SYLLABUS [1]

1. Information about the program

1.1 Higher education institution	Universitatea Politehnica din Timisoara
1.2 Faculty[2] / Department[3]	
1.3 Chair	—
1.4 Field of study (name/code[4])	Inginerie civilă / 10
1.5 Study cycle	Master
1.6 Study program (name/code/qualification)	Advanced design of steel and composite structures

2. Information about discipline

2.1 Name of discipline/The educational classe[5]	Advanced Finite Element Analysis / DA						
2.2 Coordinator (holder) of course activities	Dogariu Adrian						
2.3 Coordinator (holder) of applied activities[6]	Chesoan Adriana						
2.4 Year of study[7]	I	**2.5** Semester	1	**2.6** Type of evaluation	E	**2.7** Type of discipline[8]	D

3. Total estimated time (direct activities (fully assisted), partially assisted activities and unassisted activities[9])

3.1 Number of hours fully assisted/week	3 ,of which:	**3.2** course	1	**3.3** seminar/laboratory/project	2
3.1* Total number of hours fully assisted/sem.	42 ,of which:	**3.2*** course	14	**3.3*** seminar/laboratory/project	28
3.4 Number of hours partially assisted/week	,of which:	**3.5** project, research		**3.6** training	**3.7** hours designing M.A. dizertation
3.4* Number of hours pasrtially assisted/ semester	,of which:	**3.5*** project of research		**3.6*** training	**3.7*** hours designing M.A. dizertation
3.8 Number of hours of unassisted activities/ week	2,85 ,of which:	Additional documentation in the library, on specialized electronic platforms, and on the field			0,85
		Study using a manual, course materials, bibliography and lecture notes			1
		Preparation of seminars/ laboratories, homework, assignments, portfolios, and essays			1
3.8* Total number of hours of unasssited asctivities/ semester	40 ,of which:	Additional documentation in the library, on specialized electronic platforms, and on the field			12
		Study using a manual, course materials, bibliography and lecture notes			14
		Preparation of seminars/ laboratories, homework, assignments, portfolios, and essays			14
3.9 Total hrs./week[10]	5,85				
3.9* Total hrs./semester	82				
3.10 No. of credits	7				

4. Prerequisites (where applicable)

4.1 Curriculum	•
4.2 Competencies	•

5. Conditions (where applicable)

5.1 of the course	•
5.2 to conduct practical activities	•

6. Specific competencies acquired through this discipline

Specific competencies	•
Professional competencies ascribed to the specific competencies	• Proiectare in construcții cu posibilitatea asumării responsabilității de conducător • Activitate de cercetare, dezvoltare în domeniul structurilor pentru construcții • Consultanta, asistenta tehnică și verificări de proiecte
Transversal competencies ascribed to the specific competencies	•

7. Objectives of the discipline (based on the grid of specific competemcies acquired)

7.1 The general objective of the discipline	• Finite element method is the most advanced tool for research and design. This course continues the class of Introduction in Finite Element analysis and introduces finite element methods for the analysis of strucutres. The main objective of this course is to give students the principles of the finite element method, with a detailed description of each step of the method
7.2 Specific objectives	• The governing continuum mechanics equations, conservation laws, virtual work, and variational principles are used to establish effective finite element discretizations and the stability, accuracy, and convergence are discussed. This course, together with the practical works intend to teach to students in using advanced finite element software, like ABAQUS©, for linear and nonlinear analyses. Applications include finite element analyses, modeling of problems, and interpretation of numerical results. At the end of this course it is expected that students will be able to model and solve complex civil engineering structures

8. Content

8.1 Course	Number of hours	Teaching methods
Review of basic principle of finite element method	2	lecturing, conversation, explication, demonstration
Advanced finite softwares	2	
Creating and analyzing a FE model	1	
Defining geometry	1	
Material and section properties	1	
Assemblies numerical models	1	
Analysis steps	1	
Loads and boudary conditions	1	
Meshing techniques and general rules	2	
Analysis procedures	1	
Validate the results and examples of FE simulations	1	

Bibliography[11] O.C. Zienkiewicz and R. Taylor: The Finite Element Method. Volume 1: Basis. Ed Butterworth-Heinemann, 2000.
C. Pacoste, V. Stoian, D. Dubină: Metode moderne în mecanica structurilor. Ed. Ştiintifică şi Enciclopedică. 1988.
Dassault Systèmes Simulia Corp., Providence, RI, USA: Abaqus 6.14 documentation collection

8.2 Applied activities[12]	Number of hours	Teaching methods
Description of ABAQUS software	10	Explication, example, tutorials
Static analysis of frame structures	2	
Stress concentration analysis using FEA (Kirsh problem)	2	
Static analysis of trusses	2	
Buckling analysis of plated structures	2	
Analysis of RC/masonry structures	2	
Modeling contacts	2	
Modeling foundations	2	
Static nonlinear analysis of frames	4	

Bibliography[13] Dassault Systèmes Simulia Corp., Providence, RI, USA: Abaqus 6.14 documentation collection

9. **Coroboration of the content of the discipline with the expectations of the main representatives of the epistemic community, professional associations and employers in the field afferent to the program**

- Preparing and evaluating students in the fundamental field of computational mechanics of deformable bodies and advanced analysis

10. Evaluation

Type of activity	**10.1** Evaluation criteria[14]	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course	Theoretical subjects from course content	Writen exam	20 %
10.5 Applied activities	**S:**		
	L: Aplication solved within the FE software	Tests, attendance	80 %
	P:		
	Pr:		
	Tc-R[15]:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified[16]			

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[11] At least one title must belong to the department staff teaching the discipline, and at least one title must refer to a relevant work for the discipline, a national and international work that can be found in the UPT Library.
[12] The types of applied activities are those mentioned in 5. If the discipline containes more types of applied activities then they are marked, consecutively, in the table below. The type of activity will be marked distinctively under the form: „Seminar:", „Laboratory:", „Project:" and/or „Practice/Training:".
[13] At least one title must belong to the staff teaching the discipline.
[14] The Syllabus must contain the evaluation method of the discipline, specifying the criteria, the metods şi the forms of evaluation, as well as mentioning the share attached to these within the final mark. The evaluation criteria must correspond to all activities stipulated in the curriculum (course, seminar, laboratory, project), as well as to the methods of continuous assessment (homework, essays etc.)
[15] Tc-R= Homework-Reports

• All subjects should obtain a passing grade mark

Date of completion	**Course coordinator (signature)**	**Coordinator of applied activities (signature)**
06.03.2019		
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Head of Department (signature)	**Date of approval in the Faculty Council** [17]	**Dean (signature)**
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[16] For this point turn to "Ghid de completare a Fişei disciplinei" found at: http://univagora.ro/m/filer_public/2012/10/21/ghid_de_completare_fisa_disciplinei.pdf
[17] The approval is preceeded by discussing the study program's board's point of view with redgards to the syllabus.