

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	Mecanica constructiilor
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	48.0

2. Data about the subject

2.1	Subject name				Statica si stabilitatea constructiilor III						
2.2	Course responsible/lecturer										
2.3	Teachers in charge of seminars										
2.4	Year of study	3	2.5	Semester	2	2.6	Assessment	C	2.7	Subject category	DID/DI

3. Estimated total time

3.1	Number of hours per week	2	3.2 of which, course:	1	3.3 applications:	
3.4	Total hours in the curriculum	28	3.5 of which, course:	14	3.6 applications:	
Individual study						hours
Manual, lecture material and notes, bibliography						11
Supplementary study in the library, online and in the field						4
Preparation for seminars/laboratory works, homework, reports, portfolios, essays						3
Tutoring						2
Exams and tests						2
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	-
4.2	Competence	-

5. Requirements (where appropriate)

5.1	For the course	-
5.2	For the applications	-

6. Specific competences

Professional competences	1) Structural geometrically non-linear analysis of structures 2) Modelling of structures for Stability analysis 3) Mathematical and energy models of Stability states
Cross competences	1) Non-linearity in structural computation 2) Energy approach to stability of structures 3) A general view of stability state of structures

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

7.1	General objective	Non-linear structural analysis focused on stability state
7.2	Specific objectives	Stability criteria Application of general displacement method to structural stability

8. Contents

8.1. Lecture (syllabus)	Teaching methods	Notes
Geometrical non-linearity in structural analysis	-	-
Non-linear stiffness matrix of multi-storey structures		
Types / states of structural equilibrium		
Static criterion of structural stability		
Equation of neutral equilibrium: solution, interpretation		
Energy criterion of equilibrium of structures		
Dynamic criterion of structural equilibrium		
Bibliography		
Bibliography		
Fundamentals of Structural Stability 1st Edition		
Authors: George Simitses Dewey Hodg		
8.2. Applications/Seminars	Teaching methods	Notes
Stability of a two - storey planar frame - static criterion	-	-
Stiffness matrix - geometrically non-linear		
Equation of stability state & solution		
Stability of a two - storey planar frame - energy criterion		
Stiffness matrix - geometrically non-linear		
Equation of stability state & energy interpretation & solution		
Short review of submitted papers		

Bibliography		

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

Stability analysis constitutes a high understanding of structural behaviour. Non-linear aspects (understanding, modelling, solving) of structural analysis allows for a high qualification of structural engineer.

10. Evaluation

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade
10.4 Course	Ability to formulate stability problem of simple planar structures	Short questions	40%
10.5 Applications	Ability to formulate and apply static and energy criteria to stability analysis	Project submissions	50%
10.6 Minimum standard of performance			
$N = 0.4T + 0.5A_p + 0.1A_t$; A_t = attendance at tutorial activity			

Date of filling in:		Title Surname Name	Signature
	Lecturer		
	Teachers in charge of application		

Date of approval in the department	Head of department conf.dr.ing. Anca-Gabriela POPA
19/06/2025	
Date of approval in the faculty	Dean prof.dr.ing Daniela MANEA
25/06/2025	