Subject Title: Finite Element Methods

Course Basic Information					
Academic Unit:	Faculty of Civil Engineering				
Course Name:	Finite Element Methods				
Level:	Master				
Course Status:	Elective				
Year of Study:	1 st year, I- semester				
Number of Hours per Week:	2+1				
ECTS Credits:	3				
Time /Venue:	According to timetable				
Course Teacher:	Prof. asoc.Dr. Misin Misini				
Contact Details:	e-mail: misin.misi	ni@uni-pr.edu			
Course Description	Basic Concept of FEM, One dimensional problems, Finite				
•	elements for two-di	mensional problems,	Finite elements for		
	three-dimensional	problems, Isopara	ametric elements,		
	Axisymmetric pro	blems, Plate bendin	g elements, Finite		
	Element Application	ons to Structural Dyr	namics, Non Linear		
	Solid mechanics, So	oftware application.			
Course Objectives:	Getting familiar wi	th the basics of FEM	and its application		
	in solving engineer	ing problems.	11.1 C 11 4		
Learning Outcomes:	On completion of the	11s course the student	s will be familiar to		
	the concept of FEN	rel enclusio	ise of finite element		
	software for structu	ital allalysis.			
Student Workloa	Student Workload (Consistent with the Learning Outcomes)				
		ne Learning Outcome	201		
Activity	Hours	Day/ Week	es) Total		
Activity Lectures	Hours 2	Day/ Week 15	es) Total 30		
Activity Lectures Theory/ Lab Work	Hours 2 1	Day/ Week 15 15	es) Total 30 15		
Activity Lectures Theory/ Lab Work Practical Work	Hours 2 1	Day/ Week 15 15	es) Total 30 15		
Activity Lectures Theory/ Lab Work Practical Work Contact Hours with Teacher	Hours 2 1	Day/ Week 15 15 15	es) Total 30 15 6		
Activity Lectures Theory/ Lab Work Practical Work Contact Hours with Teacher /Consultations during Office Hours	Hours 2 1 0.5	Day/ Week 15 15 12	es) Total 30 15 6		
Activity Lectures Theory/ Lab Work Practical Work Contact Hours with Teacher /Consultations during Office Hours Field Work	Hours 2 1 0.5	Day/ Week 15 15 15 12	es) Total 30 15 6		
Activity Lectures Theory/ Lab Work Practical Work Contact Hours with Teacher /Consultations during Office Hours Field Work Colloquium, Seminars	Hours 2 1 0.5 2	Day/ Week 15 15 12 2	es) Total 30 15 6 4		
Activity Lectures Theory/ Lab Work Practical Work Contact Hours with Teacher /Consultations during Office Hours Field Work Colloquium, Seminars Homework	Hours 2 1 0.5 2 1	Day/ Week 15 15 12 2 5	es) Total 30 15 6 4 5		
Activity Lectures Theory/ Lab Work Practical Work Contact Hours with Teacher /Consultations during Office Hours Field Work Colloquium, Seminars Homework Self-study Time	Hours 2 1 0.5 2 1	Learning Outcome Day/ Week 15 15 12 2 5 5	es) Total 30 15 6 4 5 5		
Activity Lectures Theory/ Lab Work Practical Work Contact Hours with Teacher /Consultations during Office Hours Field Work Colloquium, Seminars Homework Self-study Time (in the Library or at Home)	Hours 2 1 0.5 2 1 1	Learning Outcome Day/ Week 15 15 12 12 2 5 5 5	es) Total 30 15 6 4 5 5 5		
Activity Lectures Theory/ Lab Work Practical Work Contact Hours with Teacher /Consultations during Office Hours Field Work Colloquium, Seminars Homework Self-study Time (in the Library or at Home) Final Exam Preparation	Hours 2 1 0.5 2 1 2 1 2 1 2 1 2 1 2 1 2	Learning Outcome Day/ Week 15 15 12 2 5 5 5	es) Total 30 15 6 4 5 5 10		
Activity Lectures Theory/ Lab Work Practical Work Contact Hours with Teacher /Consultations during Office Hours Field Work Colloquium, Seminars Homework Self-study Time (in the Library or at Home) Final Exam Preparation Evaluations (Tests, Quiz, Final exam)	Hours 2 1 0.5 2 1 2 1 2 1 2 2 1 2 1 2	Learning Outcome Day/ Week 15 15 12 2 5 5 5	es) Total 30 15 6 4 5 5 10		
Activity Lectures Theory/ Lab Work Practical Work Contact Hours with Teacher /Consultations during Office Hours Field Work Colloquium, Seminars Homework Self-study Time (in the Library or at Home) Final Exam Preparation Evaluations (Tests, Quiz, Final exam) Projects, Presentations, etc.	Hours 2 1 0.5 2 1 2 1 2 1 2 1 2	Learning Outcome Day/ Week 15 15 12 12 2 5 5 5 5	es) Total 30 15 6 4 5 5 10 10		
Activity Lectures Theory/ Lab Work Practical Work Contact Hours with Teacher /Consultations during Office Hours Field Work Colloquium, Seminars Homework Self-study Time (in the Library or at Home) Final Exam Preparation Evaluations (Tests, Quiz, Final exam) Projects, Presentations, etc. Total	Hours 2 1 0.5 2 1 2 1 2 1 2 1 2	Learning Outcome Day/ Week 15 15 12 2 5 5 5 5	es) Total 30 15 6 4 5 5 5 10 75		
Activity Lectures Theory/ Lab Work Practical Work Contact Hours with Teacher /Consultations during Office Hours Field Work Colloquium, Seminars Homework Self-study Time (in the Library or at Home) Final Exam Preparation Evaluations (Tests, Quiz, Final exam) Projects, Presentations, etc. Total	Hours 2 1 0.5 2 1 2 1 2 1 2 1 2	Learning Outcome Day/ Week 15 15 12 2 5 5 5 5	es) Total 30 15 6 4 5 5 5 10 75 75		
Activity Lectures Theory/ Lab Work Practical Work Contact Hours with Teacher /Consultations during Office Hours Field Work Colloquium, Seminars Homework Self-study Time (in the Library or at Home) Final Exam Preparation Evaluations (Tests, Quiz, Final exam) Projects, Presentations, etc. Total Teaching Methodology: Evaluation Methodology:	Hours 2 1 0.5 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 1 2 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 1 2 1 1 2 1 2 1 2 1 2 2 <td>Learning Outcome Day/ Week 15 15 12 2 5 5 5 5 5</td> <td>es) Total 30 15 6 4 5 5 10 75 25%</td>	Learning Outcome Day/ Week 15 15 12 2 5 5 5 5 5	es) Total 30 15 6 4 5 5 10 75 25%		
Activity Lectures Theory/ Lab Work Practical Work Contact Hours with Teacher /Consultations during Office Hours Field Work Colloquium, Seminars Homework Self-study Time (in the Library or at Home) Final Exam Preparation Evaluations (Tests, Quiz, Final exam) Projects, Presentations, etc. Total Teaching Methodology: Evaluation Methods:	Hours 2 1 0.5 2 1 2 1 2 1 2 1 2 1 2 4 1 2 4 1 2 4 1 2 4 1 2 4 1 2 4 1 2 4 1 2 4 1 1 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Learning Outcome Day/ Week 15 15 12 2 5 5 5 5 5 5 5 5 5 5 5	es) Total 30 15 6 4 5 5 10 75 75 At an a second		
ActivityLecturesTheory/ Lab WorkPractical WorkContact Hours with Teacher/Consultations during Office HoursField WorkColloquium, SeminarsHomeworkSelf-study Time(in the Library or at Home)Final Exam PreparationEvaluations (Tests, Quiz, Final exam)Projects, Presentations, etc.TotalTeaching Methodology:Evaluation Methods:	Hours 2 1 0.5 2 1 2 1 2 1 2 1 2 1 2 Attendance 5%; First Individual work 10%, Final exam (oral) 30%	Learning Outcome Day/ Week 15 15 12 2 5 5 5 5 5 5 5 5 5	Total 30 15 6 4 5 5 10 75 nd Evaluation 25%;		

