UNIVERSITY of DEBRECEN

PEKÁR IMRE
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Name of the course:	Numerical Mechanics
Course type:	Optional
Responsible lecturer:	Dr. Tamás Mankovits
Content:	The aim of the course is to impart higher-level theoretical and practical knowledge of the finite element method suitable for approximate calculations of mechanical structures. Historical overview of the concept, significance, and development of the finite element method. Fields of application of the finite element method, available software. Basic knowledge of elasticity. Displacement based Finite Element Method. The process of finite element modelling, covering the decision, preparation, solution and evaluation stages. Geometric models and their establishment, geometric simplifications, application of boundary conditions, application of 2D and 3D models. Mesh creation steps, stress analysis elements, element size, local mesh refinement, structured mesh creation, meshing errors. Material models. Loads, boundary conditions. Connections between components (frictionless and frictional contact, glued connections). Error analysis. Programming possibilities of finite element program systems.
Literature:	• Mankovits T.: Numerical Analysis of Engineering Structures (Linear Elasticity and the Finite Element Method), University of Debrecen, Debrecen, 2014. • Zienkiewicz, O.C., Taylor, R.L.: The Finite Element Method: Solid Mechanics, Butterworth-Heinemann, London, England, ISBN: 0750650559, p. 477., 2000. • Kovács, Á., Moharos, I., Oldal, I., Szekrényes, A.: Finite Element Method, Typotex, Budapest, Hungary, p. 383. ,2012. • Bathe K.J.: Finite Element Procedures, Prentice Hall, New Jersey, 1996.