SEMICONDUCTOR MATERIALS & DEVICES CERTIFICATE

Requirements

The Certificate will consist of 20 credit hours of which 12 credit hours will be required courses. Students taking solid state/material science minor cannot take this certificate.

Required Courses

Courses below may have additional prerequisites.

1. PH 405 Semiconductor Materials & Applications or PH 505 Semiconductor Materials & Devices I
2. NE 406 Semiconductor Devices & Fabrication or NE 506 Semiconductor Devices & Fabrication
3. MDS 437
   or MDS 537 or CHE 540 Advanced Process Control

Electives

Code	Title	Hours
OE 450	Laser Systems & Applications	4
OE 585	Electro Optics & Applications	4
NE 330	Material Failure	4
PH 401	Introduction to Quantum Mechanics	4
PH 440	X-rays & Crystalline Materials	4
NE 408	Microsensors and Actuators	4
or NE 508	Microsensors and Actuators	
MDS 439	Advanced topics in MEMS	4
or MDS 539	Advanced topics in MEMs	
ECE 351	Analog Electronics	4
ECE 551	Digital Integrated Circuit Design	4
ECE 552	Analog Integrated Circuit Design	4
ME 302	Heat Transfer	4
ME 328	Materials Engineering	4
ME 424	Mechanics of Composites	4
or ME 524	Mechanics of Composites	
CHE 315	Materials Science and Engineering	4
CHE 320	Fundamentals of Heat & Mass Transfer	4
CHE 340	Process Control	4
CHE 441	Polymer Engineering	4
CHEM 441	Inorganic Chemistry I	4
CHEM 451	Organic Structure Determination	4
MA 381	Introduction to Probability with Applications to Statistics	4
MA 487	Design of Experiments	4
EMGT E445	Quality Methods	4

Overall aim of the Certificate

A certificate holder will understand how semiconductor devices work, have practical experience in the main stages of device production, have practical experience in the more common forms of device testing and characterization, and have broad understanding of the mechanical and chemical properties of the material used.

A Certificate holder will be well suited for jobs requiring an understanding of semiconductor devices and their production. These jobs include not only those directly related to device fabrication, but also those involved with testing and trouble-shooting electronic equipment and the design of machines that contain electronic equipment. The experience in simple device fabrication that the Certificate provides is particularly useful for future engineers in “process” industries.