

Incoming student mobility

Name of UNIOS University Unit: Mechanical Engineering Faculty in Slavonski Brod

COURSES OFFERED IN FOREIGN LANGUAGE FOR ERASMUS+ INDIVIDUAL INCOMING STUDENTS

Department or Chair within the UNIOS Unit	Department of Mechanical Constructions
Study program	Mechanical Engineering
Study level	Graduate (master)
Course title	Finite Element Method
Course code (if any)	P 705
Language of instruction	English
Brief course description	Generally about finite element method. Basic finite elements and applications possibilities. Variational formulation of the finite element method. The definition of the stiffness matrix. Method of displacement formulation. Basic equation of finite element method. Loading and boundary conditions. Global formulation of finite element method. Convergence of the solutions. One-dimensional finite elements: basic truss and basic beam element. Finite element for two-dimensional analysis: basic triangle and quadrilateral element. Lagrange interpolation polynom. Serendipity element. Finite element for 3D analysis: tetrahedral and prismatic elements. Axisymmetric elements. Isoparametric finite elements. Numerical integration. Finite elements for the solving of plate bending problems. Finite elements for shelllike- structures analysis. Examples of solved problems by using of finite element software as ANSYS. The advantages of the numerical modelling related to classical analytical methods will be emphasized. The efficiency and the accuracy of the analysis performed by finite elements will be discussed through several numerical examples.
Form of teaching	Lectures and exercises. The procedure of global stiffness matrix derivation for some simple solid mechanics problems will be described. Solving of some example by using of truss and beam elements, analytically and numerically. Examples of solving the problems by using of plane and axisymmetric elements. CAD-FEM interaction, structure discretisation, boundary conditions setting and analysis of results in commercial software for FEA such as ANSYS and ABAQUS.

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Form of assessment	5 seminar works during the semester replace the written part of exam. For oral part of the exam it is necessary to show good knowledge of theoretical background of finite element method.
Number of ECTS	5
Class hours per week	2 hours of lectures + 2 hours of exercises
Minimum number of students	10
Period of realization	Summer semester
Lecturer	Full Prof. Dr. Dražan Kozak