

TO: The Engineering Faculty

FROM: The Faculty of the School of Mechanical Engineering

RE: Cross-Listing Approval of ME 558/ECE 557 Integrated Circuit/MEMS Fabrication Laboratory.

The Faculty of the School of Mechanical Engineering has approved the cross listing of the following course for a permanent course number. This action is now submitted to the Engineering Faculty with a recommendation for approval.

ME 558/ECE 557 Integrated Circuit/MEMS Fabrication Laboratory

Sem. 1 and 2, Class 3, cr. 3.

Prerequisite: Basic knowledge of semiconductors or consent of instructor.

Limited registration.

Laboratory exercises in the fabrication and testing of silicon integrated circuits and MEMS devices. Two test chips are fabricated and tested, i.e. (i) diode test chip, and (ii) MOSFET test chip OR a MEMS switch test chip. Laboratory technique, the technology of integrated circuit and MEMS fabrication, and device characterization are emphasized. Computer simulation is performed with the projects.

Reason: ECE 557 Integrated Circuit/MEMS Fabrication Laboratory has been in existent for several semesters. The purpose of this EFD is to cross-list this course in the School of Mechanical Engineering under ME 558. There is considerable research in MEMS and integrated circuits occurring in Mechanical Engineering. Cross-listing this course both in ME and ECE would improve student awareness of this course in both programs and promote collaboration between ME and ECE faculty both in teaching and research. Unfortunately the course number ME 557 is in use so ME 558 was selected, as the next closest course number to ECE 557.

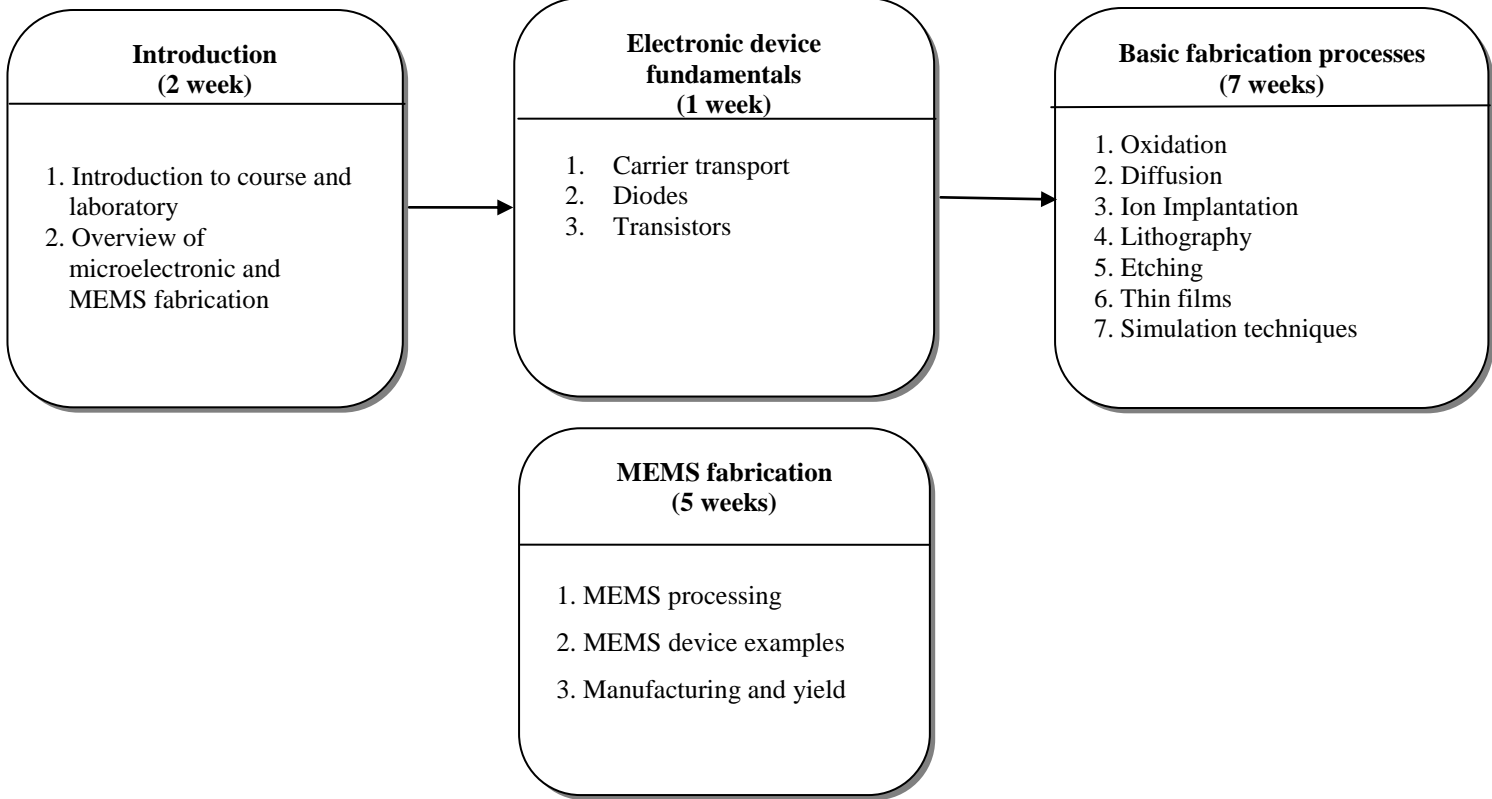
Details of the course are provided below in the two-page course profile.


