Module Description Finite Element Analysis (FEA)

Name of module:	Finite Element Analysis (FEA)
Keywords:	Finite Element Method, ANSYS
Module number:	Not compulsory
Target groups:	3- 7 semester exchange students
ECTS Credits:	4
Language of instructions:	English
Module owner:	Prof. Dr.-Ing. Carsten Block
Last update	17 January 2023

Extent of work (hours)

Workload	Contact hours	Self-Study	Exam Preparation
80	40	20	20

Prerequisites:	Basic courses in engineering mechanics and mathematics
Total target:	• Formulate, analyse, and verify mechanical system analysis problems using an industry standard finite element analysis (FEA) software • Understand the structure and operation of a commercial FEA program (ANSYS) • Analyse deformations, forces, strains and stresses under a variety of loading conditions, including static and dynamic load cases
Module contents:	• Introduction to finite element analysis and ANSYS • Data transfer from CAD to FEA • Modelling, meshing, applying loads and boundary conditions • Determination of displacements and stresses in beams, trusses and three-dimensional bodies • Validation and Verification in FEA Laboratory Work • Introduction to ANSYS Workbench • Application to example problems (beams, trusses, three-dimensional bodies) Group Project • Use of FEA to solve an engineering problem • Documentation in a professional engineering report
Reference material:	Lecture notes
Offered:	Winter semester
Relevance for other study programmes:	Mechatronics

Submodules and assessments

Type of instruction/ form of learning:	Lectures, practices and project work
Duration:	12 weeks: September/October – December
Hours per week:	4
Aims, learning outcomes:	See above
Estimated student workload:	40
Type of Assessment:	in-class exercises; project work, graded
Number of participants:	**Due to the limited number of participants, please register in advance by email to:** kremena.daneva@hs-esslingen.de

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