> Evaluation of actions in constructions	2		
<b>S3</b> Operations with forces and moments I	2		
<b>S4</b> Operations with forces and moments II	2		
<b>S5</b> Analysis of structural materials	2		
<b>S6</b> Deformation of structural elements and geometric properties of the cross section.	2		
<b>S7</b> Reactions	2		
<b>S8</b> Internal forces	2		
<b>S9</b> Free body diagram	2		
<b>S10</b> Free body diagram	2		
<b>S11</b> Tensions	2		
<b>S12</b> Truss structures	2		
<b>S13</b> Frame structures	2		
<b>S14</b> Conclusions	2		
NOTE: the permanent actualization of the course matter might lead to minor changes in its structure			
<p><b>Bibliography :</b>  IULIU Negrean, Kalman Kacso, Claudiu Schonstein, Adina Duca : Mecanică : teorie și aplicații (Cluj-Napoca : U.T.Press, 2012) cotă: 542.860 (2 exemplare)  PETRU MOGA, ȘTEFAN I. GUȚIU, CĂTĂLIN MOGA: Elemente structurale din oțel : bazele proiectării (Cluj-Napoca : U.T.Press, 2015) cotă: 544.646 (5 exemplare)</p>			

### 9. Harmonizing the content of the discipline with the expectations of the epistemic community, the professional associations, and representative employers

The competencies achieved across the course contribute to the consolidation of the professional culture necessary for the profession and to the integrated use of theory and practice.

## 10. Assessment

Type of activity	10.1 Evaluation criteria	10.2 Assessment method	10.3 Calculation of final grade
10.4 Course	-	-	<b>1 point by default</b>
	Relevance and quality of answers	Exam based on the course textbook. This exam will assess the knowledge assimilated, the capacity to make connections and resolve exercises.	<b>9 points</b>
	Calculus of the final grade: as a sum of the points obtained through the evaluation methods described above.		
	According to the ECTS/UTCN Regulations, art. 6.4, the Faculty Council has decided that attending courses is compulsory in a percentage of at least 50%. The situation of attendance will be updated weekly on the Teams channel dedicated to the course. Students who have not attended 50% of the courses will not be able to participate in the final exam and will need to recontract the course.		
10.5 Seminary/Laboratory	-	-	-
10.6 Minimal standard for passing			
<ul style="list-style-type: none"> <li>a grade of minimum 5</li> </ul>			

Date :	Head of course	Title, Name, Surname	Signature
10.01.2024	Course	Lecturer. PHd. eng. Radu HULEA	
	Seminary/Lab	Lecturer. PHd. eng. Radu HULEA	-
		Assistent. PHd. eng. Lidia Maria LUPAN	

Date of validation by the Department Council:	Chief of Department Associate professor Vlad Sebastian Rusu, Arch. PhD
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Date of approval in the Faculty Council:	Dean Associate professor. PhD. arch. Dragoş Şerban Ion ȚIGĂNAŞ
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