Course Offered in Spring 2019

ECE 6030: Micro-Electro-Mechanical Systems (MEMS) Design

Want to learn how to design accelerometers, gyroscopes, pressure sensors, resonators, cantilever-based sensors, RF switches, micro-mirrors? New project-driven graduate course.

Course Topics

- History of MEMS and commercial examples
- Miniaturization: law of scaling
- Structural mechanics, elasticity, mechanical properties of silicon, and dynamic response
- Beam theory, cantilevers, doubly clamped beams, comb-drive actuators
- Lumped modeling
- MEMS fabrication techniques
- Multiphysics modeling using COMSOL
- Case studies: Inertial, optical, RF, and power devices
- Project presentations

Description:

The field of micro-electro-mechanical systems (MEMS) is an interdisciplinary area that includes design and fabrication of sensors and actuators (transducers) that are capable of micron-size mechanical movements. Lectures cover a wide range of topics in design & fabrication. Projects include FE simulation of an inertial, optical, RF, or power MEMS devices as an integral part of this course.

Grading:

- Homework assignments - 25%
- Midterm - 30%
- Design project, report, and presentation - 45%

Prerequisites: Graduate standing in engineering or physics

Questions? Contact:
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More info at: go.osu.edu/MEMS