

Example Plan of Work
for
Nanoelectronics and Photonics Masters Students
Concentration in Photonics

Generic Recommendations:

Your undergraduate coursework should probably include a course in quantum mechanics or modern physics, a solid state course describing the device physics of a pn junction, a MOS-FET transistor, and lasers. A strong background in electromagnetic theory is also helpful. If you do not have this background, don't despair of a career in nanotechnology, but recognize that some catch up work and supplemental work may be needed.

The normal entry sequence is in the Fall semester of the academic year. Students transferring in the spring semester should get specific advice from their interim advisor. Specifically it may be useful to take PY 552, if ECE 730 is not offered.

In the nanoelectronics and photonics area a Masters with Thesis is preferred. For experimentalists this is due to the complexity of the equipment involved in the growth, fabrication and characterization of the semiconductor or nanostructured materials. It is very valuable to have hands on experience using the tools that can only be obtained by actively participating in research. For students with a more theoretical bent a thesis is encouraged to permit the in-depth analysis of specific problems of interest.

A detailed explanation of the rules can be found in the graduate handbook.

- 30 Hours of credit are required.
- 21 of the hours must be ECE courses (18 of these must be for credit)
 - 3 hours can be ECE 633 Independent study is graded S/U
 - For students with thesis up to 6 hrs of ECE 695 Masters Research graded S/U is allowed in addition to the 3 Hrs of ECE 633 if taken. (Total 9 hrs of S/U)
 - Non-thesis students do not get credit for ECE 695 hrs
- 9 hrs can be taken outside of the ECE department
 - These courses should be related to the degree and are usually taken in the Physics and Materials Engineering Department
 - Of these 9 hrs 1 course (3hrs) can be a 400 level course
- 6 courses should be taken in the EE major Track
 - ECE 695 can be counted as one of the six courses
- At Least Two courses should be Advanced Courses in the EE track
- 3 ECE courses should come from specialty areas outside of NEP

Masters with out Thesis Example Curriculum Focus on Photonics

1st Semester (Fall)

ECE 730	Physical Electronics (Required for all students)
ECE 738	Integrated Circuits and Fabrication
ECE 723	Optical properties of semiconductor materials (If Offered)
Or	
PY 516	Physical Optics
ECE 711	Analog Circuits

2nd Semester (Spring)

ECE 739	Integrated Circuits and Fabrication Laboratory
ECE 523	Photonic Devices and Optical Communications
ECE 740	Electromagnetic fields
Or	
ECE792F	Quantum Engineering

3rd Semester (Fall)

ECE 722	Electronic properties of solid state materials
ECE 792O	High Speed Photonics for Telecommunications (New, offered by Prof Lunardi)
ECE 723	Optical properties of semiconductor materials (If Offered)
Or	
PY 516	Physical Optics
ECE 711	Analog Circuits

4th Semester (spring)

ECE 724	Electronic properties of solid state devices
ECE 520	Digital ASIC Design
ECE 633	Independent study or elective

Recommended in Advance Graduate Courses (2 courses) are:

ECE 723	Optical properties of semiconductor materials
ECE 724	Electronic properties of solid state devices

Recommended Core Area Courses Are:

ECE 723
ECE 730
ECE 738
ECE 739

Recommended Courses outside NEP area:

ECE 740
ECE 711
ECE 520

Recommended courses outside department:

PY 516

Recommended Electives

PY 552	Intro Structure of Solids	ECE 792F	Nanometer Technology
ECE 792F	Quantum Engineering	Math 501	MAT 760

Masters student with thesis Focus on Photonics

1st Semester (Fall)

ECE 530	Physical Electronics (Required for all students)
ECE 738	Integrated Circuits and Fabrication
ECE 723	Optical properties of semiconductor materials (If Offered)
Or	
PY 516	Physical Optics
ECE 711	Analog Circuits

2nd Semester (Spring)

ECE 739	Integrated Circuits and Fabrication Laboratory
ECE 523	Photonic Devices and Optical Communications
ECE 740	Electromagnetic fields
Or	
ECE 792F	Quantum Engineering

3rd Semester (Fall)

ECE 722	Masters Research
ECE 792O	High Speed Photonics for Telecommunications (Leda's Proposed course)
ECE 723	Optical properties of semiconductor materials (If Offered)
Or	
PY 516	Physical Optics
ECE 711	Analog Circuits

4th Semester (spring)

ECE 724	Electronic properties of solid state devices
ECE 520	Digital ASIC Design
ECE 633	Masters Research

Recommended in Advance Graduate Courses (2 courses) are:

ECE 723	Optical properties of semiconductor materials
ECE 724	Electronic properties of solid state devices

Recommended Core Area Courses Are:

ECE 523	
ECE 530	
ECE 738	
ECE 739	
ECE 635	Masters Research

Recommended Courses outside NEP area:

ECE 740
ECE 711
ECE 520

Recommended courses outside department

PY 516

Recommended Electives

PY 552	Intro Structure of Solids	ECE 792F	Nanometer Technology
ECE 792F	Quantum Engineering	Math 501	
MAT 760			

* It may be convenient to take ECE 633 the 2nd semester, and perform masters research over the summer.