



**T-844-FEMM**

**FINITE ELEMENT ANALYSIS IN ENGINEERING**

**8 ECTS**

<b>Year of study:</b>	3 <sup>rd</sup> or 4 <sup>th</sup> year (final year BSc og first year MSc).
<b>Semester:</b>	Spring.
<b>Level of course:</b>	3. First cycle, advanced / 4. Second cycle, introductory.
<b>Type of course:</b>	Elective. <i>Recommended elective for MSc Mechanical Engineering.</i>
<b>Prerequisites:</b>	Statics and Mechanics of Materials (T-106-BURD), Dynamics (T-534-AFLF).
<b>Schedule:</b>	Runs for 12 weeks – 6 teaching hours a week.
<b>Supervisor:</b>	Jónas Þór Snæbjörnsson.
<b>Lecturer:</b>	Jónas Þór Snæbjörnsson.

**Learning outcome:** On completion of the course the students should be:

- Familiar with the FE method and common FE tools and approaches used for problem solving in mechanics,
- able to build up the stiffness matrices for common element types and to construct the system matrices for the structure,
- able to define the proper boundary conditions and solve the relevant systems of equations,
- able to evaluate errors and deviations in FEM analyses.
- able to build FE models for analysis of problems in mechanics using commercial FE software,
- able to present the result of a FE analysis in a clear and concise manner

**Content:** The course will present the main features and possibilities of the finite element method (FEM) and its application in analysis of problems in mechanics. Aspects of the finite element method, from the mathematical background through to practical implementation and application are discussed. Emphasis is placed on possible errors and how to minimize them. Students will develop an understanding of the fundamentals of the finite element method and get some training in the use of commercial finite element software. Simple analysis will be done in Matlab, as well as more complex analyses in larger FEM software (such as SAP2000, ANSYS, a.o.).

<b>Reading material:</b>	To be announced.
<b>Teaching methods:</b>	Lectures and project work.
<b>Assessment methods:</b>	Initial introduction task (2%); Individual Assignments (59%); Group Assignments (39%).
<b>Language of instruction:</b>	English.

**All course descriptions may be subject to change.** Revised information on the course schedule, reading material, teaching and learning activities, and assessment methods will be introduced in the learning management system Canvas at the beginning of the semester.