Microfabrication in optoelectronics (Opti-677)

Instructor: Mahmoud Fallahi

2 credit course

This course is intended to give a broad understanding of various microfabrication techniques used in photonic and optoelectronic components. It covers epitaxial growth, lithography and processing steps of compound semiconductors frequently used in micro/nano-fabrication of optical and optoelectronic devices. Fabrication of waveguides and laser diodes and various integration techniques are also discussed. The following topics are covered.

1. Introduction to Microfabrication
   - Clean room and its operation
   - Sources of Contamination
2. Lithography
   - Photolithography
   - Resist processing
   - Exposure
   - Lift-off process
3. Growth techniques:
   - MBE
   - MOCVD
   - CBE
4. Metallization
   - Ohmic contact
   - Schottky contacts
   - Annealing
5. Etching techniques
   - Wet etching
   - Dry etching
   - What to choose
6. Holography, EBL, FIB
7. Passivation and packaging
8. Optoelectronic Fabrication
   - Waveguides
   - Laser diodes
   - OEIC
9. Integration Techniques

Microfabrication in Optoelectronics

Opti-677;

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Reference Books

Technology of Quantum Devices: Manijeh Razeghi
Handbook of Compound Semiconductors: Holloway & McGuire
Semiconductor Lithography : Moreau

Course Grading

Classroom Attendance/ Discussion	20%
Exam	40%
Project 2	40%