

Ph. D. in Engineering

Micro/Nanotechnology and Micro/Nanoelectronics Emphasis

Recommended Plan of Study

Required General Core Courses

Take all three of the following: (9 SCH)

ENGR 641	Formulation of Solutions to Engineering Problems
MATH 574	Numerical Solutions of PDE
STAT 505	Statistics for Engineering and Science

Micro/Nanotechnology Core Courses

Take all six of the following: (18 SCH)

MSE 501	Microsystems Principles
MSE 502/ELEN 437	Microfabrication Principles
MSE 503/ELEN 438	Microfabrication Applications & Device Fabrication
MSE 504	Advanced Materials for Micro/Nano Devices & Systems
MSE 505	Nanotechnology Principles
MSE 512	Biotechnology Principles

Elective courses

Choose seven of the following: (21 SCH)

ELEN 535	Advanced Topics in Microelectronics
MSE 507/ELEN 537	Advanced Microfabrication with CAD
MSE 508/ELEN 538	Advanced Microelectronic Devices with CAD
MSE 506	Micro/Nano Scale Materials Measurements & Analysis
MSE 557	Special Topics
MSE 609	Microsystems Analysis with CAD
MSE 610	Microsystems Design with CAD
BIEN 557	Special Topics – BioMEMS
BIEN 557	Special Topics – Protein Engineering
CHEM 502	Selected Topics in Organic Chem. - Principles of Polymers
CHEM 523	Nanofabrication by Self-Assembly
CMEN 513	Transport Phenomena
CMEN 557	Special Topics - Chemical Microsystems
ELEN 533	Optoelectronics
MEMT 511	Modern Engineering Materials
PHYS 512	Solid State Physics
ENGR 566	Quality in Engineering
ENGR 592	Engineering Computational Methods
ENGR 622	The Academic Enterprise
ENGR 631	Global Competitiveness and Management of Technology

Research and Dissertation

ENGR 651 18 hours of research and dissertation

Research and Dissertation

Total: 48 SCH of courses + 18 SCH of Research & Dissertation = 66 SCH.

Tentative course schedule for the first two years (assuming Fall as the first quarter):

Fall-1	Wtr-1	Spg-1	Sum-1	Fall-2	Wtr-2	Spg-2	Sum-2
MSE 501	MSE 502	MSE 503	An elective or	ENGR 641	STAT 505	MATH 574	An elective or
MSE 512	MSE 504	MSE 505	Indep. Study	Elective	Elective	Elective	Indep. Study
				Take disciplinary qualifying exam			Take general qualifying exam

The main goal of this plan is to give students the background necessary to become productive in research as early as possible. So, they are advised to complete the disciplinary core first.

This plan calls for the subject qualifying exam to be taken in the Fall of the second year, and the general qualifying exam to be taken in the second summer.

Students who do not start in the Fall quarter should take these qualifiers the first time they are offered after they have completed the necessary courses.