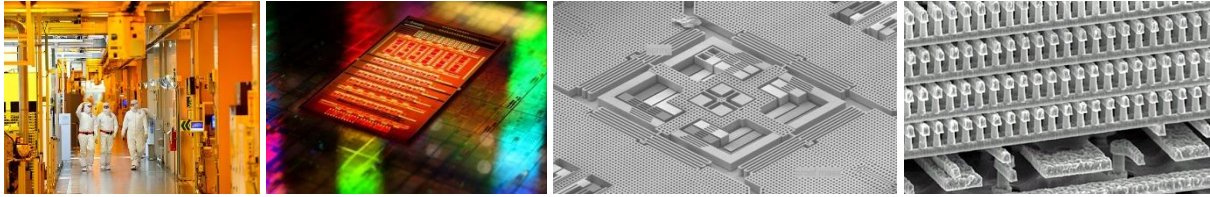


## EE 527 Micro/Nano Fabrication (Spring 2021)



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<b>Lectures:</b>	-	<b>Room</b>	Fluke Hall 119A

### **Synopsis**

The success of microelectronics industry and the prospect nanotechnology and quantum technology all have benefited and rely on the advancement fabrication technology and tools. Although modern tools are highly automatic, understanding the behind-the-scene working principles is critical to your research and innovation of the next-generation technology. Research in university labs also requires the fundamentals for customization and maintenance of the tools and development of process for fabricating novel devices involve unconventional materials.

This course will provide a comprehensive introduction to micro/nano fabrication technology with a focus on the university research setting. The lectures will be coupled with laboratory sessions for first-hand training and experience in WNF's clean room. (Note: During COVID-19, the lab session will be in remote mode through live streaming.)

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### Lecture Topics

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#### Overview

*Historical facts, Moore's law, micro- and nano-technology*

#### Hot Process

*Diffusion, Ion implantation, thermal oxidation, annealing, rapid thermal process*

#### Pattern generation and transfer

*Optical lithography, electron beam lithography, photoresist, novel lithography methods, plasma process, dry and wet etching*

#### Thin film deposition

*Physical vapor deposition, chemical vapor deposition, atomic layer deposition, epitaxial growth*

#### Process integration

*MEMS, system in package, wafer scale integration, optoelectronics, multi-project wafer*

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### **Textbook**

Campbell, S. (2012). Fabrication Engineering at the Micro- and Nanoscale Oxford University Press, 3rd Edition. Online Access through UW Library.

### **Grading (Tentative)**

Homework: 50%                      Final: 25%                      Lab: 25%