

1. Know the different types of etching systems and the advantages and disadvantages of each. This includes both wet (KOH, HF, BOE, HNA, etc) and dry etching systems (RIE, plasma, DRIE, reverse sputtering, etc). Be prepared to explain which method you would use to etch common MEMS materials (such as silicon, silicon dioxide, and silicon nitride) and why.
2. Know the important issues related to etching such as what determines: etch rate, anisotropy, selectivity, and surface finish. Understand the different types of etch stops.
3. Know the different types of thin film deposition systems (CVD, oxidation, diffusion, sputtering, evaporation, etc.) and the advantages and disadvantages of each. Be prepared to explain which method you would use to deposit or grow common MEMS materials and why.
4. Know the basic issues and fundamentals associated with X-ray Lithography including: absorber, mask membrane, top, bottom, and critical doses, synchrotron radiation, etc.
5. Understand the steps in the LIGA process and what processes can be used in each step
6. Understand the basics of electrodeposition and electroforming. Know what types of materials can be deposited and what effects the quality of the deposited material.
7. Know the basic nontraditional micromachining processes and their strengths and weaknesses related to each other and standard lithography processes.
8. Know the basics of soft lithography and the different types of soft lithography. Know the advantages and disadvantages of the method
9. Know how to mold polymers on the microscale using methods such as injection molding and hot embossing.
10. Know the methods for wafer bonding and the advantages and disadvantages of each. Know why we do wafer bonding.
11. Be ready to examine the issues related to packaging and how they are important to MEMS. Understand the basic examples given in class.
12. Know the basic methods for integrating MEMS with ICs.
13. Know the basic MEMS metrology systems and which one to use for specific applications.
14. Be prepared to complete or explain a microfabrication process diagram, or how you might go about some microfabrication activity using the methods that have already been discussed in class.

Review pages 1-404 in the class textbook or equivalent info in other texts.