Basic Literature:	 [1] M. Misini.: MEF, leksione të shkruara, UP, FNA, Prishtinë 2014, [2] C. A. Felippa: Introduction To Finite Element Methods (IFEM), ASEN 5007, Colorado, 2004
Additional Literature:	 [3] M. Stavileci, N. Pojani: Metoda e elementëve të fundëm në Mekanikën e Strukturave, Prishtinë, 2006 [4] Zienkiewiecz O.: The Finite Element Methods, McGraw-Hill, New York, 1987 [5] Cook, Robert Davisetal, Concepts and Applications of Finite Element Analysis, Wiley, John & Sons, 1999

Course Plan:		
Week	Title of the Lecture	
Week 1:	FEM Modeling Introduction, FEM Terminology, Continuum elements, Special elements, Macro elements,	
Week 2:	Classification of Mechanical Finite Elements	
Week 3:	Primitive Structural Elements The Direct Stiffness Method	
Week 4:	Principle of minimum potential energy, Variation principle	
Week 5:	One dimensional problems, Local and global coordinate systems, Shape functions, Bar and beam element	
Week 6:	Discretization into Plane stress Finite Elements	
Week 7:	Interpolation Function	
Week 8:	Isoparametric representation by Finite elements	
Week 9:	Solid elements	
Week 10:	Axisymmetric solid	
Week 11:	Rectangular plate bending elements, Triangular plate bending elements, General plate and shell elements	
Week 12:	FEM Convergence requirements	
Week 13:	Non Linear Solid mechanics, Geometric nonlinearity, Material nonlinearity	
Week 14:	FEM in Structural Dynamics	
Week 15:	Software application	

Academic Policies and Rules of Civility:

Regular attendance of lectures and exercises Mobile phones need to be switched off during class. Attending the class in time.