

Appendix A.
College of Engineering Semiconductor Manufacturing minor curriculum plan

Semiconductor Manufacturing Undergraduate Minor
Materials Science and Engineering
College of Engineering
University of Arizona

General requirements:

18 Credits – (minimum of) 9 upper division credits required.

Students are assumed to have successfully completed foundational, freshman-level coursework consistent with major program requirements.

Required courses (9 credits): three “anchor” courses

1. *one required anchor course from the following:*

Chem 152 (4) – Chemical Thinking II

Prerequisites: CHEM 151 or 141/143 or 161/163 and 1 of the following: PPL 60+ or SAT I MSS 610+ or ACT MATH 26+ or one course from MATH 108, 112, 113, 119A, 120R, 122B, 125, 129, or 223. Test scores expire after 2 years.

or

Chem 142 (3)– General Chemistry Lecture II: Quantitative Approach and

Prerequisites: CHEM 151 or 141 or 161 and 1 of the following: PPL 60+ or SAT I MSS 610+ or ACT MATH 26+ or 1 course from MATH 108, 112, 113, 119A, 120R, 122B, 125, 129, or 223. Test scores expire after 2 years.

Chem 144 (1) - General Chemistry Lab II: Quantitative

Prerequisites: CHEM 151 or 141/143 or 161/163. Concurrent enrollment or completion of CHEM 142 and 1 of the following: PPL 60+ or SAT I MSS 610+ or ACT MATH 26+ or one course from MATH 108, 112, 113, 119A, 120R, 122B, 125, 129, or 223. Test scores expire after 2 yrs.

or

Chem 162 (3)– Honors Chemical Thinking II and

Prerequisites: CHEM 161 or department consent. Student must be active in the Honors College.

Chem 164 (1)– Honors Fundamental Techniques of Chemistry

Prerequisites: CHEM 161 and CHEM 163 or department consent. Concurrent enrollment or completion CHEM 162. Honors active.

or

MSE 110 (4): Introduction to Solid State Chemistry

Prerequisite: Chem 151

2. *Select two anchor courses from the following:*

MSE 365 (3): Physical Properties of Materials

Prerequisites: MSE 222 or MSE 223R or concurrent enrollment in OPTI 240 or department consent.

MSE 446 (3): Semiconductor processing

Prerequisite: Advanced Standing in Engineering

CHEE 415 (3): Microelectronics Manufacturing and the Environment

Prerequisites: Advanced Standing in Engineering

ECE 352 (3): Device Electronics

Prerequisite: Major: ECE. Prerequisite or concurrent enrollment in ECE 351C.

Course Attribute

Special Exam Credit Only

ECE 304A (3): Design of Electronic Circuits

Prerequisites: Advanced Standing: Engineering. Major: ECE. ECE 320A.

3. Electives (9 credits): choose from the following course listing (can double count from major degree electives as allowed by CoE and department program requirements)

ECE 351C (4): Electronic Circuits

Prerequisite: Advanced Standing: Engineering. Major: ECE. ECE 320A.

MSE/ECE 404/504 (3): Optical Spectroscopy of Materials

Prerequisites: PHYS 141 or PHYS 241, MATH 223, MSE 110, and ECE 360.

ECE 407 (3): Digital VLSI System Design

Prerequisites: Advanced Standing: Engineering. Major: ECE. ECE 274A and ECE 351C.

ECE/OPTI 414A (3): Photovoltaic Solar Energy Systems

Prerequisite: Advanced Standing in Engineering.

MSE/CHEE 432 (3): Organic Electronic Materials and Devices

Prerequisites: CHEM 151 or CHEM 141/143 or CHEM 161/163. MSE 110 or CHEM 152. MSE 365 or PHYS 371 or CHEM 480B

MSE/ECE 434 (3): Electrical and Optical Properties of Materials

Prerequisites: Phys 241

MSE/ECE 447/547 (2): Semiconductor Processing Laboratory

Prerequisites: Background in semiconductor/MEMS processing or equivalent work experience.

ECE 450 (3): Analog Integrated Circuits

Prerequisites: Advanced Standing: Engineering. Major: ECE. ECE 351C.

ECE 451A (3): Introduction to Physical Electronics

Prerequisites: Advanced Standing: Engineering. Major: ECE. ECE 381A.

ECE 456 (3): Optoelectronics

Prerequisites: Advanced Standing: Engineering. Major: ECE. ECE 381A.

MSE/ECE 465 (3): Microelectronic Packaging Materials

Prerequisites: Advanced Standing in Engineering

MSE 480 (3): Advanced Characterization Methods in MSE

Prerequisites: Advanced Standing in Engineering

MSE 488 (3): Scanning Electron Microscopy

Prerequisites: Advanced Standing in Engineering

MSE 489 (3): Transmission Electron Microscopy

Prerequisites: Advanced Standing in Engineering

SIE 305 (3): Introduction to Engineering Probability and Statistics

Prerequisites: Advanced standing and completion of MATH 129

SIE 408 (3): Reliability Engineering

Prerequisites: Advanced Standing and SIE 305

SIE 406 (3): Quality Engineering

Prerequisites: Advanced Standing and SIE 305

SIE 430 (3): Engineering Statistics

Prerequisites: Advanced Standing and SIE 305

SIE 465 (3): Supply Chain Management

Prerequisites: Advanced Standing and SIE 305, SIE 340

SIE 482 (3): Lean Engineering

Prerequisites: Advanced Standing and SIE 305

SIE 483 (3): Computer-Integrated Manufacturing Systems

Prerequisites: Advanced Standing and SIE 383