

<b>Course title: Programming of CAD and FEM systems</b>	<b>Neptun code: GEGET417-a</b>
<b>Course coordinator:</b> Ferenc János Szabó, associate professor, PhD	
type and number of lesson: <u>28 (14 x 2 lectures/week)</u>	
method of accountability: <u>colloquium</u>	
curriculum location of the subject: <u>spring</u>	
pre-study conditions: No	
<b>The task and purpose of the subject:</b>	
Study of a Finite Element program system, in order to be able to build a program of a 3D model in an integrated CAD-FEM software, solve it and optimize it if possible.	
<b>Course description:</b>	
Overview of programming possibilities of several finite element program systems available in the market. Optimization algorithms, programming of optimization problems, solving them. Connecting optimization with FEM. Building an optimization program for a 3D model and solution of the optimization problem. Demonstration of results and publications of the department on the optimization of machine structures and elements, multidisciplinary optimizations.	
<b>Required literature:</b>	
<ol style="list-style-type: none"> <li>1. <b>Kirsch, U.:</b> Optimum Structural Design. McGraw- Hill, New York, 1981.</li> <li>2. <b>Wilde, D.J. - Beightler, C.S.:</b> Foundations of Optimization. Prentice- Hall inc., Englewood Cliffs, 1967.</li> <li>3. <b>Goldberg, D.E.:</b> Genetic Algorithms in Search, Optimization an Machine Learning. Addison- Wesley, Massachusetts, 1989.</li> </ol>	
<b>Recommended literature:</b>	
<ol style="list-style-type: none"> <li>1. <b>SRAC:</b> OSMOS/M User's Guide, Santa Monica, CA, USA, 1995.</li> <li>2. <b>SDRC:</b> I-DEAS User's Guide, Milford, OH, USA, 1993.</li> <li>3. <b>Singeresu S Rao:</b> Engineering Optimization. Theory and Practice. John Wiley and Sons, USA, 2009.</li> </ol>	