EEC249 – Nanofabrication
3 units – Winter Quarter 2019

Objective: The objective of this course is to discuss the theory and practices of nanofabrication, used for producing integrated circuits, electronic devices, sensors, and microstructures. Process development and characterization will be also covered.

Lecture & Discussion: 3 hours

Class Times/Location: Tuesday and Thursday 12:10PM-1:30PM Hart 1116

Prerequisite: Graduate Standing (or instructor approval)

Instructor: Prof. Erkin Şeker (eseker@ucdavis.edu); Office: 3177 Kemper Hall; Office Hours: Friday 3-4:30PM

TA: TBA

Grading: Letter; final grade will be based on homework assignments (30%), a midterm exam (25%), a final project report (30%), and in-class presentations (15%).

Homework: There will be 6-7 homework sets which will be assigned a week before they are due.

Midterm Exam: In-class exam will cover the topics up to the midterm. A make-up exam will not be given unless cases of extreme extenuating circumstances arise.

Final Project: Students will be asked to propose a platform that utilizes microfabrication and unique nano-scale phenomenon for addressing a technological need or a scientific question. The project report will be formatted to serve as a foundation for pre-doctoral fellowship applications, thereby training students on essential proposal writing skills.

Presentations: Students will be asked to present their final project and are required to attend both presentation sessions.

Computer Use: ImageJ (NIH free image processing software) will be used for some homework assignments. Specific instructions will be given.

Textbooks: Relevant reading material and exercises will be provided by the instructor.

Attendance & Late Submission Policy: Assignments submitted after deadline up to 24 hours will have 20% deducted; between 24 hours and 48 will have an additional 20% deducted. Any submission later than 48 hours will not be accepted. All homework transactions will be done via Canvas. Attendance during the two lectures (Project Presentations) is mandatory.

Academic Integrity: Cheating and plagiarism will absolutely not be tolerated. Professional integrity is an important aspect of all engineering disciplines and understanding the material in these courses is integral to becoming a proficient and productive engineer. As such, it is imperative that you spend the time and effort to fully understand the material, and seek help when necessary. Please read the UC Davis "Code of Academic Conduct" at participate.ucdavis.edu .

Approximate Timeline

Week	Date	Day	Topic
1	1/8	T	Introduction & course outline
	1/10	H	MOSFET & MEMS process review
2	1/15	T	Pattern transfer
	1/17	H	Vacuum science & plasma
3	1/22	T	Additive processes (physical)
	1/24	H	Additive processes (chemical)
4	1/29	T	Additive processes (chemical)
	1/31	H	Subtractive processes
5	2/5	T	Surface science & intermolecular forces
	2/7	H	Supported nanostructures
6	2/12	T	Unsupported nanostructures
	2/14	H	Materials & process integration
7	2/19	T	Anatomy of a grant proposal
	2/21	H	***No Class***
8	2/26	T	***Midterm***
	2/28	H	Analysis
9	3/5	T	Project Presentations
	3/7	H	Project Presentations
10	3/12	T	Applications & limits
	3/14	H	***No Class***