Course Unit Descriptor

Study Programme: Civil Engineering

Course Unit Title: Finite Element Method

Course Unit Code: GG515

Name of Lecturer(s): Kovačević Dušan

Type and Level of Studies: master

Course Status (compulsory/elective): elective

Semester (winter/ summer): summer

Language of instruction: english

Mode of course unit delivery (face-to-face/distance learning): face-to-face

Number of ECTS Allocated: 5

Prerequisites: none

Course Aims:.

Obtaining advanced knowledge in the field of numerical modelling of structure behaviour for diverse actions by applying the Finite Element Method (FEM) and the application of adequate computer software for FEM structure analysis.

Learning Outcomes:
Enabling competence in the field of numerical modelling of structure behavior for various actions by applying the finite element method (FEM) and the application of computer software for FEM structure analysis.

Syllabus.
Basic concept of structure modelling. Continual and discrete calculation models. Historical development and interpretation of the finite element method (FEM). Various forms of FEM. Matrix formulation of basic equations of the theory of elasticity. Variational formulation of FEM. General theory of FEM: element analysis, transformation of the element stiffness matrix, formation of the system stiffness matrix, boundary conditions, solution of system of equations, calculation result interpretation. Direct method. Residuum method. Finite elements and interpolation functions: line, triangular and rectangular elements. Numerical integration. Computer implementation of the FEM application in stress-strain analysis and calculations on real engineering structures.

Required Reading:
Relevant literature in English, tbd

Weekly Contact Hours:2	**Lectures: 2**	**Practical work: 2**

Teaching Methods:
Interactive work with students in order to continually monitor their knowledge level. Theoretic analysis on the phenomena included in the course content and FEM numerical structure modelling for diverse actions by applying CASA (Computer Aided Structural Analysis) computer software.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Attendance			
Computer exercises			
Tests (4x)			