

EE185: MEMS/NEMS Technology and Devices (3-0-6)

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Overview of the Course:

This is a senior/1st-year graduate course on fundamental MEMS technology and devices (including silicon techniques). Topics will first emphasize the fundamental technologies such as “bulk” micromachining, “surface” micromachining, LIGA, bonding/sealing, packaging and even nanotechnology. Various MEMS and NEMS devices (such as Optical MEMS, RF MEMS, Bio MEMS, and lab-on-a-chip) and some fundamental MEMS theories will also be covered.

Textbook: None

Class notes and recent publications

Homework:

There will be roughly 5 homeworks for the term. Homework solutions will be available after your homeworks are graded. Late homeworks will have no credit except for medical reasons. *Note that in this course, no collaboration on homeworks is allowed.*

Term Paper:

There will be **no midterm** for this course, but there be a final paper plus a 10-minute in-class presentation for the final. You can pick your own topic but it has to be approved by the instructor/TA in advance. If you need help, there will be a list of suggested topics for your reference. The term paper is limited to 3-5 pages of single-spaced text. There's no limit on figures or exhibits. The grading on the term paper depends on its originality, creativity, depth and level of work, etc.

In-class Presentation:

There will be no final written exam. Instead, a 10 minute presentation based on your final-paper to the whole class is required. Grading on your presentation will depend on your effort and materials, not English.

Grading:

Note that graduate and undergraduate students will be graded separately (no competition between the two groups), and the final scores depend on:

Homework	50%
Final Paper	30%
Presentation	20%

TAs: TBA

Other Reference Books

1. S. Wolf and R.N. Tauber, "Silicon Processing" Vol. 1, 2 and 3, Lattice Press.
2. M. Madou, "Fundamentals of Microfabrication"
3. S.M. Sze, "Semiconductor Sensors"
4. Kovacs, "Micromachined Transducer Sourcebook"