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:	**1st 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.misini@uni-pr.edu**
Course Description	Basic Concept of FEM, One dimensional problems, Finite elements for two-dimensional problems, Finite elements for three-dimensional problems, Isoparametric elements, Axisymmetric problems, Plate bending elements, Finite Element Applications to Structural Dynamics, Non Linear Solid mechanics, Software application.
Course Objectives:	Getting familiar with the basics of FEM and its application in solving engineering problems.
Learning Outcomes:	On completion of this course the students will be familiar to the concept of FEM. To encourage the use of finite element software for structural analysis.

Student Workload (Consistent with the Learning Outcomes)			
Activity	**Hours**	**Day/ Week**	**Total**
Lectures	2	15	30
Theory/ Lab Work	1	15	15
Practical Work			
Contact Hours with Teacher /Consultations during Office Hours	0.5	12	6
Field Work			
Colloquium, Seminars	2	2	4
Homework	1	5	5
Self-study Time (in the Library or at Home)	1	5	5
Final Exam Preparation	2	5	10
Evaluations (Tests, Quiz, Final exam)			
Projects, Presentations, etc.			
Total			**75**

Teaching Methodology:	*Lectures + Exercises*
Evaluation Methods:	Attendance 5%; First Evaluation 30%; Second Evaluation 25%; Individual work 10%, Final exam (oral) 30%.
Literature	

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.*