Ph. D. in Engineering  
Engineering Physics Track  
Recommended Plan of Study (09/2007)

Degree Codes: ES PhD ENGR  
Contact: Prof. Neven Simicevic

General Core Courses  
Take all three of the following: (9 SCH)  
- PHYS 510/ENGR 641 Mathematical Methods for Scientists and Engineers *(Fall)*  
- STAT 505 Statistics for Engineering and Science *(Winter)*  
- MATH 574 Numerical Solutions to PDEs *(Spring)*

Disciplinary (Physics) Core Courses  
Take all five of the following: (15 SCH)  
- PHYS 511 Electromagnetic Theory *(Spring)*  
- PHYS 512 Solid State Physics *(Fall)*  
- PHYS 521/MEEN 571 Theoretical Mechanics *(Winter)*  
- PHYS 522 Quantum Mechanics *(Spring)*  
- PHYS 533 Statistical Mechanics *(Winter)*

Qualifying Examinations  
- ENGR 685 Doctoral Qualifying Examination  
- ENGR 686 Oral Comprehensive Examination

Doctoral Seminar: 3 SCH  
All students are automatically enrolled in the Doctoral Seminar course (ENGR 610) each Fall quarter. 3 SCH of the seminar may be counted towards the degree.

Recommended Elective courses*  
(Students can take up to two Doctoral level Special Topics courses - either PHYS 557 or ENGR 657 - as part of the elective course work for the degree, for a total of 6 SCH.)

Choose seven of the following: (21 SCH)  
- BIEN 557 Special Topics – BioMEMS  
- BIEN 557 Special Topics – Protein Engineering  
- CHEM 502 Selected Topics in Organic Chemistry – Principles of Polymers  
- CHEM 523 Nanofabrication by Self-Assembly  
- ENGR 566 Quality in Engineering  
- ENGR 592 Engineering Computational Methods  
- ELEN 533 Optoelectronics  
- ELEN 535 Advanced Topics in Microelectronics  
- MATH 655 Mathematical Modeling  
- MEEN 549 Computational Fluid Dynamics  
- MEMT 508 Finite Element Methods

* Courses not listed are also acceptable, provided they are approved by the Advisory Committee.
MEMT 511  Modern Engineering Materials
MEMT 565  Continuum Mechanics
MSE  501  Microsystem Principles
MSE  502  Microfabrication Principles
MSE  503  Microfabrication Applications and Device Fabrication
MSE  504  Advanced Materials For Micro/Nano Devices And Systems
MSE  505  Nanotechnology Principles
MSE  506  Micro/Nano Scale Materials, Measurements, and Analysis
PHYS 515  Detectors for Particle & Nuclear Physics (proposed)
PHYS 523  Classical Theory of Fields
PHYS 524  Quantum Theory of Fields
PHYS 531  Theories of Physics I
PHYS 532  Theories of Physics II
PHYS 540  Computational Methods in Physics Modeling and Simulation I
PHYS 541  Computational Methods in Physics Modeling and Simulation II

Research and Dissertation  18 hours of research and dissertation

PHYS 651(prop.)/ENGR 651 Research and Dissertation

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

Research and Dissertation  Minimum 18 hours (ENGR 651).
  3, 6 or 9 hours per quarter. Maximum total allowed is 30 hours.

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