MICRO-628

Introduction to Finite Element Modelling in Microsystems

Quack Niels

Cursus	Sem.	Type
Microsystems and Microelectronics		Obl.

Language of teaching	English
Credits	1
Session	
Exam	Oral presentation
Workload	30h
Hours	**21**
Lecture	7
Exercises	7
Practical work	7
Number of positions	**30**

Frequency

Every year

Remark

Postponed to Spring 2021

Summary

Introduction to Finite Element Modelling with hands-on examples of typical microsystems.

Content

The following topics are introduced and hands-on finite modeling is performed using COMSOL Multiphysics for typical microsystems.

Introduction to FEM: Material Models, Anisotropy, Convergence, Nonlinearity, Mesh, Study Types
Structural Mechanics: Modal Analysis, Thin Films, Stress, Curvature
Thermal FEM
Electro-Thermo-Mechanical Coupling
Electrostatic FEM: Fields, Boundary Conditions, Parallel Plate Actuator, Voltage-Displacement
Introduction to Damping Effects and Microfluidics

After the lectures and exercices, the student will develop an own finite element model and present the results.

Keywords

MEMS, Finite Element Modeling FEM

Learning Outcomes

By the end of the course, the student must be able to:

- Perform a finite simulation of a typical microsystem
- Present and discuss the obtained solutions