James D. Jones, Associate Head/Professor
School of Mechanical Engineering

ME 558/ECE 557
Integrated Circuit/MEMS Fabrication Laboratory

Course Outcomes

1. To develop a sound *understanding* of fundamental microelectronic and MEMS fabrication techniques currently used in research and industry.
2. To learn *electronic device* fundamentals.
3. To obtain *hands on experience of microfabrication* in a cleanroom environment.
4. To learn the *fabrication and testing of basic microelectronic and micromechanical devices*.



COURSE NUMBER: ME 558/ ECE 557	COURSE TITLE: Integrated Circuit/MEMS Fabrication Laboratory
REQUIRED COURSE OR ELECTIVE COURSE: Elective	TERMS OFFERED: Fall & Spring
TEXTBOOK/REQUIRED MATERIAL: <i>The Science and Engineering of Microelectronic Fabrication</i> , 2nd Edition, S.A. Campbell, Oxford University Press	PRE-REQUISITES: Basic knowledge of semiconductors or consent of instructor. Limited registration.
COORDINATING FACULTY: C. Savran (currently taught by D. Janes ECE)	COURSE OUTCOMES: To give students practical experience of microelectronic fabrication: techniques used to fabricate numerous microelectronic and micromechanical devices. 1. To develop a sound <i>understanding</i> of fundamental microelectronic and MEMS fabrication techniques currently used in research and industry. 2. To learn <i>electronic device</i> fundamentals. 3. To obtain <i>hands on experience of microfabrication</i> in a cleanroom environment. 4. To learn the <i>fabrication and testing of basic microelectronic and micromechanical devices</i> .
COURSE DESCRIPTION Laboratory exercises in the fabrication and testing of silicon integrated circuits and MEMS devices. Two test chips are fabricated and tested, i.e. (i) diode test chip, and (ii) MOSFET test chip OR a MEMS switch test chip. Laboratory technique, the technology of integrated circuit and MEMS fabrication, and device characterization are emphasized. Computer simulation is performed with the projects.	
ASSESSMENTS TOOLS: Homework (5%), Laboratory notebook (20%), Laboratory Performance (15%), Project report (40%), Final exam (20%)	
PROFESSIONAL COMPONENT: 1. Engineering Topics: Engineering Science – 3 credit (100%)	
NATURE OF DESIGN CONTENT:	
COMPUTER USAGE: Required for homework problems and design projects. Matlab experience is useful.	RELATED ME PROGRAM OUTCOMES: N/A
COURSE STRUCTURE/SCHEDULE: 1. Lecture – 1 hour per week. 2. Laboratory- 5 hours per week.	
PREPARED BY: C. Savran (Based on the existing ECE 557: D. Janes)	REVISION DATE: November 28, 2007