1	Course Number	Study Programme	Semester	Offered in	Duration	Course Type	Workload (h)	ECTS Points
		INTAP	3-7	☒WS	1 Semester	optional		4

2	Courses	Teaching and Learning Forms	Contact Time (SWS)	Contact Time (h)	Self-Study Time (h)	Language
		Lectures, practices and project work	4 (1h=45 min.)	**40**	20	English

3 **Learning outcomes and competences**

After successfully completing the module, students will be able to ...

- Formulate, analyze, 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)
- Analyze deformations, forces, strains and stresses under a variety of loading conditions, including static and dynamic load cases

4 **Course 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

5 **Participation Requirements**

- Basic courses in engineering mechanics and mathematics

6 **Examination Forms and Prerequisites for Awarding ECTS Points**

in-class exercises; project work, graded

7 **Estimated student workload**

40 hours

8 **Further Use of course**

Electrical Engineering, Mechatronics

9 **Course Manager and Full-Time Lecturer**

Prof. Dr. Carsten Block

10 **Literature**

Lecture notes

11 **Course Registration**

Due to the limited number of participants, we ask that you register in advance by emailing kremena.daneva@hs-esslingen.de.

You may only participate after receiving confirmation of your registration.

12 **Last Updated**

30.04.2026