

Text Books:

“Fundamentals of Microfabrication: The Science of Miniaturization, Second Edition” by M. Madou, CRC Press, 2002.

References:

“An Introduction to Microelectromechanical Systems Engineering,” 2nd Edition by N. Maluf and K. Williams, Artech House Inc., 2004.

“Silicon Processing for the VLSI Era – Volume 1 Process Technology,” by S. Wolf and R.N. Tauber, Lattice Press, 2002.

“The Science and Engineering of Microelectronic Fabrication,” by S. A. Campbell, Oxford, 2001 (2nd Edition)

Lecture Time: MW 3:05am – 3:55am

Place: MRDC II Room 183

Lab: Wed, Th or Fri 9:05am – 11:55am

Place: Love Building, ME Clean Room, Room 321.

Or Marcus Technology Building Room.....

Instructors:

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Grading: Homework: 10%
Exam I: 25%, Exam II: 25%,
Lab: 30%
Term Paper: 10%

Honor Code: <http://www.honor.gatech.edu>

		FALL 2009		
		ME 6229 Introduction to MEMS	Madou	Homework
Date	Lecture	Topic	Book	Project
8/17/2009	1	Introduction and scaling laws	9	
8/19/2009	2	Introduction to lithography	1	
8/24/2009	3	Mask aligner and imaging optics	1	
8/26/2009	4	Resolution in photolithography and mask layout	1	A1
8/31/2009	5	Structure of silicon and properties		
9/2/2009	6	Oxidation and diffusion	4	D1,A2
9/7/2009		Labor day	3	
9/9/2009	7	Nucelation and growth	3, 5	D2,A3
9/14/2009	8	Evaporation	3	
9/16/2009	9	Sputtering	3	D3, A4
9/21/2009	10	CVD	3	
9/23/2009	11	PECVD	3	D4, A5
9/28/2009	12	Atomic Layer Deposition	-	
9/30/2009	13	Polysilicon	5	D5
10/7/2009	14	Wet etching	2	
10/12/2009	15	Surface micromachining	5	
10/14/2009		Bulk micromachining processes		
10/19/2009	16	Corner compensation and etch stop	4	PA
10/21/2009	17	Midterm	4	A6
10/26/2009	18	Vacuum physics and kinetic thoery		
10/28/2009	19	Plasma etching	2	D6,A7
11/2/2009	20	Deep RIE etching	2	
11/4/2009	21	Characterization Methods	8	D7,A8
11/9/2009	22	Wafer anodic bonding and local bonding	6	
11/11/2009	23	Stereolithography	6	D8,A9
11/16/2009	24	PDMS and SU-8 MEMS processing	-	
11/18/2009	25	Electroplating metals	-	
11/23/2009	26	MEMS/NEMS Sensors	6	D9,A10
11/25/2009	27	Microcantilever Fabrication Processes	10	
11/30/2009	28	Student presentations	10	D10
12/2/2009	29	Student presentations	-	
12/7/2009		Final Exam		PD
		Project - critical review of MEMS processing		
	Lab	LABORATORY EXPERIMENTS FOR MEMS CLASS		
	1	Lab safety and clean room protocol and wafer cleaning		
	2	Parylene deposition/PDMS molding		
	3	CAD and Mask Making		
	4	Electroplating		
	5	Photolithography		
	5	Silica Etching and Bulk Silicon Micromachining		
	6	Characterization Methods		
	7	Aluminum deposition		

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