

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	Structural Mechanics
1.4	Field of study	Civil Engineering
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/Qualification	Civil Engineering (English)/Civil Engineer
1.7	Form of education	Full time
1.8	Subject code	11

2. Data about the subject

2.1	Subject name	Mechanics I									
2.2	Subject area	Structural Mechanics									
2.3	Course responsible/lecturer	dr. Ovidiu PRODAN									
2.4	Teachers in charge of seminars	dr. Ovidiu PRODAN									
2.5	Year of study	1 st	2.6	Semester	2 nd	2.7	Assessment	Exam	2.8	Subject category	DD DI

3. Estimated total time

3.1	Number of hours per week	5	3.2	of which, course:	2	3.3	applications:	3
3.4	Total hours in the curriculum	70	3.5	of which, course:	28	3.6	applications:	42
Individual study								hours
Manual, lecture material and notes, bibliography								28
Supplementary study in the library, online and in the field								14
Preparation for seminars/laboratory works, homework, reports, portfolios, essays								14
Tutoring								7
Exams and tests								7
Other activities								
3.7	Total hours of individual study	63						
3.8	Total hours per semester	140						
3.9	Number of credit points	5						

4. Pre-requisites (where appropriate)

4.1	Curriculum	none
4.2	Competence	none

5. Requirements (where appropriate)

5.1	For the course	Classroom with blackboard, videoprojector and screen
5.2	For the applications	Labroom

6. Specific competences

Professional competences	<p>After completing the syllabus, the students will be able to:</p> <ul style="list-style-type: none"> - Reduction of system of forces - Constraints applied to bodies and to system of bodies <p>Reactions</p>
Cross competences	<p>Applying efficient and responsible individual and team work strategies, punctuality, industriousness in their projects.</p> <p>Applying efficient communication in team work.</p> <p>Development of self-expression, vocabulary and technical culture.</p> <p>Development of their technical status and active adaptation to new technical specifications.</p>

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

7.1	General objective	To develop skills in Mechanics that includes deterministic way of thinking by procedural approaches.
7.2	Specific objectives	Assimilation of theoretical and practical aspects of Mechanics. Capability of applying concepts of Theoretical Mechanics to Structural (static and dynamic) analysis.

8. Contents

8.1. Lecture (syllabus)	Teaching methods	Notes
<u>Introduction</u> : Vectorial Algebra	Oral and written presentation with examples and comments (stimulating interactivity)	Individual study topics will be announced each week before
<u>Forces</u> : properties; operations with forces;		
<u>Moments of forces</u> : Moment of a force about a pole; Moment of a force about an axis.		
<u>Reductions of general system of forces</u> : Resultant vector; Resultant moment.		
<u>Reduction of particular systems of forces</u> : Reduction of concurrent system of forces; reduction of coplanar system of forces; Reduction of parallel system of forces.		
<u>Equivalence of two general system of forces</u> ;		
<u>Equivalence of particular system of forces</u> ;		
<u>Equilibrium of general systems of forces</u> ;		
<u>Equilibrium of particular systems of forces</u> ;		
<u>Centers of masses</u> ; <u>First moments of area</u> ; centers of masses of discrete and continuous material systems		
<u>Equilibrium of material systems</u> ; Equilibrium of free and constrained particle;		
<u>Equilibrium of material systems</u> ; Equilibrium of free and constrained bodies;		
<u>Equilibrium of material systems</u> ; Equilibrium of systems of bodies; Friction.		
<u>Trusses</u>		
<u>Equilibrium</u> of cables; catenary; Parabola		
<u>Bibliography</u>		

<ol style="list-style-type: none"> Lecture notes. G. M. Barsan, P. Alexa, I. Bors – Mecanica. Statica Maclean and Nelson - Engineering Mechanics, Statics and Dynamics, Shaum's series in Engineering Vector Mechanics for Engineers Vol. I and Vol. II by Joseph E. Shelley Theoretical mechanics lecture notes and sample problems by prof. Vasile SZOLGA A Short Introduction to Theoretical Mechanics by A. Nony Mous 		
8.2. Applications/Seminars	Teaching methods	Notes
<u>Introduction:</u> Vectorial Algebra	Short presentation, examples and solutions with discussion, followed by subjects for each student	Each student must work individually, the solved topics will be checked and assessed weekly by the teacher
<u>Forces:</u> properties; operations with forces;		
<u>Moments of forces:</u> Moment of a force about a pole; Moment of a force about an axis.		
<u>Reductions of general system of forces:</u> Resultant vector; Resultant moment.		
<u>Reduction of particular systems of forces:</u> Reduction of concurrent system of forces; reduction of coplanar system of forces; Reduction of parallel system of forces.		
<u>Equivalence of two general system of forces;</u>		
<u>Equivalence of particular system of forces;</u>		
<u>Equilibrium of general systems of forces;</u> <u>Equilibrium of particular systems of forces;</u>		
<u>Centers of masses; First moments of area;</u> centers of masses of discrete and continuous material systems		
<u>Equilibrium of material systems;</u> Equilibrium of free and constrained particle;		
<u>Equilibrium of material systems;</u> Equilibrium of free and constrained bodies;		
<u>Equilibrium of material systems;</u> Equilibrium of systems of bodies; Friction.		
<u>Trusses</u>		
<u>Equilibrium</u> of cables; catenary; Parabola		
Bibliography		
<ol style="list-style-type: none"> Class notes and handouts. Vector Mechanics for Engineers Vol. I and Vol. II by Joseph E. Shelley 		

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

Mechanics is the theoretical base of a sound technical professional. Including civil engineers. It is, also, the start of Structural analysis (static and dynamic).

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
10.4 Course	Theory (3 questions from theory, - 1.5 hours)	Written test followed by oral examination	40%
10.5 Applications	Activity during the semester (portfolio with solved problems) +	Assessment of tutorial activity	20%

	Solving two applications (1.5 hours)		40%
10.6 Minimum standard of performance			
Solving and handing over of homeworks by deadlines and getting at least 4.5 points individually at each of assessment criteria.			

Date of filling in:		Title Surname Name	Signature
11.10.2019	Lecturer	Dr. Ovidiu PRODAN	
	Teachers in charge of application		

Date of approval in the department	Head of department
_____	Prof.dr.ing.
Date of approval in the faculty	Dean
_____	Prof.dr.ing.