ME/MS 778 **Micromachined Transducers** **Fall 2009**

Instructor
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Lectures: Tue, Thu 4-6 PM; MFG Rm. 105
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2008-2009 Catalog Data:

ME/MS 778 Micromachined Transducers
The fields of microelectromechanical devices and systems ("MEMS") and NEMS have been growing at an exciting pace in recent years. The interdisciplinary nature of both micromachining techniques and their applications can and does lead to exciting synergies. This course will explore the world of mostly silicon-based micromachined transducers, i.e., microsensors and microactuators. This requires an awareness of material properties, fabrication technologies, basic structural mechanics, sensing and actuation principles, circuit and system issues, packaging, calibration, and test. We will go over this through a combination of lectures, case studies, individual homework assignments, and design projects carried out either individually or in teams.

Course Schedule: 4 lec hr/wk

Status in the Curriculum: Graduate Students

Required Textbook(s): None, course materials will be provided during the class.

Major References:
- Stephen Senturia, *Microsystem Design*, Kluwer, 2001.
- Marc Madou, *Fundamentals of Microfabrication*, 2nd Edition, CRC, 2002.
- Gregory Kovacs, *Micromachined Transducers Sourcebook*, McGraw-Hill, 1998.

Additional resources required (specify): None

Coordinator: Xin Zhang, Associate Professor of Mechanical Engineering

Prerequisites by topic: ME/MS 555 or equivalent

Goals: To provide a broad introduction to state-of-the-art microsensors and microactuators with sufficient coverage of design, fabrication, characterization, and operation of MEMS-based structures and devices.

Computer Usage: PPT for project presentation

Contribution of Course to Meeting the Professional Component:
Engineering topics: 100%

Grading: Based on performance on various sections including "Ideas", "Background Study", "Subject Study", "Group Study", "Homework Assignments", "Midterms" and "Finals".